Quanta Hardware

Instruction Manual

Version 2.01

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Section 1

How Do I...?

1.0 Section Overview: This section gives step-by-step instructions on how to perform common **Quanta 1000** changes/maintenance tasks. To obtain the maximum benefit from this section, you should actually perform the operations as you read them. We also recommend that you read Sections 2 and 4 before attempting any of these procedures. **Refer to Section 4 for more detail on specific operations.** Section 1 will answer the following questions:

- How do I change the time the lights go out? (Section 1.3)
- How do I change a holiday date? (Section 1.4)
- How do I add a relay output to a switch group? (Section 1.5)
- How do I check the status of the relay outputs? Section 1.2)
- Nothing seems to work! How do I get the lights ON or OFF? (Section 1.1)

1.1 If Nothing Seems To Work -

1. Locate the ON and OFF override switches. There is an ON and an OFF switch for each relay. The switches are located on the controller I/O board(s) and are independent of the microprocessor. (See Figure 1-1.)

2. Push each relay's ON or OFF switch to set the relay to the desired state.

3. Verify that the line side of the lighting relays are powered.

4. Verify that the controller is programmed by viewing the switch input and timer programming.

5. Turn the power switch located on the CPU board OFF for 15 seconds and then turn the power back ON.

6. Still not working? Call 612-829-1900 for ILC applications support. Please have a phone by the controller for a step-by-step analysis.

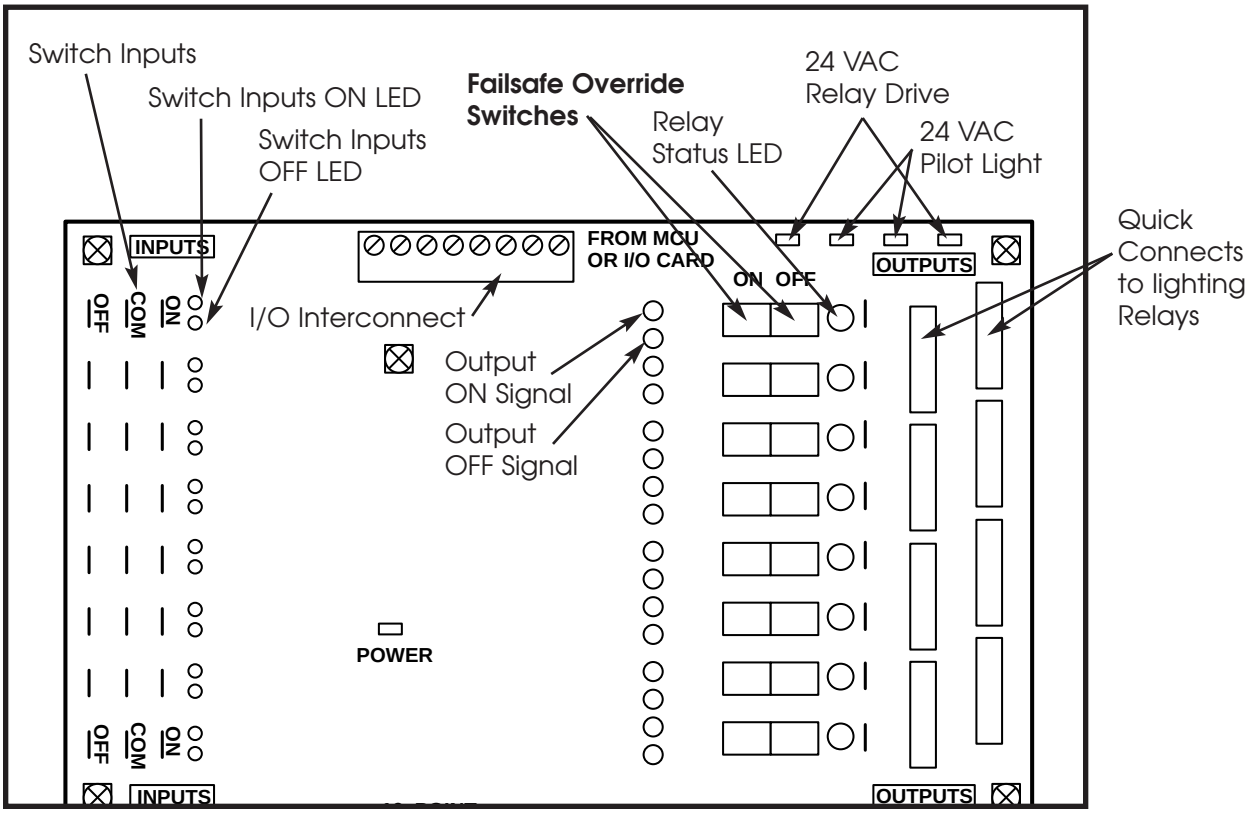


Figure 1-1 Override Switches On I/O Board

1.2 To Check The Status Of A Relay Output -

1. From the **Home Screen** (the one that displays the date and time), press the yellow **SWITCH TYPE** and **INPUT** ↓ keys at the same time.

2. Press either the green **OUTPUT** ↓ or green **OUTPUT** ↑ to scroll through the outputs and check each output's status. If you want to force an output to a particular state, scroll to the output then press the yellow **INPUT** ↑ key to drive the output ON or **INPUT** ↓ to force the output OFF.

3. When you are finished, press **QUIT** or let the controller time out and return to the **Home Screen**.

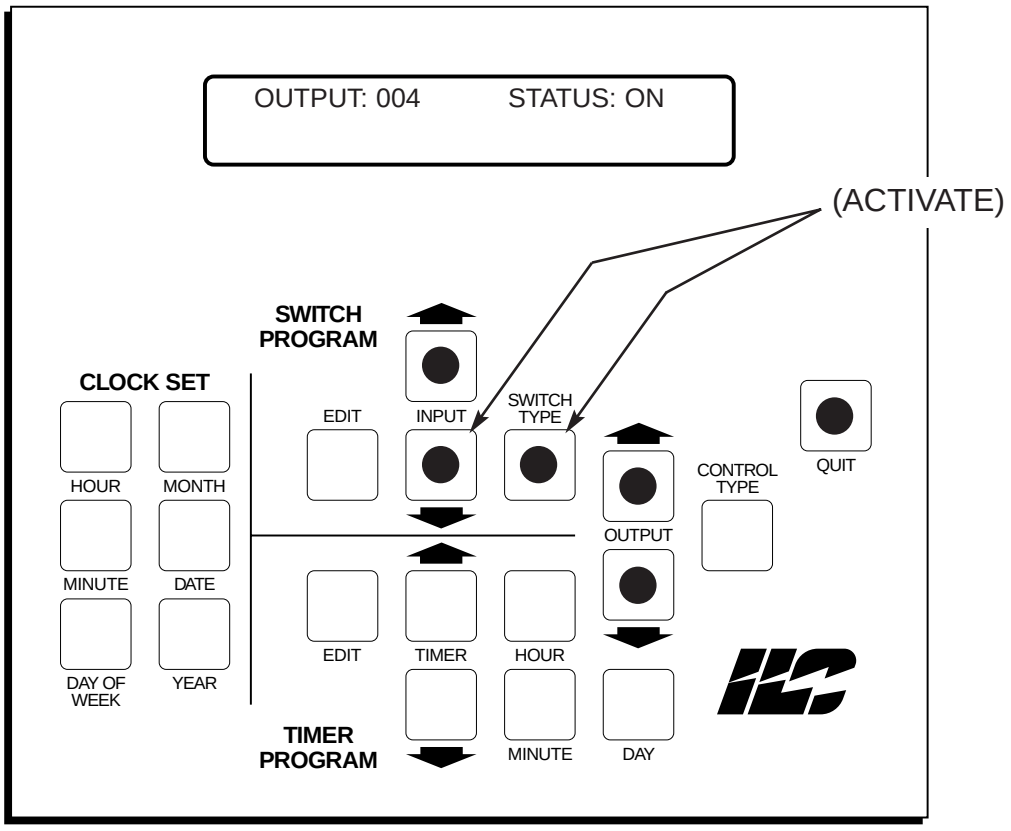


Figure 1-2 Relay Status

1.3 To Change The Time The Lights Go Out -

1. Consult the **Controller Timer Worksheet** and pick the Timer you want to change.

2. From the **Home Screen** (the screen that displays the date and time), press the blue **EDIT** key (in the Timer section of the keypad).

3. Press **Timer**↓ until you have located the timer to be changed.

4. Press the blue **HOUR** and **MINUTE** keys as required to adjust when the controller will invoke the timer.

5. Press **QUIT** or let the controller time out and return to the **Home Screen**.

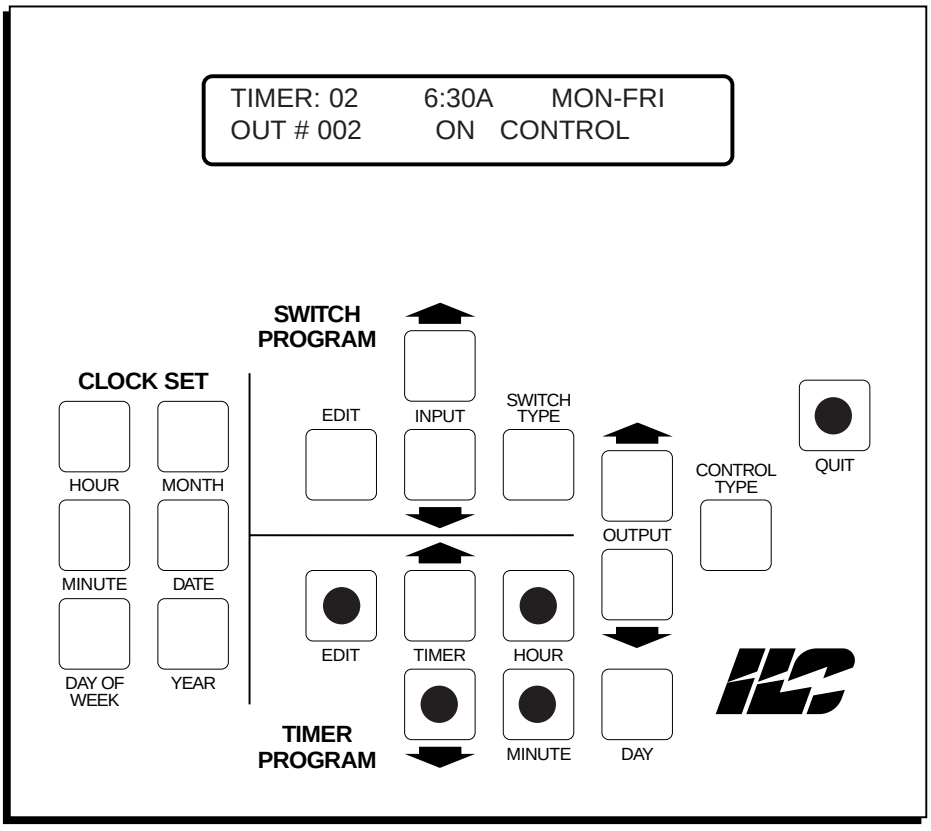


Figure 1-3 Timer Editing

1.4 To Change A Holiday Date -

1. Consult the **Controller Holiday Worksheet** and pick the holiday whose date you want to change.

2. From the **Home Screen** (the one that displays the date and time), press the blue **TIMER**↓and the blue **DAY** keys simultaneously.

3. Press the green **OUTPUT**↓ key to access the holiday you want to change.

4. Press the tan **MONTH** and **DATE** keys as needed to set the new Holiday date.

5. Press **QUIT** or let the controller time out and return to the **Home Screen**.

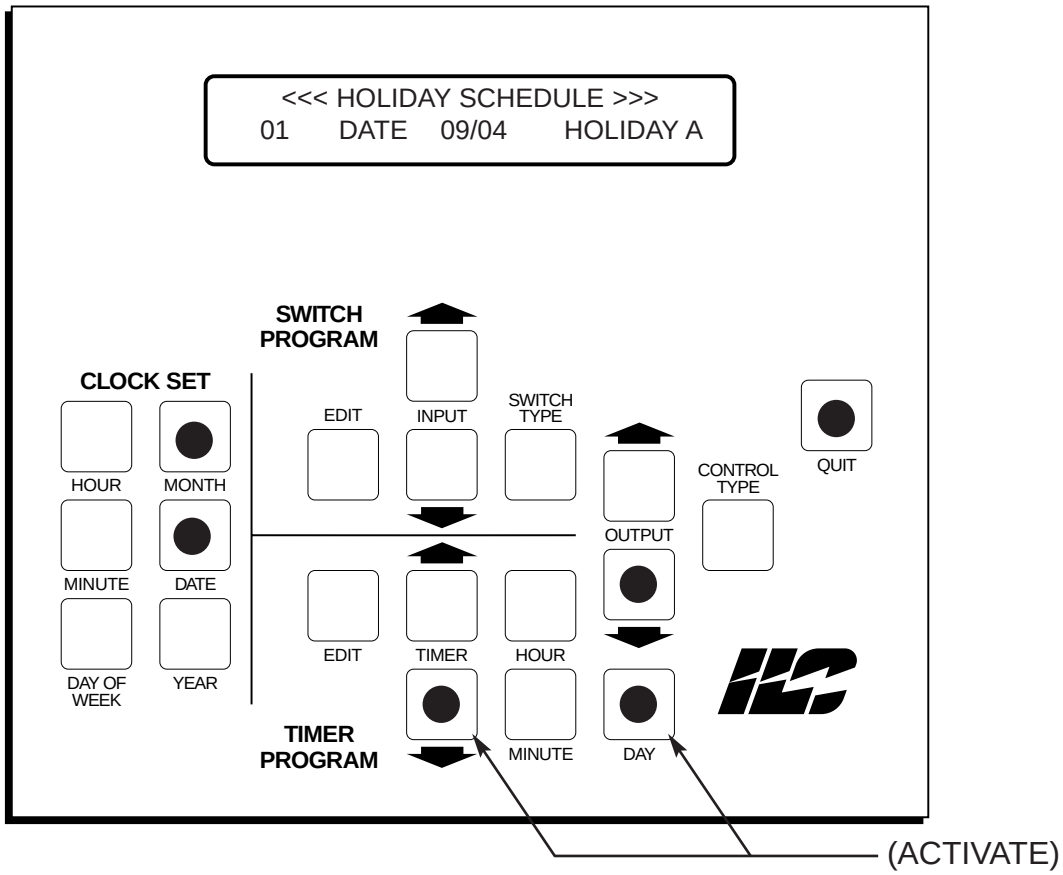


Figure 1-4 Editing Holidays

1.5 To Add A Relay Output To A Switch Group -

1. Consult the **Controller Switch Input Worksheet** and pick the Input # you want to add the relay output to.

2. From the **Home Screen** (the one that displays the date and time), press the yellow **EDIT** key.

3. Press the yellow **INPUT**↓ key until you have scrolled to the desired Input.

4. Press the green **OUTPUT**↓ key until you have selected the output to be added to the switch group.

5. Press the green **CONTROL TYPE** key to select how you want the added output to react to the switch signal.

6. Press **QUIT** or let the controller time out and return to the **Home Screen**.

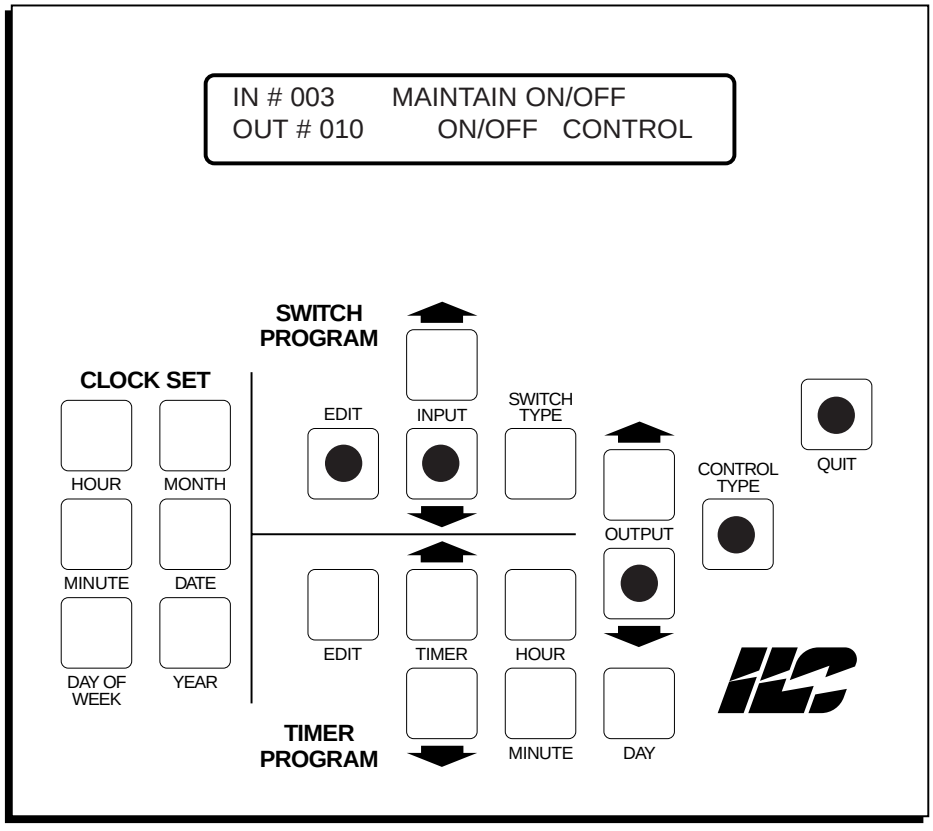


Figure 1-5 Editing A Switch Group

Notes

Section 2

System Description

2.0 Section Overview: The **Quanta 1000** is a microprocessor-based lighting controller. You can program the **Quanta 1000** to control lighting relays in response to switch signals sensed by its inputs and/or by time-based scheduling. The **Quanta 1000** is UL approved and FCC certified for both commercial and residential applications.This section covers the following:

- **Quanta 1000** system architecture and capacity
- System Features
- Control and application concepts

2.1 Controller Architecture - The major components comprising the controller are: (Figure 2-1.)

- enclosure
- transformer(s)
- CPU board
- I/O board
- programming module
- lighting relays

2.1.1 Enclosures - The enclosure is rated NEMA 1. It is divided into a line voltage section housing the line voltage side of the transformer(s) and lighting relays and a low voltage section containing the Class 2 side of the lighting relays, transformer secondaries, and electronic components. Enclosures are available in 4 sizes to accommodate 8, 16, 24, 32, 40 and 48 inputs, outputs, and lighting relays. The 8 relay enclosure is 15" (w) x 18" (h) x 4" (d). The remaining three sizes are all 6 inches deep. The 16 relay size is 24" (w) x 24" (h). The 24/32 relay size measures 24" (w) x 30" (h) and the 40/48 relay size is 30" (w) x 48" (h). The **Quanta 1000** is shipped to the job-site as a complete assembly.

2.1.2 Transformer(s) - A 40 VA control transformer (120 or 277/24 vAC provides the 24 vAC input to power the controller electronics. A second 40 VA 120 or 277/24 vAC transformer provides class 2 switching power to the lighting relays and the **relay output status LEDs** which display the ON/OFF status of each lighting relay and to any field installed pilot light switches.

2.1.3 CPU Board - (See Figures 2-2a and 2-2b.) The CPU board provides the controller's intelligence and memory. Major components include:

- **the power supply**, which converts the 24 vAC input to the +5, -5 and +12 vDC required by the controller logic and communications circuits. A **power switch** provides the means of energizing/de-energizing all controller electronics.

- **the Micro-processor** – executes the computer code and coordinates all controller functions including the controller **real time clock**.

- **the PROM chip** – contains the controller operating system and basic tasks.

- **the static RAM chips** – store the user-entered operating parameters and also feature an internal back-up battery to protect data during power failures.

- **the "super cap"** – keeps the controller real time clock functioning during power failures.

- **the on-board modem** – this 1200 baud modem allows for remote programming of the controller. This is the **standard** communications interface for the **Quanta 1000** controller.

- **RS485/RS232 Port** – If you order the **RSX option** equipped Quanta 1000, this replaces the on board modem (Figure 2-2b. If configured for RS232 communications it supports programming of the controller via a personal computer equipped with ILC programming software. If configured for RS485 communication, this supports the networking of up to 128 controllers via a 2 wire communications bus. See Section 5 for greater detail.)

- **DTMF Interface** – On **RSX** equipped controllers, this device supports touch tone phone ON/OFF control of either individual lighting relays or of all the relays in the controller. See Section 6 for detail.

2.1.4 I/O Board(s) – See Figure 3. This board provides the electronic interface between the switch input/timing signals and the lighting relays. The 8 relay controllers are equipped with a single board which contains eight (8) switch inputs and (8) relay outputs. The 16, 24, 32, 40, and 48 relay enclosures are equipped with I/O boards each containing 16 switch inputs and 16 relay outputs. The 16 relay enclosure can house one of these boards, the 32 relay enclosure two and the 48 relay enclosure three.

- **Switch inputs** – can accept input from either two or three 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 20 gauge wire is used. See Table 2-1 for available options.

- **Relay Outputs** – each output controls its associated lighting relay ON and OFF. Each output has two associated LEDs. The **ON** LED momentarily blinks when the output switches the relay ON. The **OFF** LED momentarily blinks when the output switches the relay OFF. The outputs are noise and surge resistant. (A lighting relay may be mounted up to 2000 feet from the controller if 18 AWG wire is used.)

- **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 even if the controller electronics are inactive.

2.1.5 Programming Module – (See Figure 4.) The programming module provides for user access to the controller. It consists of a tactile response keypad and a two line 24 characters per line LCD display integral to **Quanta 1000** controller or a portable device temporarily connected to a programming port on the CPU board (See Figure 2-4.) Each **Quanta 1000** controller can also be programmed via its 1200 baud modem port (or on RSX options via the RS485/RS232 port).

2.1.6 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 circuit of each relay is terminated to a relay output on the controller I/O board (See Figure 2-3.) Each relay output controls **only one** lighting relay. Generally, the lighting relays are resident in each controller; however, they may be remote mounted, using 20 gauge wire, up to 2000 feet from the controller, if required by job site application.

2.1.7 Controller Capacity – Each **Quanta 1000** can control up to **128 switched input and 128 relay outputs and lighting relays**. If the required number of switch inputs, relay outputs and lighting relays exceeds the quantity that can be housed in the controller enclosure, or if the circuits controlled by the lighting relays are in locations remote from each other, the additional I/O points and relays can be housed in **ILC-128 Expansion Panels** (See Figure 2-5.) The expansion panels come in 16, 24, 32, 40 and 48 capacities. All enclosure sizes are six (6) inches deep. The 16 relay size is 24" (w) x 24" (h) The 24/32 relay size is 24" (w) x 30" (h). The 40/48 relay enclosure is 30" (w) x 48" (h). The controller enclosures house only I/O board(s) and lighting relays which are controlled from the microprocessor board resident in the **Quanta 1000**. The **Quanta 1000** and the **ILC-128** expansion panels are linked by 24 gauge, 8 conductor shielded cable. The following guide must be observed:

- there can be no more than **128 switch inputs & 128 relay outputs**.
- the distance between any two panels must not exceed **200 feet**.
- the total length from the first to the last panel must not exceed **500 feet**.

2.1.8 System Capacity – Up to 128 **Quanta 1000** controllers equipped with the RSX options can be linked on a 2 wire RS485 bus. See Section 6 for details.

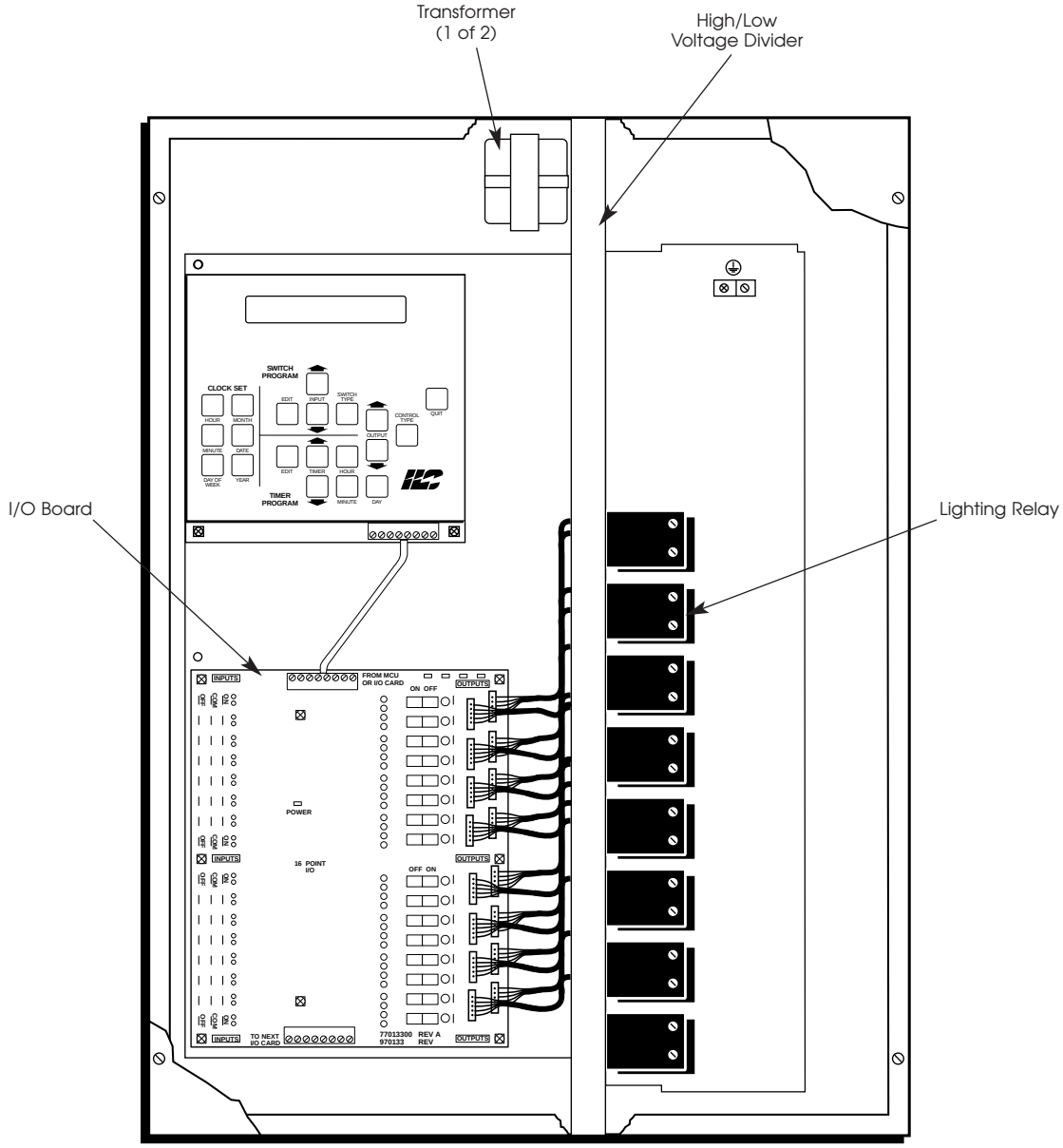


Figure 2-1, Quanta 1000 Relay Controller

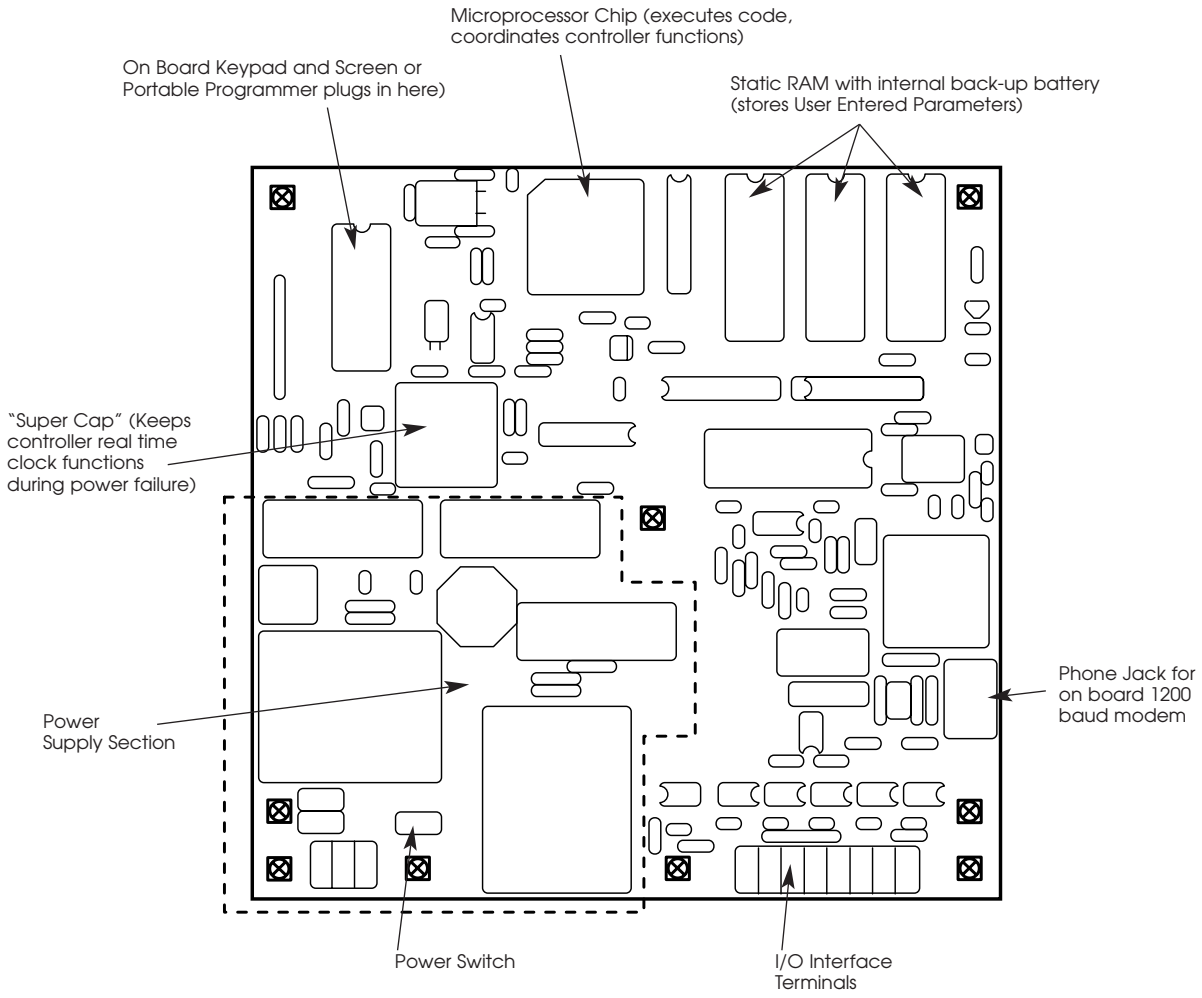


Figure 2-2a, CPU Board Detail (Base Unit)

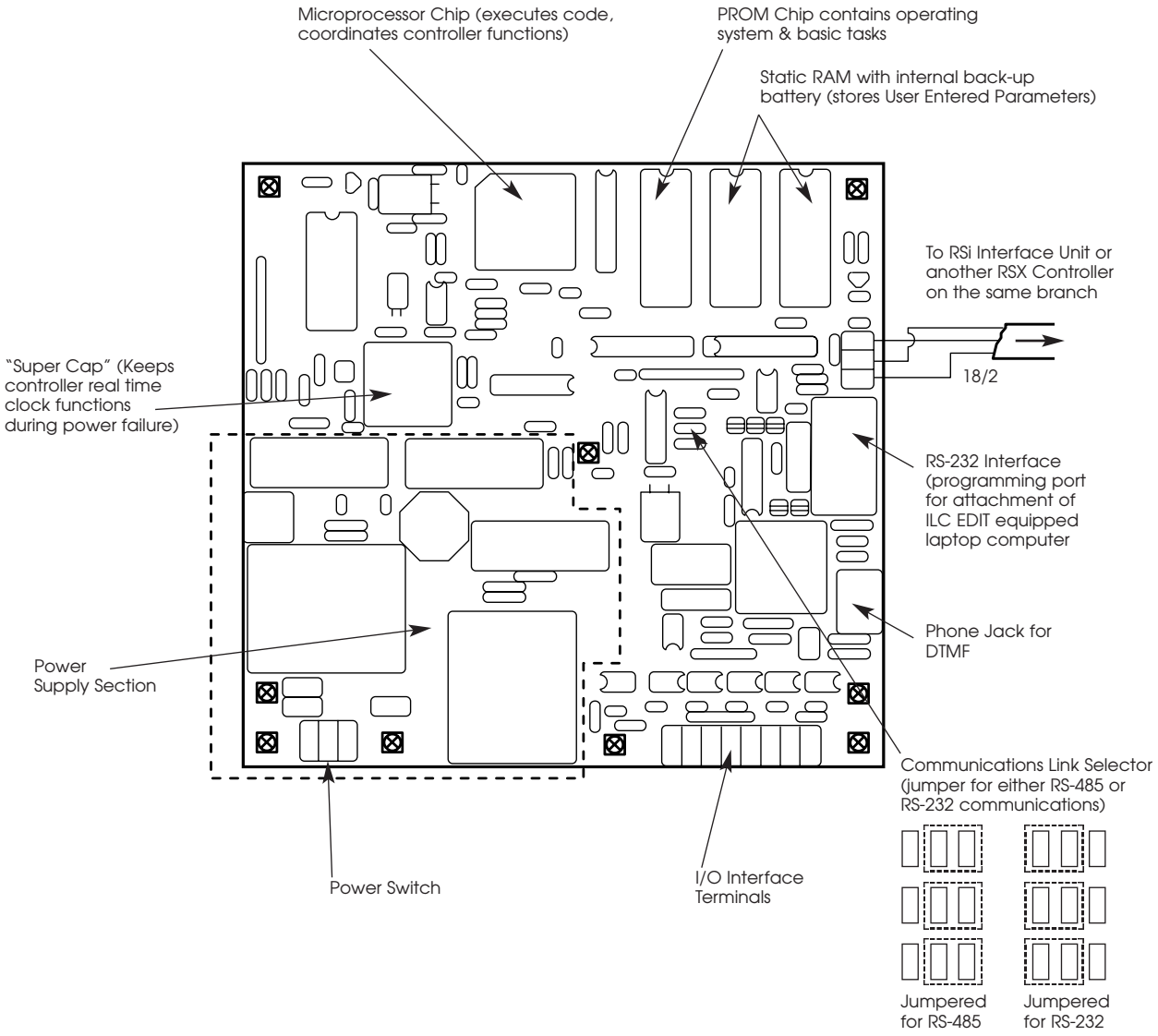
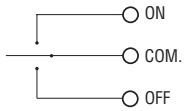
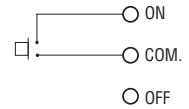


Figure 2-2b, CPU Board Detail (RSX Unit)

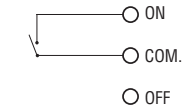
Switch Input Types



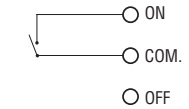
Momentary ON/OFF:
The controlled outputs turn OFF when Common & OFF contacts are momentarily made. The controlled outputs turn ON when Common & ON contacts are momentarily made.



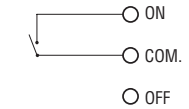
Momentary Pushbutton:
The input turns the controlled outputs to the opposite state each time the switch contacts are momentarily made.



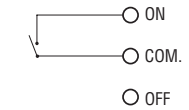
Maintained ON/OFF:
When the input senses a closure it turns the controlled outputs ON. When the input senses an open, the controlled outputs are turned OFF.



Maintained Multi-way:
The controlled outputs toggle each time the input senses a change of state. Function is similar to line voltage 3 and 4 way switching.



Timer Override:
As long as the switch is turned ON, relay output(s) controlled by this switch will ignore any timers that they have been programmed to respond to.



Timed ON:
When the switch is activated, the relay outputs assigned to it will turn ON for a selectable period of time. Five minutes before the specified ON time is to expire, the controller blinks the relay outputs as a warning. At this point the switch can be activated again and the relay outputs will turn ON for the programmed time period.

Switch Input Notes

1. Switch can be located up to 1500 feet from I/O board if minimum of 20 guage wire is used.
2. When parallel switching, momentary switches can be terminated to the same input. But there must be a separate input used for each maintained switch.

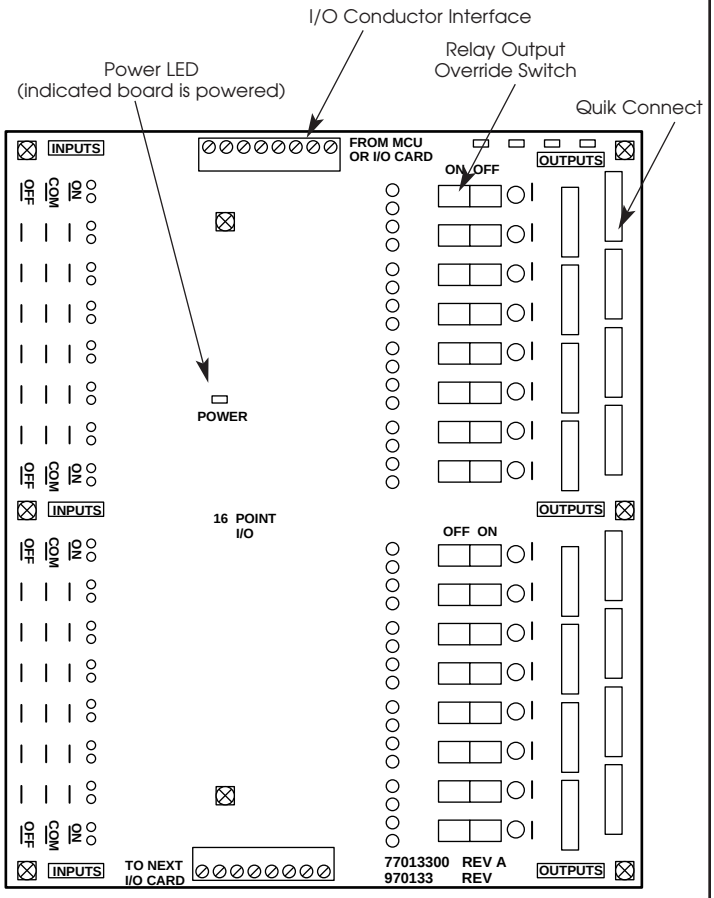


Figure 2-3, I/O Board Detail

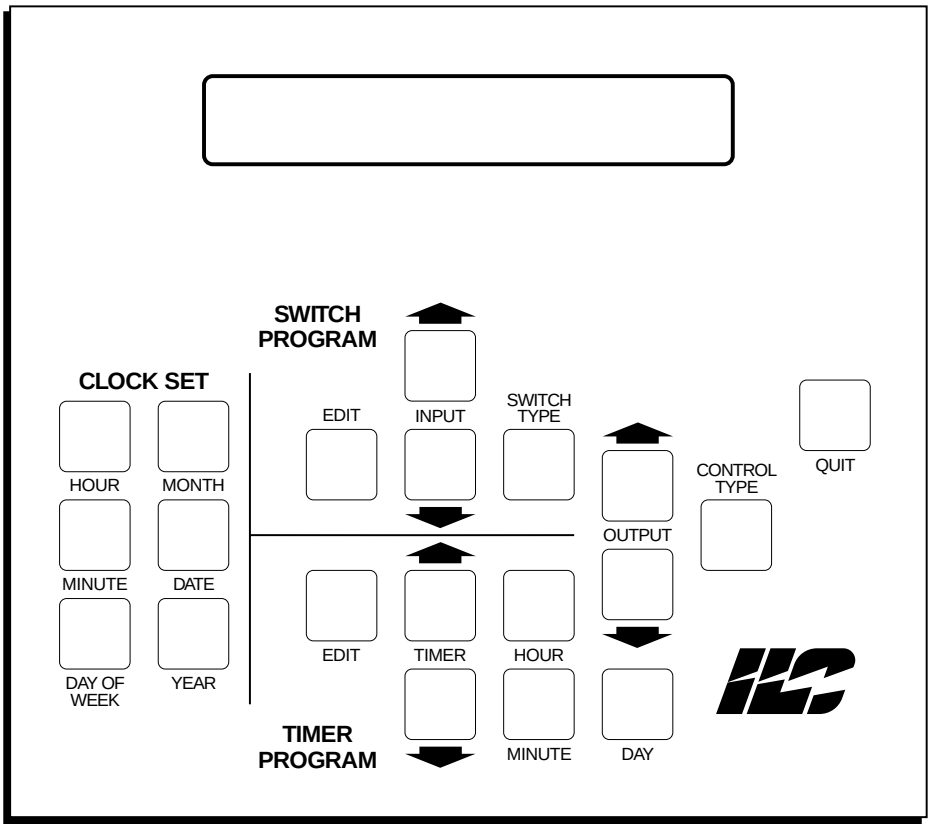
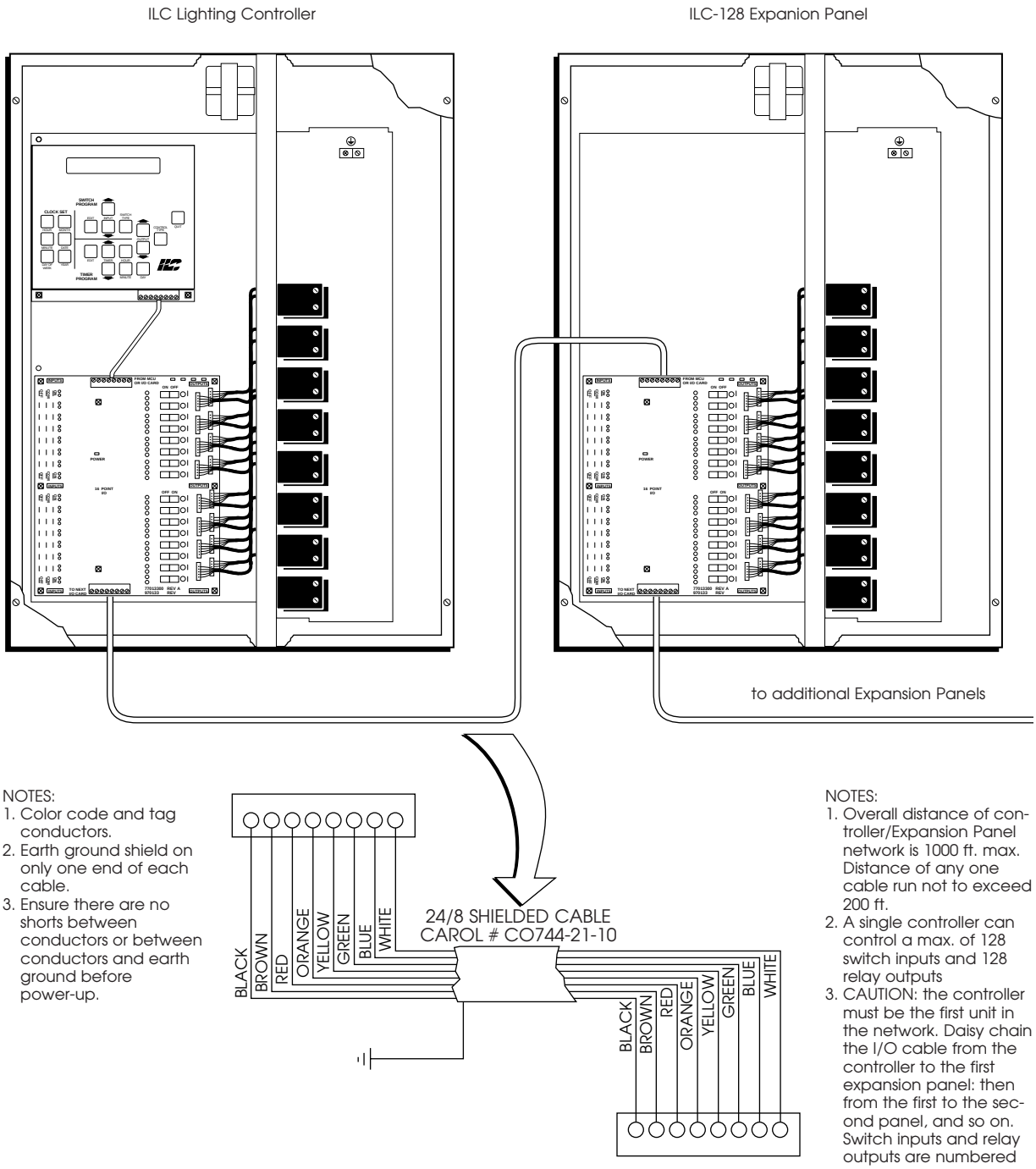


Figure 2-4, Programming Module Detail



NOTES:
1. Color code and tag conductors.
2. Earth ground shield on only one end of each cable.
3. Ensure there are no shorts between conductors or between conductors and earth ground before power-up.

NOTES:
1. Overall distance of controller/Expansion Panel network is 1000 ft. max. Distance of any one cable run not to exceed 200 ft.
2. A single controller can control a max. of 128 switch inputs and 128 relay outputs
3. CAUTION: the controller must be the first unit in the network. Daisy chain the I/O cable from the controller to the first expansion panel: then from the first to the second panel, and so on. Switch inputs and relay outputs are numbered in ascending order beginning with the first input and output on the first I/O board in the controller.

Figure 2-5, Quanta 1000-ILC-128 Link

2.2 System Features – The **Quanta 1000** allows you to:

- Control relays by programming outputs to respond to switch closures sensed on the controller switch inputs.
- Control relays by programming outputs to respond to internal timers so as to follow a time of day schedule and program a blink alert to warn of an impending OFF timer.
- Define holiday schedules. On a holiday, the controller will substitute a special set of timers you have defined instead of using the timers normally invoked for day of the week control.
- Monitor the run time of each relay output and the number of ON/OFF cycles.
- Select the state the relays will assume when power is applied to the controller.
- Control relays via touch tone telephone commands (on **RSX** equipped controllers only).

The controller also:

- **automatically** saves entered data in real time.
- implements a 50 msec stagger time between each relay output simultaneously impacted by ON/OFF control signals.

2.2.1 Switch Control – When you program switches, you "software patch" switch inputs to relay output(s). Since there is no hardwired connection between the switch inputs and relay outputs, you have unlimited flexibility in selecting the relay outputs you wish to respond to a given switch input. You can program a switch input to control one, all, or any number of relay outputs. You can also program relay outputs to respond to one, several, or all of the switch inputs. If you change your mind you can re-program the controller to re-define the switching control.

2.2.2 Switch Types – You can program each switch input as one of seven different switch types. The type you select depends on your particular application and on the hardware characteristics of the switch or switch equivalent (photocell contact, BAS system channel, etc.) used on the project site. See Table 2-1 for an explanation of the different switch types.

2.2.3 Control Types – You can program the relay outputs to respond to the switch signal in one of the following manners:

- **ON/OFF** – The relay output(s) will turn ON and OFF as the switch input senses closures and openings across its input terminals.
- **ON only** – The relay output(s) turn ON but **NOT** OFF in response to switch input signals.
- **OFF only** – The relay output(s) turn OFF but **NOT** ON in response to switch input signals.
- **OFF With Blink Alert** – See 2.2.6 for details.

2.2.4 Time Based Scheduling – The controller supports 32 timers (events) for use in developing time of day scheduling. A timer is an ON or OFF signal generated by the controller which turns affected outputs ON or OFF at a specific time of day. Any or all of the 32 timers can be assigned to implement a control schedule on one or more days of the week. Each of the 32 timers instead of being assigned a time of day (12:30 PM etc.) may be assigned a time relative to sunrise/sunset (**Astro-Time**). The choices are: one hour before sunrise, sunrise, one hour after sunrise, one hour before sunset, sunset, one hour after sunset. **The controllers feature automatic daylight saving and leap year adjustment.**

2.2.5 Holidays – Any or all of the 32 timers can be assigned to any of 32 holidays. The controller will automatically substitute the holiday timers for the normal day of the week timers at the appropriate date. The holiday can be programmed as a full or half-day period. Individual timers may be programmed to **ignore** Holidays or execute as normal.

2.2.6 Blink Alert – Five minutes before invoking an OFF timer, the controller can be programmed to blink the lights twice. An **ON signal** from a switch controlling the lighting relays postpones implementation of the **off timer** for **two hours**. Five minutes before the postponed OFF timer is to be invoked, the controller will blink the lights again. If the controller receives another ON signal, the OFF timer occurrence will be postponed for another two hours. If the controller receives an OFF signal from the controlling switch anytime during the two hour period, the relays will switch OFF. **Blink alert may be inappropriate for some lighting applications.**

Table 2-1 Programmable Switching

Switch Type	Hardware	Operation	Comments
Momentary ON/OFF	SPDT Momentary Contact (3 wire.) Switch wired to ON, Common & OFF terminals of switch input.	Input switches relay output(s) ON when switch closes across Common & ON terminals. Input switches relay output(s) OFF when switch closes across Common & OFF.	Momentary action permits parallel control from multiple locations utilizing single switch input.
Momentary Push-button	Momentary Push-button (2 wire) switch wired to Common & ON terminals of switch input	Input switches output(s) to opposite state each time switch closes across Common & ON trminals.	Momentary action permits parallel control from multiple locations utilizing single switch input.
Maintained ON/OFF	2 wire maintained. Switch wired across Common & ON terminals of switch input.	When switch closes, relay output(s) turn ON. When switch opens, relay output(s) turn OFF.	Use conventional 3 way switches for multiple switch locations
Maintained Multi-Way	2 wire maintained. Switch wired across Common & ON terminals of switch input.	Relay output(s) toggle each time switch input senses change in state of switch.	A separate switch input must be used for each switch location. SPST switches are used.
Master Override	3 wire maintained. Switch wired across ON, Common, and OFF terminals of switch input.	Actuated switch locks all affected relay output(s) in ON or OFF position.	A separate switch input required for each location in parallel switching. Master Override must be connected to a lower switch input # than other switch inputs controlling the affected outputs. Example: If switch input #4 controls relay output(s) 1,2,3 and you also wish to control these outputs with a master override switch, then you MUST designate the master override as switch input #1 or #2 or #3.
Timer Override	2 wire maintained. Wired across the ON & Common terminals of switch input.	As long as switch is ON, the relay output(s) controlled by this switch will ignore any timers.	Use conventional 3 way switches for multiple switch locations
Variable Timed ON	Momentary Push-button or 2 wire maintained	On switch activation the output will turn on for one of the following programmed times: 15 min., 30 min., 1, 2, or 6 hours.	Five minutes before the expiration of programmed time, the lights will blink a warning. Actuating the switch again will reset the timer and keep the lights on for the programmed time period.

2.2.7 Run Time Monitoring – The controller can store the Run Time (ON time) and the number of ON/OFF cycles of each output for a maximum accumulated count of 65535 minutes (about 45 days). After reaching this count, the controller will reset the run time. You can reset the count at any time by issuing a command to the controller. The runtime information can be retrieved from the controller and written to a file in comma delineated format for import into spreadsheet programs.

2.2.8 Telephone Control – Controllers with the RSX option are equipped with an on-board DTMF (touch tone telephone) interface. The operator dials the phone number of the connected controller and issue (via telephone key presses) ON/OFF control signals to each relay output or issue an ON/OFF command affecting all the relays in the controller.

2.3.9 Networking and Global Control – RSX equipped controllers support passive networking of up to 128 Quanta 1000 controllers. See Section 6 for details.

Notes

Section 3

Installation Procedures

3.0 Section Overview - This section covers the following topics:

- Pre-Installation checks
- Mounting the controller
- Wiring the controller
- Pre-power up checks
- Power-Up & checkout
- Troubleshooting

This section covers installation procedures for the controller as a stand alone unit. Consult Section 6 for information on networking **Quanta 1000** controllers on a RS485 bus.

3.1 Pre-Installation Checks – Do the following before beginning the installation:

1. Verify that you have received the proper equipment. Check the packing slip(s) against the materials you ordered and verify that the material is appropriate for the project. Check to ensure the voltages of the controller(s) transformers match the available power. Report any discrepancies or visible damage at once.

2. Review submittals, programming worksheets, electrical prints, and other project documentation.

3. Ensure you have a **digital multi-meter**.

3.2 Mounting The Controller – Consider the following when selecting a site for the **Quanta 1000**.

3.2.1 Location – Generally speaking, the **Quanta 1000** 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.

3.2.3 Environmental Considerations – The **Quanta 1000** is designed to operate in temperatures between 0-50 degrees C. (32-122 F.) & 10-90% humidity non-condensing.

CAUTION

THE Quanta 1000 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.

3.2.4 Distance From Control Devices – Switches & other control devices can be located up to 1500 feet from the **Quanta 1000** controller using 20 gauge wire.

3.2.5 Remote Lighting Relays – In certain situations (for example if a single branch circuit is split and controlled by multiple lighting relays); mounting of relays remote from the ILC controller may be convenient. You can mount a lighting relay up to 2000 feet from the **Quanta 1000** controller if using 20 gauge wire.

3.2.6 ILC-128 Distance – When installing expansion panels the total distance of the controller/expansion panel network **must not exceed 500 ft.** The distance of any one segment (i.e., the distance between the controller and an expansion panel or between expansion panels) **must not exceed 200 feet. The cable required for the network is shielded 8 conductor color coded cable. 24 gauge; CAROL cable C0744-21-10.**

3.2.7 Phone Line – If the application calls for remote communications or if the controller is an **RSX** unit that is to support a phone switching application, make arrangements for a phone outlet (RJ11) convenient to the **Quanta 1000** controller.

3.3 Wiring The Controller – Perform the following procedures to wire the line and control wiring of the **Quanta 1000. Do NOT apply power to any circuits until instructed to do so.**

3.3.1 Wiring the Controller's Transformers - Wire all transformer primaries.

1. Run a **dedicated 120 or 277 vAC** circuit, including grounding conductor, and terminate it to the primary of **Quanta 1000 control transformer.** (See Figure 3-1.)

2. Run another **120 or 277 vAC** circuit and terminate it to the primary of the **Quanta 1000** switching transformer.

3.3.2 Connecting Line and Load - Connect Line & Load Wires of the line voltage circuits to the Lighting Relays.

3.3.3 Wiring Switch Inputs - Wire the Class 2 Switch Circuits. (See Figure 3-2.)

1. Run the required wiring between each controller & the field-installed switches. Consult the programming worksheets & project documentation to determine the type & quantity of required switch circuits. Check each switch run to ensure 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 appropriate connections to the controller switch input terminals.

NOTE

REFER TO SWITCH INPUT SCHEDULE FOR LANDING WIRES TO INPUTS OR FILL IN SWITCH SCHEDULE AS YOU PROCEED.

CAUTION

IF WIRING A SWITCH USED FOR THE MASTER OVERRIDE FUNCTION, YOU MUST LAND THE WIRES ON A SWITCH INPUT NUMBER WHICH IS LOWER THAN OTHER SWITCH INPUTS WHICH CONTROL THE AFFECTED RELAYS.

3.3.4 Wiring Remote Relays – Wire any remote mounted relays. (See Figure 3-2.)

1. Run the 4 #18 AWG wires (per relay) between the lighting relay and the **Quanta 1000** controller.

2. Check for shorts and opens in each run.

3. Make connections at the relay.

4. Terminate wires to selected relay output in the **Quanta 1000** controller. (Connection tool required.)

3.3.5 ILC-128 Expansion Panels – Connect **Quanta 1000** Controller and ILC-128 Expansion Panels. (See Figure 3-3.)

1. Run required cable between the panels.

2. Check each cable run for shorts between conductors and between conductors and ground. Also verify there are no opens.

3. Terminate the cable as shown in Figure 3-3.

3.3.6 Auxiliary Contacts – When using auxiliary contacts for output relay status ensure that the device you are illuminating is wired to the relay output panel correctly. (See Figure 3-2.)

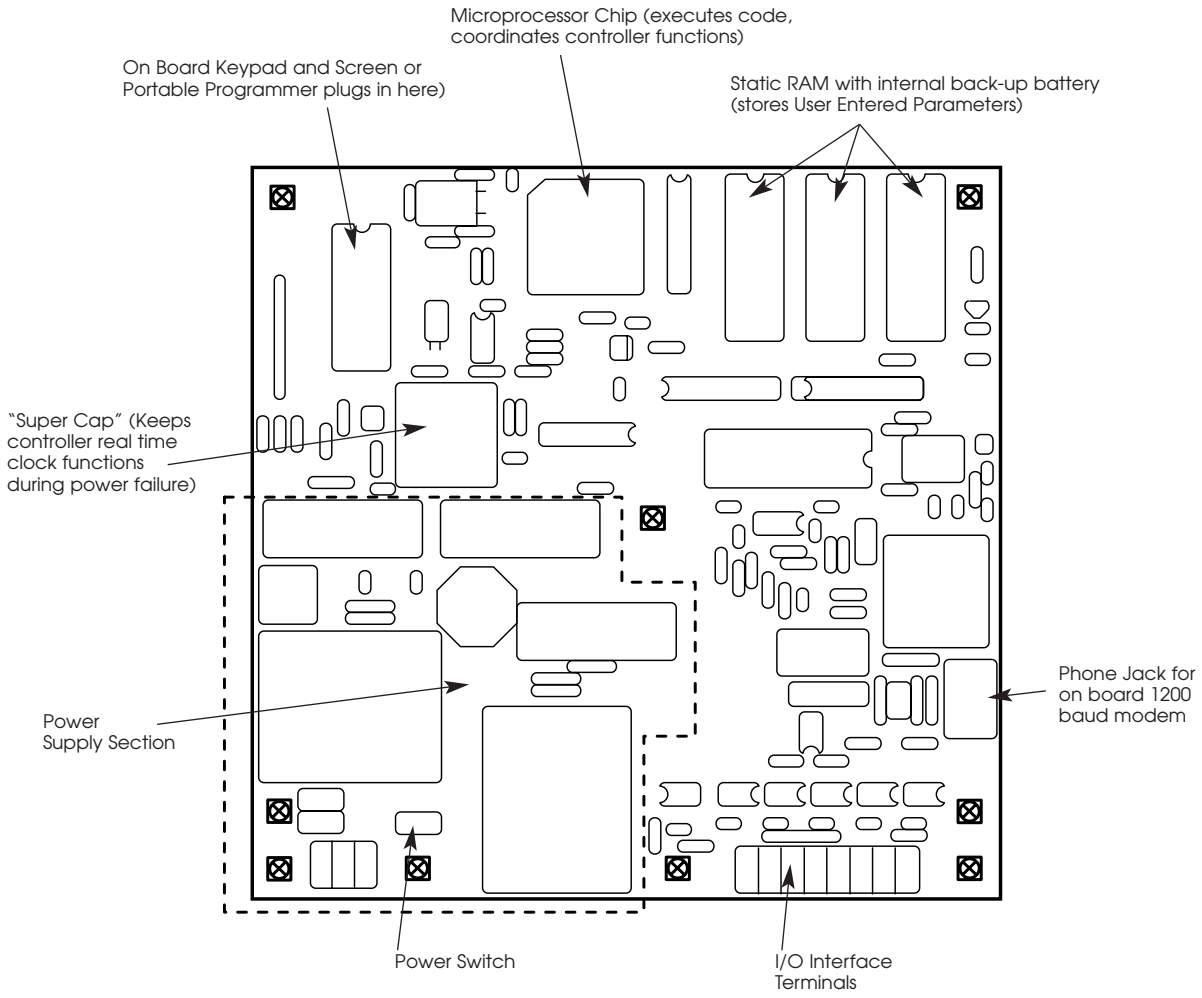
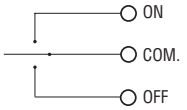
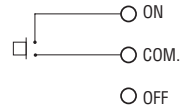


Figure 3-1 CPU Board Detail

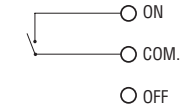
Switch Input Types



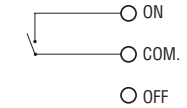
Momentary ON/OFF:
The controlled outputs turn OFF when Common & OFF contacts are momentarily made. The controlled outputs turn ON when Common & ON contacts are momentarily made.



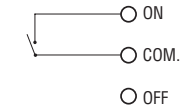
Momentary Pushbutton:
The input turns the controlled outputs to the opposite state each time the switch contacts are momentarily made.



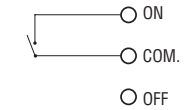
Maintained ON/OFF:
When the input senses a closure it turns the controlled outputs ON. When the input senses an open, the controlled outputs are turned OFF.



Maintained Multi-way:
The controlled outputs toggle each time the input senses a change of state. Function is similar to line voltage 3 and 4 way switching.



Timer Override:
As long as the switch is turned ON, relay output(s) controlled by this switch will ignore any timers that they have been programmed to respond to.



Timed ON:
When the switch is activated, the relay outputs assigned to it will turn ON for a selectable period of time. Five minutes before the specified ON time is to expire, the controller blinks the relay outputs as a warning. At this point the switch can be activated again and the relay outputs will turn ON for the programmed time period.

Switch Input Notes

1. Switch can be located up to 1500 feet from I/O board if minimum of 20 guage wire is used.
2. When parallel switching, momentary switches can be terminated to the same input. But there must be a separate input used for each maintained switch.

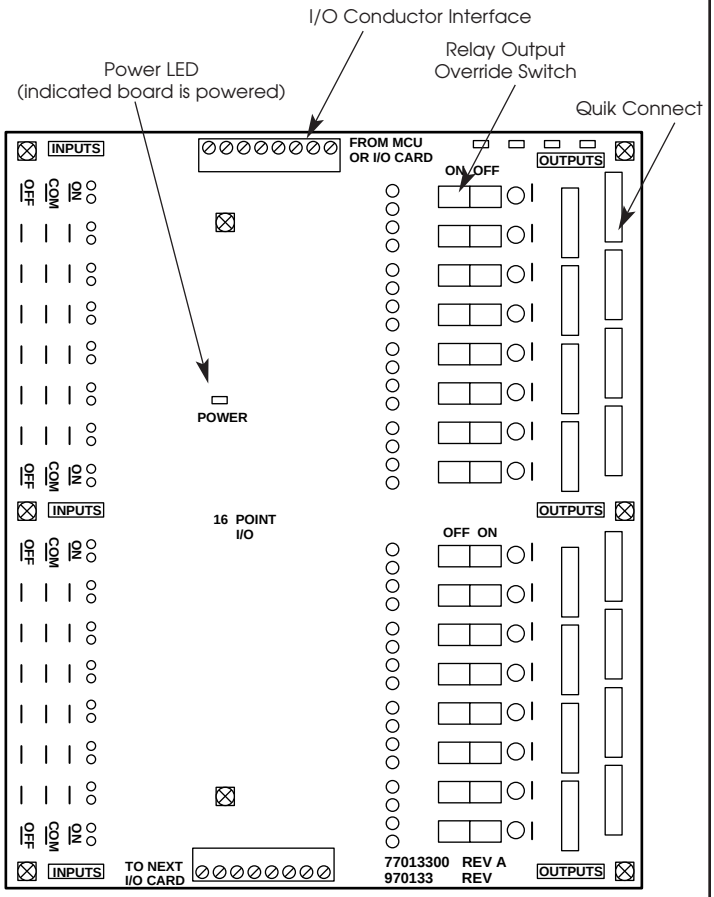
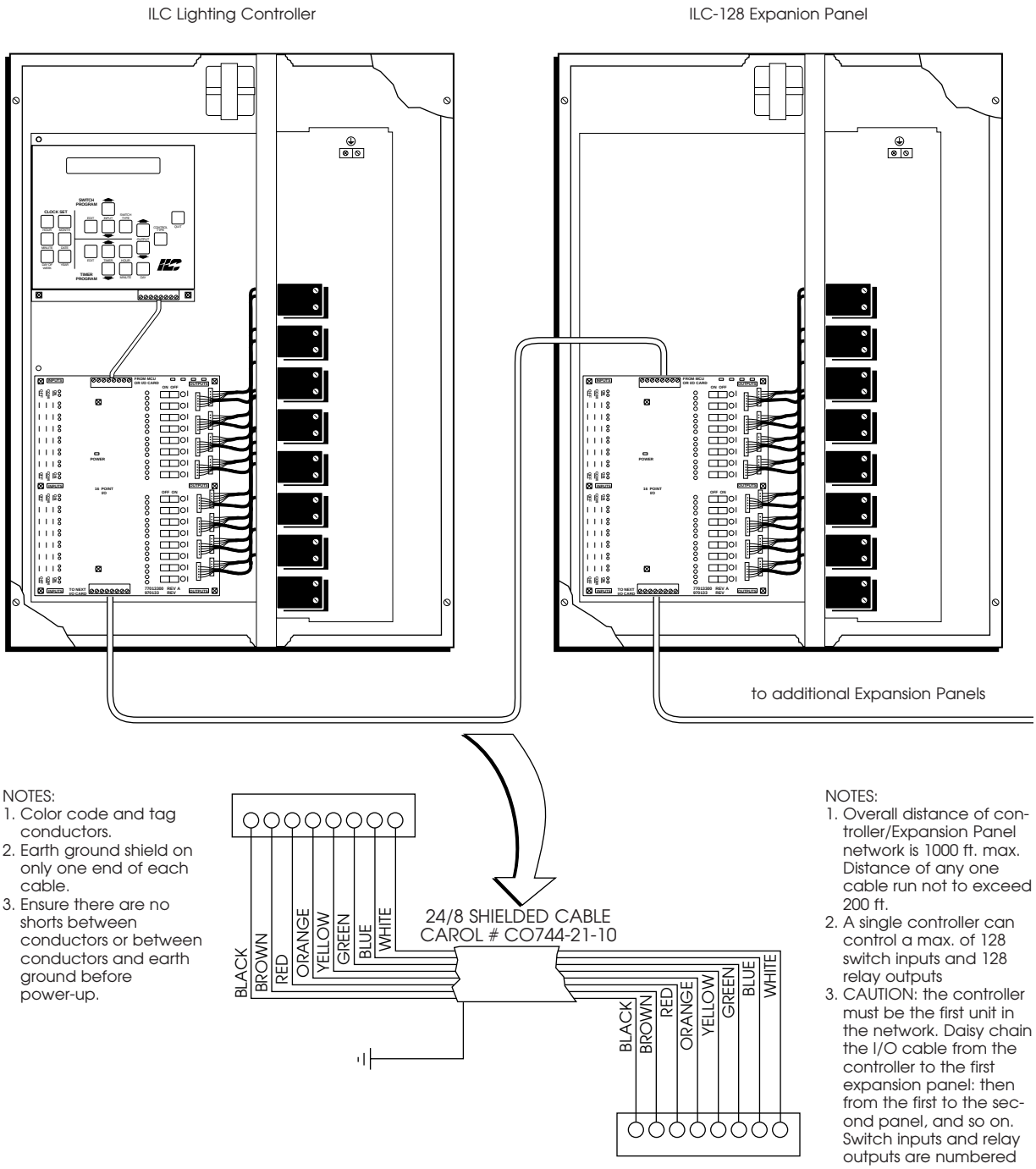


Figure 3-2 I/O Board Detail



NOTES:
1. Color code and tag conductors.
2. Earth ground shield on only one end of each cable.
3. Ensure there are no shorts between conductors or between conductors and earth ground before power-up.

NOTES:
1. Overall distance of controller/Expansion Panel network is 1000 ft. max. Distance of any one cable run not to exceed 200 ft.
2. A single controller can control a max. of 128 switch inputs and 128 relay outputs
3. CAUTION: the controller must be the first unit in the network. Daisy chain the I/O cable from the controller to the first expansion panel: then from the first to the second panel, and so on. Switch inputs and relay outputs are numbered in ascending order beginning with the first input and output on the first I/O board in the controller.

Figure 3-3 Controller To Expansion Panel Cabling

3.4 Pre-Power Checks – Complete the following checks **BEFORE** applying power to the **Quanta 1000** controller.

3.4.1 Check for Correct Voltage On Transformer Secondaries –

1. Verify that the controller power switch is **OFF**.

2. After verifying that control and switching transformer source voltages are 120/277 VAC (which ever is appropriate). Power up circuits supplying control, and switching transformers.

3. Verify that there is 120/277 VAC on the primaries of the transformer.

3.4.2 Verify Controllers Supply Voltage – Verify that there is 24 VAC on secondaries of control & switching circuit transformers.

3.4.3 Double Check Connections –

1. Verify integrity of I/O connections

2. Verify integrity of all internal & external cabling.

3.4.4 Verify The Lighting Relays –

1. After verifying that the source is the correct voltage, power up the circuits feeding the line of the lighting relays.

2. Switch each relay ON and OFF pushing the override switches located on the I/O boards. There are separate ON and OFF switches for each lighting relay. (See Figure 3-2.) Verify that the relay status LED goes ON and OFF. Verify that the relay controls the proper circuit.

3.5 Power-up and Checkout – Complete the following procedures to power-up and checkout the **Quanta 1000** controller.

3.5.1 Power-up the Controller –

1. Connect the temporary programming module if working with a **Quanta 1000** that doesn't have an on board keypad.
2. Turn the power switch located on the CPU board **ON**.
3. Verify that the controller keypad screen displays the default time and date.
4. Verify that the power light on each I/O board is lit. (See Figure 3-2.)

3.5.2 Perform Initial Programming Procedures (See Section 4.) –

1. Configure the controller.
2. Set the correct date & time on the controller.
3. Program the switch inputs & timers.

3.5.3 Verify the Switching Function –

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

3.5.4 Verify the Timer Functions –

1. Set the controller clock to 10 minutes prior to the times required for each programmed timer to occur.
2. Verify that the relays respond as programmed.
3. Reset the controller clock to the correct date & time.

3.5.5 Verify Remote Communications Link – This is performed with a personal computer equipped with **ILC** software located at ILC or another remote location.

1. Connect a phone cord into the jack on the controller CPU board and into the RJ-11 jack.
2. Verify that the remote location can contact the controller and up/down load data.

3.6 Troubleshooting –In the event of trouble, use the following procedures to identify the problem

3.6.1 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 I/O board(s) is lit.

3. If there is proper primary & secondary voltage on the transformer but the power LED is not lit and the keypad screen doesn't come up, the controller CPU board may be bad.

3.6.2 Lighting Relay(s) Will Not Function –

1. Verify that the lighting relay has power on its line side.

2. Verify that the switching transformer has line voltage and that the secondary output is 24 VAC.

3. Make sure that lighting control wiring is landed properly on the relay output of the I/O board. (blue is common, red is ON, black is OFF, orange is status.)

4. Override the affected relay ON/OFF with the override switches located on the I/O board.

5. If the relay doesn't respond replace the relay.

3.6.3 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 switched input LED lights when it senses a switch closure and the relay output LED(s) momentarily flash when the switch is actuated and that the relays respond appropriately.

6. If the relays respond appropriately and the switch input and output LEDs function, there is probably a problem in the field wiring.

7. If the switch input or relay output LEDs don't flash in response to switch actuation, the I/O board may be bad.

3.6.4 Timers Will Not Function Properly –

1. **Check your programming**.

2. Verify that affected relay output LEDs momentarily flash at the times lighting relays are to change state. If the LEDs don't flash, you may have a bad I/O board.

3. Be sure at least 10 minutes have passed before activating a timer to start a test.

3.6.5 An Entire I/O Board(s) Doesn't Work –

1. Check programming especially to ensure the controller is configured to control the required number of I/O points.

2. Check to ensure that the I/O cable linking the I/O boards is connected properly and is free of opens and shorts.

3. Check to ensure that the power LED on the I/O board is lit.

4. If the I/O board is cabled correctly and programmed correctly but still doesn't function, you may have a bad I/O board.

3.6.6 Remote Communications Doesn't Work –

1. Verify that the remote location has the correct phone number of the controller.
2. Verify that the controller is securely plugged into the phone jack.
3. Detach the controller from the jack & temporarily connect a telephone.
4. If the remote location can call the telephone, the problem may be a bad CPU board. If the remote location can't connect with the phone, something is wrong with the phone line.

Notes

Section 4

Initial Programming Procedures

4.0 Section Overview – This section covers basic programming procedures performed prior to or at the time of initial system start-up. You are **strongly encouraged** to conduct them in the order that they are discussed. Topics covered in this section are:

- Filling Out Programming Worksheets
- Keypad and Screen Description
- Configuring The Controller
- Setting The Controller Clock
- Programming The Switch Inputs
- Programming The Timers
- Programming The Holidays

Additional Programming procedures are covered in Section 5. Programming procedures related to RSX equipped controllers and the optional Global Module Controller are covered in Section 6 & 7.

4.1 Programming Worksheets – **BEFORE** attempting to **install** the **Quanta 1000** you **MUST** fill out the programming worksheets. The worksheets allow you to detail the project and control strategy you wish to implement. This will speed programming, minimize error, and rework and ensure that you have specified switches and provided sufficient I/O points to accomplish your control objectives. There are separate worksheets for **relay output, switch input, timer,** and **holiday** programming. Each of the four worksheet forms includes explanations of the parameters and concepts involved in programming.

4.1.1 Complete The Relay Output Worksheet – (See Figure 4-1) To fill out the relay output worksheet:

1. Enter the project name and controller description.
2. Enter the **relay #**. Depending on your system configuration, the controller could have up to 128 relay outputs.
3. Enter the voltage type, either 120 vAC or 277 vAC, for the relay output.
4. Enter the circuit controlled by the relay output.

5. Enter the area controlled by the relay output.

6. Repeat steps 2-5 for the remaining relay outputs to be included in the controller.

4.1.2 Complete The Switch Input Worksheet – (See Figure 4-2) To fill out the switch input worksheet:

1. Enter the project name and controller description.

2. Enter the **input #**. Depending on your system configuration, the controller could have up to 128 switch inputs.

3. Enter one of the following **input types**:
   - Momentary On/Off
   - Momentary push-button
   - Maintained On/Off
   - Maintained multi-way
   - Master override
   - Timer override
   - Variable timed On – 15 minutes, 30 minutes, 1,2, or 6 hours.

4. Enter the **relay output(s)** you want the switch input to control. Depending on the configuration of the controller, up to 128 relay outputs may be available for control.

5. Enter the **control type**. You can program the relay output(s) to respond to the switch input in one of the following ways:
   - ON only
   - OFF only
   - ON and OFF

6. Enter the **circuit(s)** controlled by the lighting relays terminated to the relay output(s).

7. Enter the **area(s) controlled** by the lighting relays.

8. Repeat steps 2-7 for the remaining switch inputs to be programmed.

Quanta Lighting Controller Relay Output Worksheet

PROJECT: *EXAMPLE* **SAMPLE WORKSHEET** CONTROLLER/PANEL: _____

RELAY # (1-128)	VOLTAGE TYPE (120/277)	CIRCUIT CONTROLLED	AREA CONTROLLED
1	120	LIA-1	Reception Area Track Lighting
2	120	LIA-2	Restroom-Men
3	120	LIA-3	Restroom-Women
4	277	HIA-1	Office Corridor-North
5	277	HIA-2	Office Corridor-South
6	277	HIA-3	Office Corridor-East
7	277	HIA-4	Office Corridor-West
8	277	HIA-5	Lobby
9	277	HIA-6	Main Entrance

NOTE: Duplicate this form to document all Switch Input Control.

INTELLIGENT LIGHTING CONTROLS, INC.
5229 Edina Industrial Boulevard
Minneapolis, Minnesota 55439
Phone 612 829 1900
FAX 612 829 1901
1-800-922-8004

Figure 4-1, Sample Relay Output Worksheet

Quanta Lighting Controller Relay Output Worksheet

PROJECT: _____ **CONTROLLER/PANEL:** _____

RELAY # (1-128)	VOLTAGE TYPE (120/277)	CIRCUIT CONTROLLED	AREA CONTROLLED

NOTE: Duplicate this form to document all Switch Input Control.

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1-800-922-8004

Quanta 1000 Controller Switch Input Worksheet

PROJECT: *EXAMPLE* **SAMPLE WORKSHEET** **CONTROLLER:** *CENTER 1-N.W.*

INPUT# (1-128)	INPUT TYPE	RELAY OUTPUTS CONTROLLED (1-128) & CONTROL TYPE		AREA CONTROLLED
1	Master Override	1,2,3,4,5,6,7,8,9,10	ON/OFF	All Corridors
2	Maintained ON/OFF	15,16	ON/OFF	All Corridors
3	Maintained ON/OFF	1	ON/OFF	Corridor-South
4	Maintained ON/OFF	2	ON/OFF	Corridor-North
5	Maintained ON/OFF	3	ON/OFF	Corridor-East
6	Maintained ON/OFF	4	ON/OFF	Corridor-West
7	Maintained ON/OFF	5	ON/OFF	Corridor-Center
8	Maintained ON/OFF	6	ON/OFF	Corridor-Southwest
9	Maintained ON/OFF	7	ON/OFF	Corridor-Southeast
10	Maintained ON/OFF	8	ON/OFF	Corridor-Northwest
11	Maintained ON/OFF	9	ON/OFF	Corridor-Northeast
12	Maintained ON/OFF	10	ON/OFF	Corridor to Hub
13	Maintained ON/OFF	11	ON/OFF	Campus Restrooms
14	Maintained ON/OFF	12	ON/OFF	Central Restrooms
15	Maintained ON/OFF	13	ON/OFF	Security Hub
16	Maintained ON/OFF	14	ON/OFF	Security Garage

NOTE: Duplicate this form to document all Switch Input Control.

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Minneapolis, Minnesota 55439
Phone 612 829 1900
FAX 612 829 1901
1-800-922-8004

Figure 4-2, Sample Switch Input Worksheet

Quanta 1000 Controller Switch Input Worksheet

PROJECT: _____ **CONTROLLER:** _____.

INPUT# (1-128)	INPUT TYPE	RELAY OUTPUTS CONTROLLED (1-128) & CONTROL TYPE	AREA CONTROLLED

NOTE: Duplicate this form to document all Switch Input Control.

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FAX 612 829 1901
1-800-922-8004

4.1.3 Timer Programming Worksheet – (See Figure 4-3.) The **Quanta 1000** can implement up to **32 Timers**. To fill out the timer worksheet:

1. Enter the project and controller description.

2. Enter the **Timer #** (1-32).

3. Enter the time of day you want the **timer** to activate.

4. Enter the relay output(s) you want the **timer** to turn ON.

5. Enter the relay output(s) you want the **timer** to turn OFF or OFF with Blink Alert.

6. Select the day(s) of the week or holiday type specifying when the controller is to implement the **timer**. (If desired, flag the timer to ignore holidays) Choices are:

   - a single week day (ie. Sunday, Monday, Tuesday etc.)
   - Monday-Friday
   - Saturday-Sunday
   - All (7) days of the week
   - Holiday A, Holiday B

7. Repeat steps 2-6 for the remaining **timers**.

Quanta 1000 Lighting Controller Timer Worksheet

PROJECT: *EXAMPLE* **SAMPLE WORKSHEET** CONTROLLER: *CENTER 1-N.W.*

TIMER# (1-32)	TIMER TIME	CONTROLLER RELAY OUTPUT(S) ON (1-128)	CONTROLLER RELAY OUTPUT(S) OFF (1-128)	CONTROLLER RELAY OUTPUT(S) OFF WITH BLINK (1-128)	DAY(S) OF WEEK ALL DAYS SAT & SUN HOLIDAY A OR B
1	4:00 AM	5-8			S M T W TH F S Holiday A or B
2	5:00 AM	9-12			S M T W TH F S Holiday A or B
3	5:30 AM	1-4			S M T W TH F S Holiday A or B
4	5:30 PM			1-4	S M T W TH F S Holiday A or B
5	6:30 PM		5,6		S M T W TH F S Holiday A or B
6	7:30 PM		7,8		S M T W TH F S Holiday A or B
7	8:30 PM		9,10		S M T W TH F S Holiday A or B
8	9:30 PM		11,12		S M T W TH F S Holiday A or B
9	8:00 AM	5,9,7,11			S M T W TH F S Holiday A or B
10	11:30 PM		5,9,7,11		S M T W TH F S Holiday A or B
11					S M T W TH F S Holiday A or B
12					S M T W TH F S Holiday A or B
13					S M T W TH F S Holiday A or B
14					S M T W TH F S Holiday A or B
15					S M T W TH F S Holiday A or B
16					S M T W TH F S Holiday A or B

NOTES:

Enter the "Astro Offset Time" (in 15 min. increments) in the "Timer Time" field, if the relay group is to be turned ON or OFF based on Sunrise or Sunset rather than a specific time of day.

Duplicate this form to document all Timers.

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Minneapolis, Minnesota 55439
Phone 612 829 1900
FAX 612 829 1901
1-800-922-8004

Figure 4-3, Sample Timer Worksheet

Quanta 1000 Lighting Controller Timer Worksheet

PROJECT: _____ **CONTROLLER:** _____

TIMER# (1-32)	TIMER TIME	CONTROLLER RELAY OUTPUT(S) ON (1-128)	CONTROLLER RELAY OUTPUT(S) OFF (1-128)	CONTROLLER RELAY OUTPUT(S) OFF WITH BLINK (1-128)	DAY(S) OF WEEK ALL DAYS SAT & SUN HOLIDAY A OR B

NOTES:

Enter the "Astro Offset Time" (in 15 min. increments) in the "Timer Time" field, if the relay group is to be turned ON or OFF based on Sunrise or Sunset rather than a specific time of day.

Duplicate this form to document all Timers.

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4.1.4 Holiday Worksheets – (See Figure 4-4.) You can program the controller to implement up to **32 Holidays**. On the **holiday date**, the controller will substitute either the **Type A** or **Type B Holiday Timers** for the **Timers** normally invoked on that date. To fill out the holiday programming worksheet:

1. Enter the project and controller descriptions.

2. Enter the description or name of the **holiday**.

3. Enter the **holiday** date.

4. Indicate whether the **holiday** is **Type A** or **B**.

5. Fill in the **timer #(s)**. These will be either the **Type A** or **B Timers** you developed on the timer programming worksheet.

6. Enter any additional information or comments you feel are useful concerning the holiday.

7. Repeat steps 2-6 for the remaining **holidays.**

NOTE

All Timers are deactivated on a holiday date unless they are programmed to ignore holidays. For example, timers used to turn off relays are typically programmed to ignore holidays.

Quanta 1000 Lighting Controller Holiday Worksheet

PROJECT: *EXAMPLE* **SAMPLE WORKSHEET** CONTROLLER: *CENTER 1-NW*

HOLIDAY (1-32)	HOLIDAY NAME	HOLIDAY PERIOD DATE	TIMERS USED SEE TIMER SCHEDULE	HOLIDAY (A) OR (B)	COMMENTS
1	NEW YEAR'S DAY	1/1/94	1, 2	A	Security OFF at 6:00 am Security ON at 6:00 pm
2	PRESIDENT'S DAY	2/21/94	1, 2	A	Security OFF at 6:00 am Security ON at 6:00 pm
3	MEMORIAL DAY	5/30/94	1 2	A	Security OFF at 6:00 am Security ON at 6:00 pm
4	SUMMER VACATION	6/22/94	3, 4	B	Security OFF at 6:00 am Security ON at 6:00 pm
5	LABOR DAY	9/5/94	1, 2	A	Security OFF at 6:00 am Security ON at 6:00 pm

NOTE: Duplicate this form to document.

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Figure 4-4, Sample Holiday Worksheet

Quanta 1000 Lighting Controller Holiday Worksheet

PROJECT: _____ CONTROLLER: _____

HOLIDAY (1-32)	HOLIDAY NAME	HOLIDAY PERIOD DATE	TIMERS USED SEE TIMER SCHEDULE	HOLIDAY (A) OR (B)	COMMENTS

NOTE: Duplicate this form to document.

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4.2 Keypad & Screen Description – The keypad and screen make up the **Quanta 1000 programming module**. Each **Quanta 1000 programming module** is either integral to the controller or is a portable device temporarily attached to the controller during programming. The **keypad** is composed of tactile response single and multi-function keys. The **screen** is a 2 line, 24 character per line LCD display.

4.2.1 Home Screen – Figure 4-5 shows the **keypad** displaying the **Home screen**. The **Home screen** displays the current date and time. All other screens, available for programming branch from this screen. The controller returns to this screen after a **time out** period has occurred on the other screens or after you press the **Quit** key.

4.2.2 Screen Time Out/Auto Data Save – It is **not necessary** to take specific action to save entries you have programmed into the controller. When the controller senses a lack of keypad activity for a certain period on one of the programming screens, it returns the system to the Home screen. This **time out** period varies with the type of screen involved. The **time out** for **switch, timer, and holiday** screens is **20 seconds**. The **time out** period for the **time/date** and **system configuration** screens is **5 seconds**. **NOTE: All programming is saved in real time.**

4.2.3 Special Keystrokes – You must **simultaneously** press certain keys to invoke some of the controllers programming options. See Table 4-1 for a listing of these keystrokes.

4.3 Programming Procedures – Tables 4-2 through 4-6 and Figures 4-6 through 4-10 detail initial programming procedures. It is **strongly recommended** that you perform them in the following order:

- configure the controller (set the number of I/O points)
- set the controller's real time clock.
- program the switch inputs
- program the timers
- program the holidays

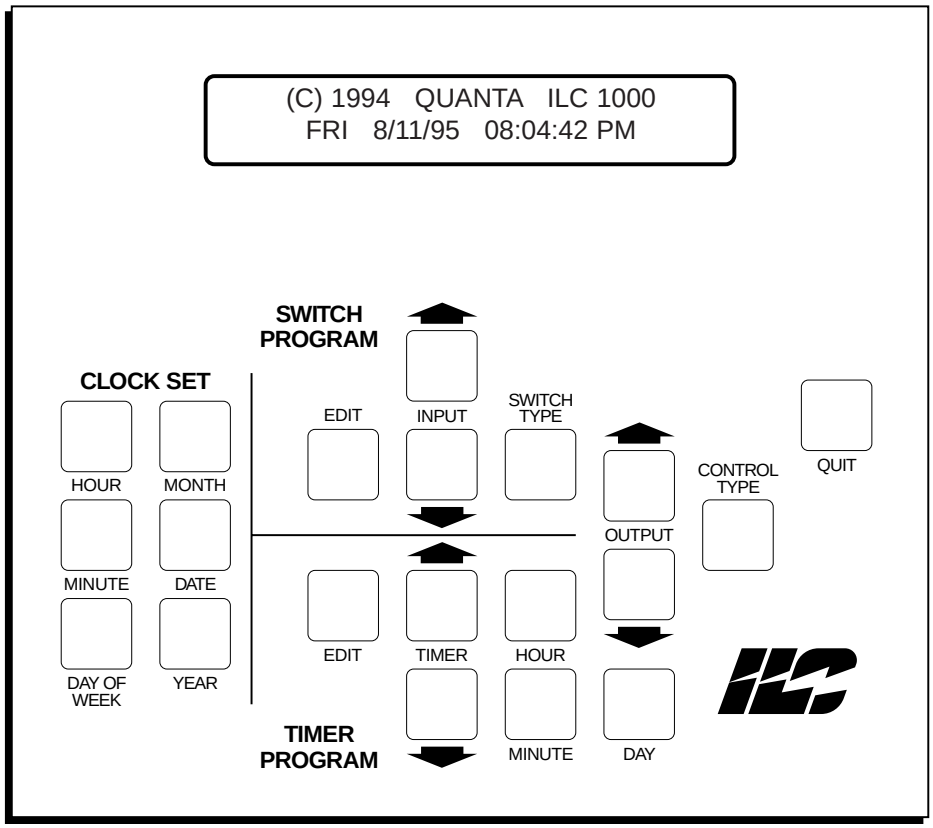


Figure 4-5 Programming Module With Home Screen

Table 4-1 Special Keystrokes

Function	Keystrokes	Comments
Clear Programming	HOUR/MINUTE/DAY OF WEEK (cycle power)	Clears all entries for switches, timers, and holidays etc. **The keys must be pressed during power-up.**
Configure I/O	INPUT ↑/OUTPUT ↑	Accesses screen used to enter the number of inputs and outputs the controller is equipped with.
Program Holidays	TIMER ↓/DAY	Accesses screen used to program holidays.
Set Node Address	SWITCH TYPE/CONTROL TYPE	Accesses screen used to set the network addresses of a RSX equipped controller.
Baud Rate	CONTROL TYPE/QUIT	Accesses screen used to set the communications speed of a RSX equipped controller RS485/RS232 port.
Firmware Revision	OUTPUT ↑/OUTPUT ↓	Accesses screen displaying the current controller firmware revision.
Program Daylight Savings	INPUT ↑/TIMER ↓	Accesses screen used to program daylight savings time variables.
Switch Input Status	SWITCH TYPE/INPUT ↑	Accesses screen displaying the current state of the switch inputs.
Output Status/Force	SWITCH TYPE/INPUT ↓	Accesses screen displaying the current state of the relay outputs. Outputs may be forced ON/OFF from this screen.
Timer Output Type	SWITCH TYPE/HOUR	Accesses screen where you select the timer output types; either blink (default) or five second Off pulse.
Power On Settings	SWITCH TYPE/OUTPUT ↓	Accesses screen used to define the state the controller will set each output to when power is applied to the controller. (Default is no action; relay output retains state it was in before application/re-application of power to the controller.
Astro Clock Settings	TIMER ↑/MINUTE	Accesses screen used to enter Astro Time variables
Ignore Holiday	SWITCH TYPE	When on the Timer Edit Screen, pressing SWITCH TYPE will toggle the ignore holiday option.
Normal/Astro time toggle	Yellow EDIT	When on the Timer Edit screen, will toggle between normal and Astro time
Astro Selection	HOUR	When on the Timer Edit screen and toggled to Astro time, pressing the HOUR key will scroll through the astro time choices.

Table 4-2, Configure Controller

Keys/Functions	Procedure	Comments/Example
INPUT ↑ accesses configure screen **OUTPUT** ↑ accesses configure screen	**1. Press INPUT** ↑ & **OUTPUT** ↑ simultaneously **2. Press OUTPUT** ↑ or **OUTPUT** ↓ until number of I/O points the controller is equipped with appears. **3. Let controller time out or press QUIT.**	**The Quanta 1000 is defaulted for control of the minimum 8 inputs & outputs The I/O configuration must match the total number of I/O points configured in the system.** **Example: Assume that the controller has 24 I/O points but is currently configured for 8.** **1. Press OUTPUT** ↑ & **INPUT** ↑ at the same time. **2. Press OUTPUT** ↑ 2 times. **3. Let the controller time out or press QUIT..**

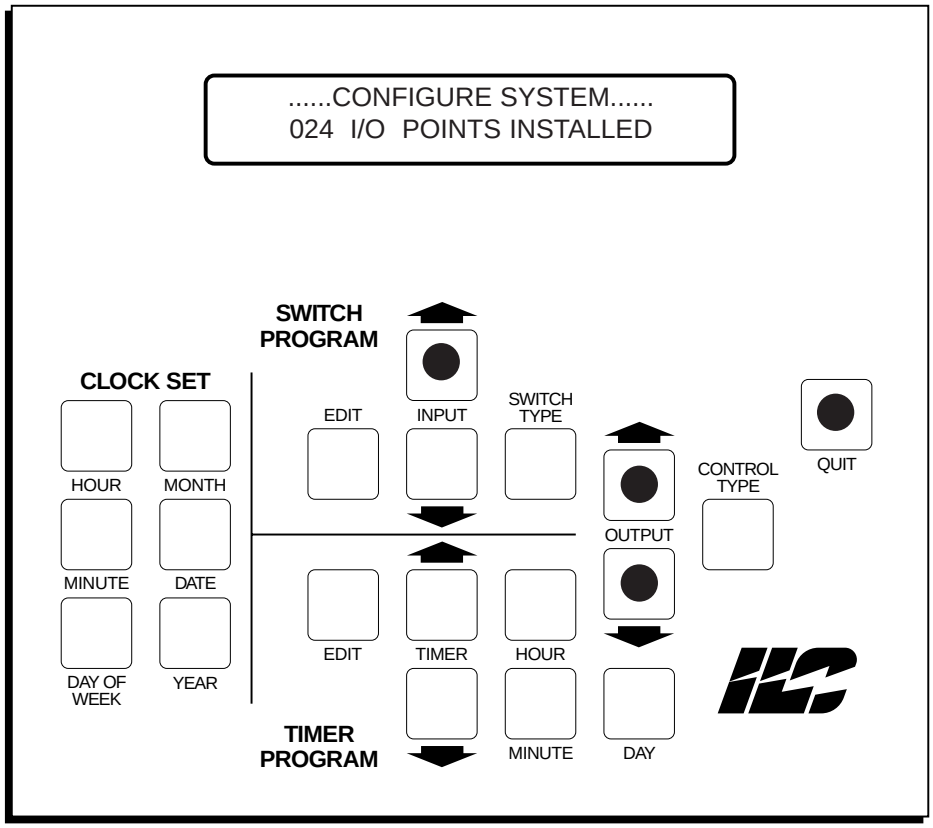


Figure 4-6 Configure Controller I/O

Table 4-3, Set The Clock

Keys/Functions	Procedure	Comments/Example
DAY OF WEEK sets the current day of week **MONTH** sets the current month **DATE** sets the current day of month **YEAR** sets the current year **HOUR** sets the current hour **MINUTE** sets the current minute	**1. Press any of the keys in the CLOCK SET** sector of the keypad. **2. Press DAY OF WEEK** until the correct day of the week appears. **3. Press MONTH** until the correct number for the month appears. **4. Press DATE** until the correct day of the month appears. **5. Press YEAR** until the correct year appears. **6. Press HOUR** until the correct hour appears. Make sure the **AM/PM** designation is correct. **7. Press MINUTE** until the minute appears. **8. Let the controller time out or press QUIT.**	**Example:** Assume initial date/time is Sat. 10/07/95 12:45 AM. You wish to set the clock to Mon. 11/13/95 02:50 PM. **In CLOCK SET sector of keypad:** **1. Press DAY OF WEEK** twice. **2. Press MONTH** once. **3. Press DATE** four times. **4. Press HOUR** 14 times. **5. Press MINUTE** 5 times. **6. Let controller time out or press QUIT.**

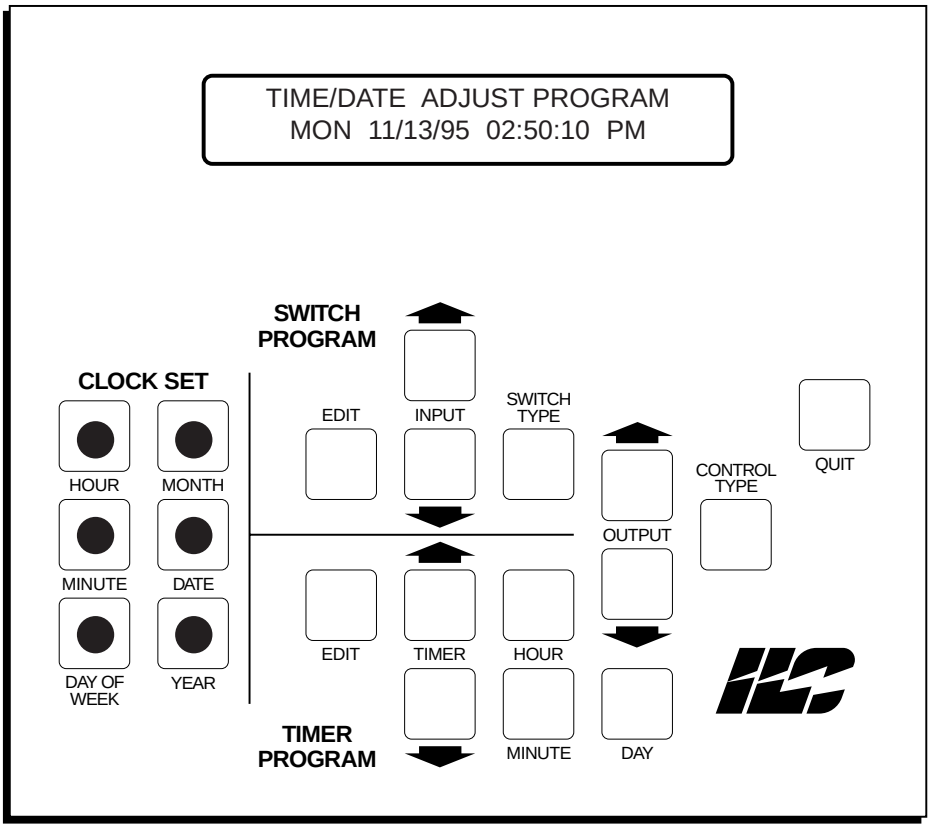


Figure 4-7, Clock Set Programming

Table 4-4, Programming Switch Inputs

Keys/Functions	Procedure	Comments/Examples
EDIT (Yellow) accesses input screen **INPUT** ↑ scrolls inputs in descending order **INPUT** ↓ scrolls inputs in ascending order **SWITCH TYPE** sets switch type **OUTPUT** ↑ scrolls outputs in descending order **OUTPUT** ↓ scrolls outputs in ascending order **CONTROL TYPE sets output control type** **QUIT** saves entries without waiting for controller time out.	**1. Press EDIT** in the switch program sector of the keypad. **2. Press INPUT** ↑ or **INPUT** ↓ to access the input you want to program. **3. Press SWITCH TYPE** until the desired switch type appears. **4. Press OUTPUT** ↑ or **OUTPUT** ↓ until the first output to be controlled appears. **5. Press CONTROL TYPE** until the desired control type appears. **6. Repeat steps 4 & 5 for other outputs that are being controlled by the input.** **7. Repeat 2-6 to program other inputs.** **8. Press QUIT** or let the controller time out.	**Example:** Program switch input 3 as a maintained On/Off switch which controls relay outputs 10 & 11 ON/OFF. **1. Press EDIT** **2. Press INPUT** ↓ or until IN# 003 appears. **3. Press SWITCH TYPE** until MAINTAIN ON/OFF appears. **4. Press OUTPUT** ↓ until OUT# 010 appears. **5. Press CONTROL TYPE** until ON/OFF CONTROL appears. **6. Press OUTPUT** ↓ again so that OUT# 11 appears. **7. Press CONTROL TYPE** until ON/OFF CONTROL appears. **8. Press QUIT** or let the controller time out.

Quick Reference

Switch Types:

Momentary ON/OFF
Momentary Push-button
Maintained ON/OFF
Maintained Multi-Way
Master Override
Timer Override
Variable Timed On

Control Types:

ON only
OFF only
ON/OFF

Programmable I/O: Up to 128 each

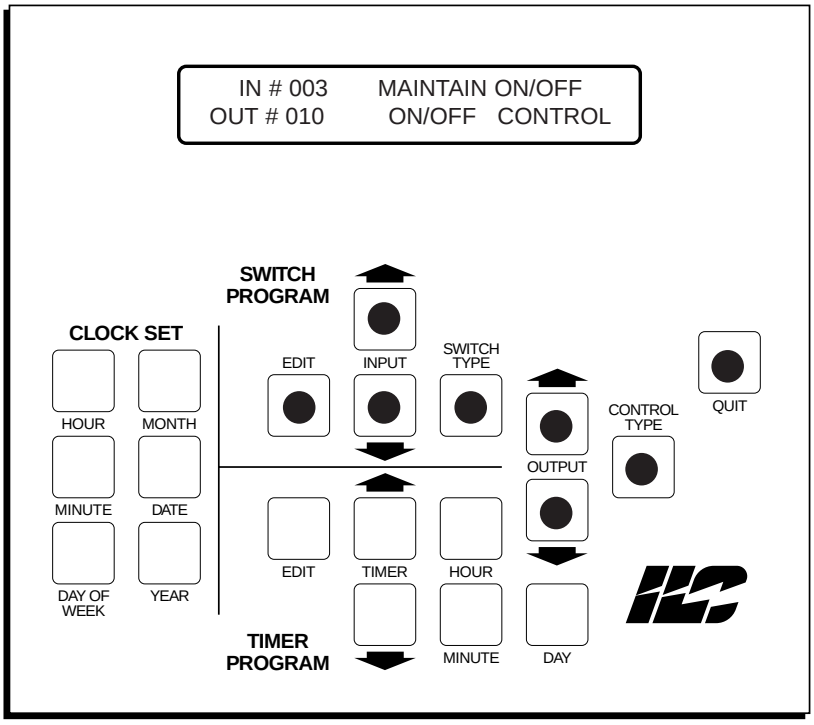


Figure 4-8, Switch Programming Screen

Table 4-5, Timer Programming

Keys/Functions	Procedure	Comments/Examples
Keys/Functions **EDIT** (Blue) accesses timer programming screen **TIMER** ↑ scrolls timers in descending order **TIMER** ↓ scrolls timers in ascending order **HOUR** sets hour of timer occurrence or if in Astro time the timer relationship to sunrise/sunset **MINUTE** sets minute of timer occurrence **DAY** sets day(s) on which timer is to be invoked **EDIT** (Yellow) **toggles between** normal and Astro Time **SWITCH TYPE** used to flag timer to ignore holidays **OUTPUT** ↑ scrolls outputs in descending order **OUTPUT** ↓ scrolls outputs in ascending order **CONTROL TYPE** sets output control type **QUIT** saves entries without waiting for controller time out.	**Procedure** **1. Press EDIT** (Blue) **2. Press TIMER** ↑ or **TIMER** ↓ to accesses desired timer. **3. Press HOUR** until desired hour appears. **4. Press MINUTE** until desired minute appears. **5. Press DAY** until desired day(s) appear.Then if desired, press **SWITCH TYPE**; an I_H will appear indicating that the timer will ignore holidays **6. Press OUTPUT** ↑ or **OUTPUT** ↓ until first output to be controlled appears. **7. Press CONTROL TYPE** until desired control type appears. **8. Repeat steps 6 & 7 to program additional outputs controlled by the timer.** **9. Repeat steps 2-8 to program additional timers.** **10. Press QUIT** or let the controller time out.	**Comments/Examples** **Example:** Program timer 2 to turn output 2 ON and output 4 OFF at 6:30 AM Monday-Friday. **1. Press EDIT**. **2. Press TIMER** ↓ until TIMER 02 appears. **3. Press HOUR** until 06: A appears **4. Press MINUTE** until :30 appears. (Time should now appear as 06:30A) **5. Press DAY** until MON-FRI appears. **6. Press OUTPUT** ↓ until OUT# 002 appears. **7. Press CONTROL TYPE** until ON CONTROL appears. **8. Press OUTPUT** ↓ until OUT# 004 appears. **9. Press CONTROL TYPE** until OFF CONTROL appears. **10. Press QUIT** or let the controller time out.

Quick Reference

Timer = an ON/OFF signal generated at a certain point in time. Max. available # of TIMERS **= 32.**

Available Outputs: Up to 128

Control Options: Turn output(s) ON, Turn output(s) OFF, Off with Blink Alert, Output ignores holiday schedule.

Available Days: SUN, MON, TUE, WED, THUR, FRI, SAT, MON-FRI, SAT-SUN, DAILY, Holiday A or Holiday B

Astro Time Options: sunrise or up to 120 minutes before or after (in 15 minute increments); (sunset or up to 120 minutes before or after in 15 minute increments).

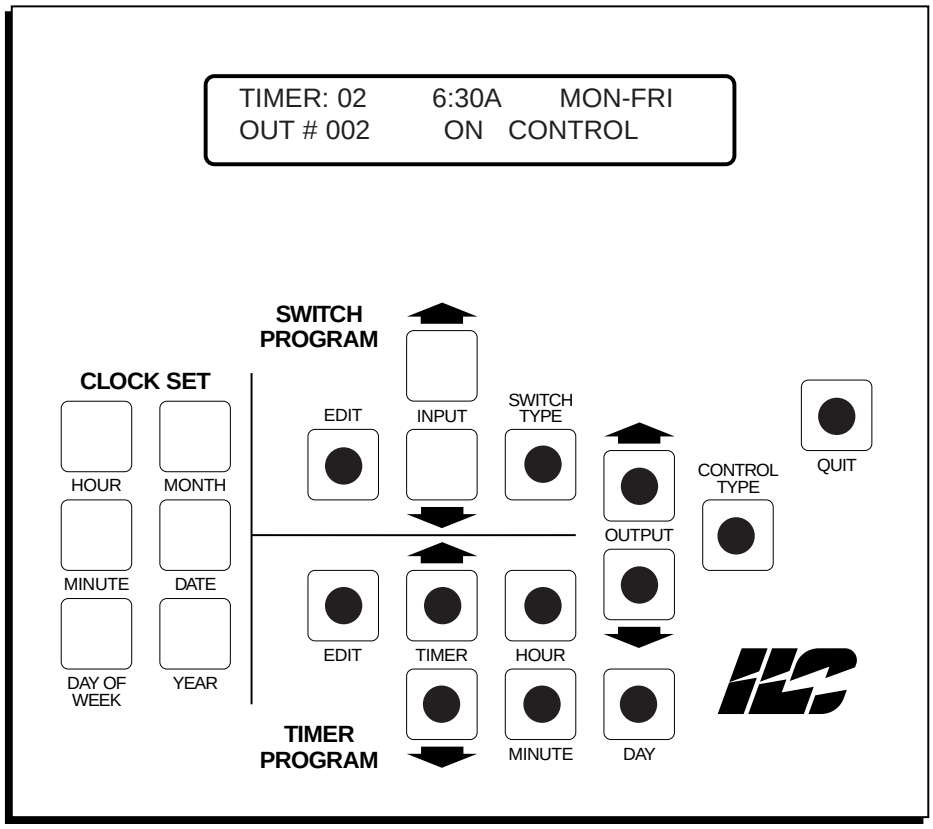


Figure 4-9, Timer Programming

Table 4-6, Holiday Programming

Keys/Functions	Procedure	Comments/Examples
TIMER ↓ accesses holiday screen **DAY** accesses holiday screen **OUTPUT** ↑ scrolls holiday numbers in ascending order **OUTPUT** ↓ scrolls holiday numbers in descending order **DATE** sets day of holiday **MONTH** sets holiday month **CONTROL TYPE** sets holiday type **QUIT** saves entries without waiting for screen time out.	**1. Press TIMER** ↓ & **DAY** at the same time. **2. Press OUTPUT** ↓ or **OUTPUT** ↑ to access the holiday you want to program. **3. Press MONTH** until you reach the holiday's month. **4. Press DATE** until you reach the holiday's date. **5. Press CONTROL TYPE** until desired holiday type is reached.	**Example:** Program December 25 as Holiday 10, Type A. **1. Press TIMER** ↓ & **DAY** at the same time. **2. Press OUTPUT** ↓ until you reach holiday 10. **3. Press MONTH** until 12 appears. **4. Press DATE** until 25 appears. **5. Press CONTROL TYPE** until HOLIDAY A appears. **6. Press QUIT** or let the controller time out the screen.

Quick Reference

Maximum programmable Holidays = 32

Holiday Types:

A = timers programmed as Holiday A

B = timers programmed as Holiday B

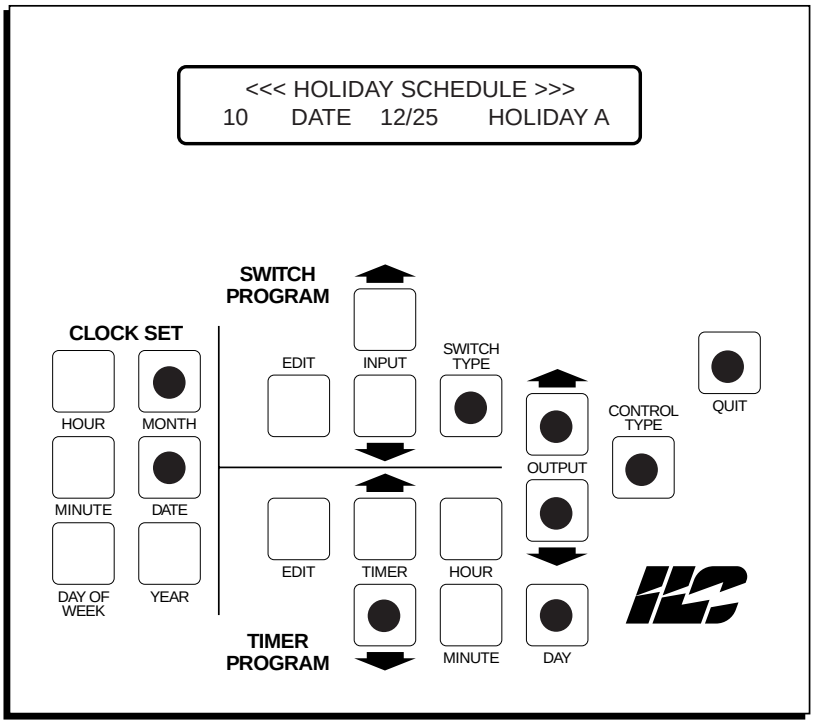


Figure 4-10, Holiday Programming

Notes

Section 5

Additional Programming Operations

5.0 Section Overview – This section covers additional programming operations. The topics covered are:

- Daylight Savings Time
- Programming Power On Settings
- Programming Output Types
- Programming Astro-Clock Settings
- Programming A Timer In Astro-Time
- Checking Switch Input Status
- Checking Relay Output Status
- Displaying The Controller Firmware Revision
- Resetting The Controller

See Section 6 for setting the node address and baud rate of RSX equipped controllers.

5.1 Programming Daylight Savings Time Variables – The default state of the controller is daylight savings adjustment disabled. You **must** take action to enable and set daylight savings time variables.

Table 5-1 Daylight Savings

Keys/Functions	Procedure	Comments/Examples
INPUT ↑ accesses screen **TIMER** ↓ accesses screen **INPUT** ↑ to select the Sunday and month daylight savings begins **INPUT** ↓ to select the Sunday and month daylight savings begins **OUTPUT** ↑ to select the Sunday and month daylight savings ends **OUTPUT** ↓ to select the Sunday and month daylight savings ends **SWITCH TYPE** to enable/disable daylight savings function. **QUIT** saves entries without waiting for controller time out.	**1.** Press **INPUT** ↑ and **TIMER** ↓ simultaneously. **2. Press INPUT** ↓ or **INPUT** ↑ to select which Sunday and month daylight savings to begins. **3. Press OUTPUT** ↓ or **OUTPUT** ↑ to select the Sunday and month daylight savings ends. **4. Press SWITCH TYPE** to enable or disable the daylight savings time function. **5. Press QUIT** to end and save the entries.	**The Quanta 1000 default is set with the Daylights savings function disabled.** **Example: Program the controller to implement daylight savings from the first Sunday in April to the fifth Sunday in October** **1. Press INPUT** ↑ & Press **TIMER** ↓ at the same time. **2. Press INPUT** ↑ **or INPUT** ↓ **until 1st/Apr appears as the start date.** **3. Press OUTPUT** ↑ **or OUTPUT** ↓ **until 5th/Oct appears as the end date** **4. Press Switch Type until Enabled appears** **5. Press QUIT or let the controller time out.**

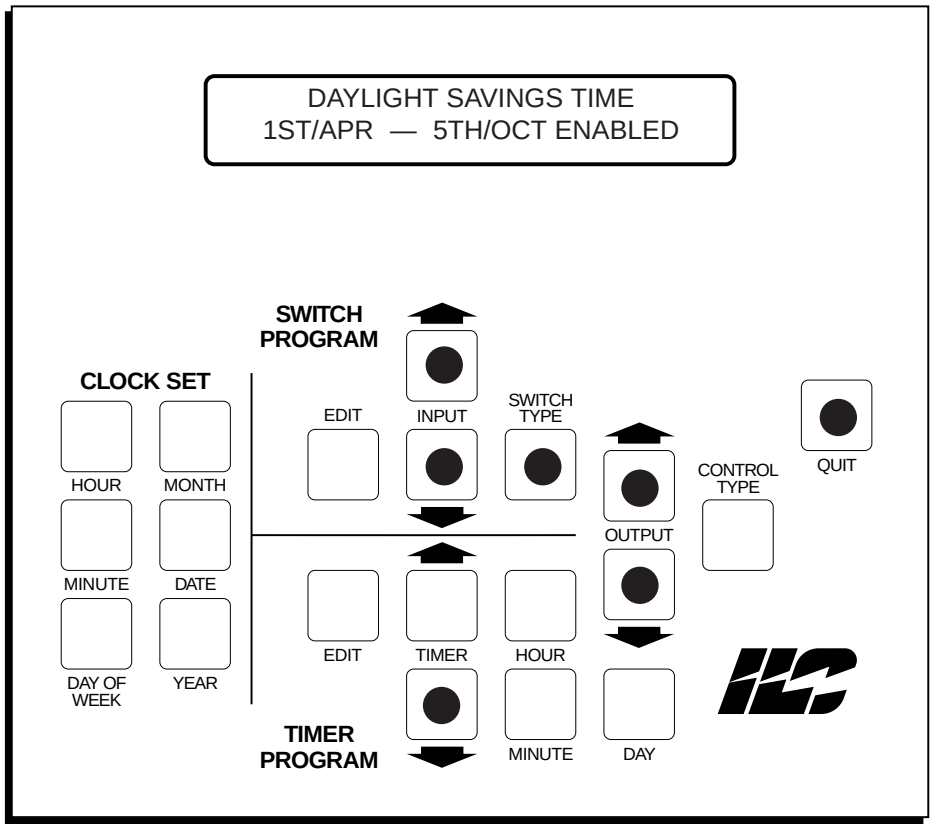


Figure 5-1 Daylight Savings

5.2 Programming The Power ON Settings - The controller default is to leave the relay outputs in the state they were in before application/re-application of controller power. This is the most common application and no programming for this purpose is required. However, if you want one or more of the relay outputs to assume a pre-determined state when power is applied or re-applied to the controller, consult Table 5-2 and Figure 5-2.

Table 5-2 Power ON Settings

Keys/Functions	Procedure	Comments/Examples
SWITCH TYPE accesses screen **OUTPUT ↓** accesses screen **OUTPUT ↑** scrolls outputs in descending order **OUTPUT ↓** scrolls outputs in ascending order **CONTROL TYPE** used to select power on state **QUIT** exit	**1.** Press **SWITCH TYPE** and **OUTPUT ↓** simultaneously to access the Power On Settings Screen. **2.** Press **OUTPUT ↓ or OUTPUT ↑** to select the Output to be programmed. **3.** Press **CONTROL TYPE** to select the state of the selected output when controller power-ups.	**Possible Output States:** **– No Action (default)** **– Turn On** **– Turn Off** **– On If In#1 On** **– Off If In#1 On** **Example:** Turn **Output 2 ON** when controller powers-up. **1.** Press **SWITCH TYPE** and **OUTPUT ↓** at the same time. **2.** Press **OUTPUT ↓** until **OUTPUT 002** appears. **3.** Press **CONTROL TYPE** until **Turn ON** appears. **4.** Press **QUIT** or let the controller time out.

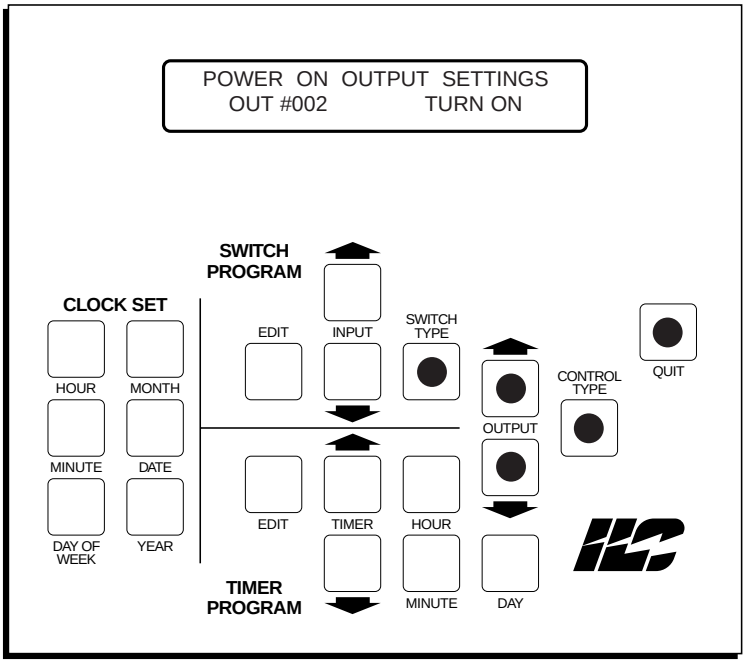


Figure 5-2 Power On Settings

5.3 Programming The Timer Output Type – If you define a timer control type as Off With Blink, you need to program the timer's **output type** as either a **normal blink alert**(see 2.2.6) or a **five second off pulse.** The **default** is normal blink. (Five second off pulse is a control mechanism used with Sentry switches.)

Table 5-3 Timer Output Type

Keys/Functions	Procedure	Comments/Examples
SWITCH TYPE accesses screen **HOUR** accesses screen **CONTROL TYPE** toggles between normal blink and five second Off pulse **OUTPUT ↑** scrolls outputs in descending order **OUTPUT ↓** scrolls outputs in ascending order **QUIT** exit screen	Press **SWITCH TYPE** and **HOUR** (in the timer area of the keypad) simultaneously. Press **OUTPUT ↓** or **OUTPUT ↑** to select the Relay to be programmed. Press **CONTROL TYPE** until timer is defined as the desired Timer Output Type	**Example:** **Define Relay #003 as a Five Second Off Pulse.** **1.** Press **SWITCH TYPE** and **HOUR** simultaneously. **2.** Press **OUTPUT ↓** until **OUT# 003** appears on the screen. **3.** Press **CONTROL TYPE** until **5 Second Off** appears on the screen. **4.** Press **QUIT** or let the controller time out.

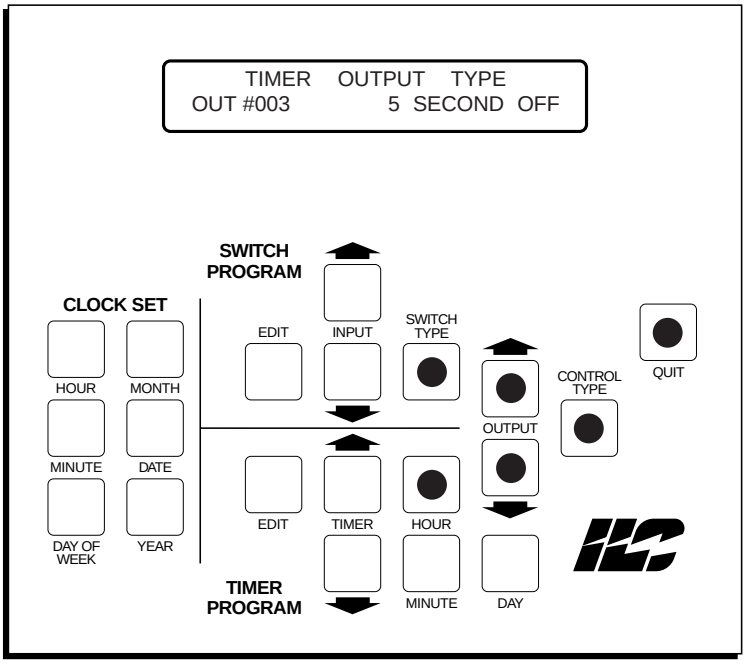


Figure 5-3 Timer Output Type

5.4 Astro Clock Operations – You have the option of defining timers in astro time (in relation to sunrise and sunset). Astro time is used when the time lighting is required varies seasonally. You have the option of defining a timer to occur exactly at sunrise or sunset or with an offset either before or after of 15, 30, 45, 60, 75, 90, 105, or 120 minutes. Ensure the proper settings of the Astro-Clock variables listed in Table 5-4 and Figure 5-4.

Table 5-4 Astro-Clock Variables

Keys/Functions	Procedure	Comments/Examples
TIMER ↑ accesses screen **MINUTE** accesses screen **INPUT** ↑ adjusts latitude upward **INPUT** ↓ adjusts latitude downward **OUTPUT** ↑ adjust longitude upward **OUTPUT** ↓ adjusts longitude downward **SWITCH TYPE** toggle to current daylight savings time status **CONTROL TYPE** sets Time Zone **QUIT** exits screen	**1.** Press **TIMER** ↑ and **MINUTE** (in the Timer area of the keypad) simultaneously. **2.** Press **INPUT** ↑ or **INPUT** ↓ to set the proper latitude of the controller location. **3.** Press **OUTPUT** ↑ or **OUTPUT** ↓ to set the proper longitude of the controller. **4.** Press **SWITCH TYPE** to set current daylight savings time status. **5.** Press **CONTROL TYPE** until the proper time zone for the controller is selected. **6.** Press **QUIT** to exit.	**Default latitude, longitude, and time zone settings are for Minneapolis, MN** **Example: Set the Astro-Clock Variables for 35 degrees latitude, 120 degrees longitude, Pacific time zone, daylight savings time current.** **1.** Press **TIMER** ↑ and **MINUTE** simultaneously. **2.** Press **INPUT** ↓ until **035** appears in the latitude field. **3.** Press **OUTPUT** ↑ until **120** appears in the longitude field. **4.** Press **SWITCH TYPE** until **Y** appears in Daylight Savings Time field. **5.** Press **CONTROL TYPE** until Pacific appears. **6.** Press **QUIT** or let the controller time out.

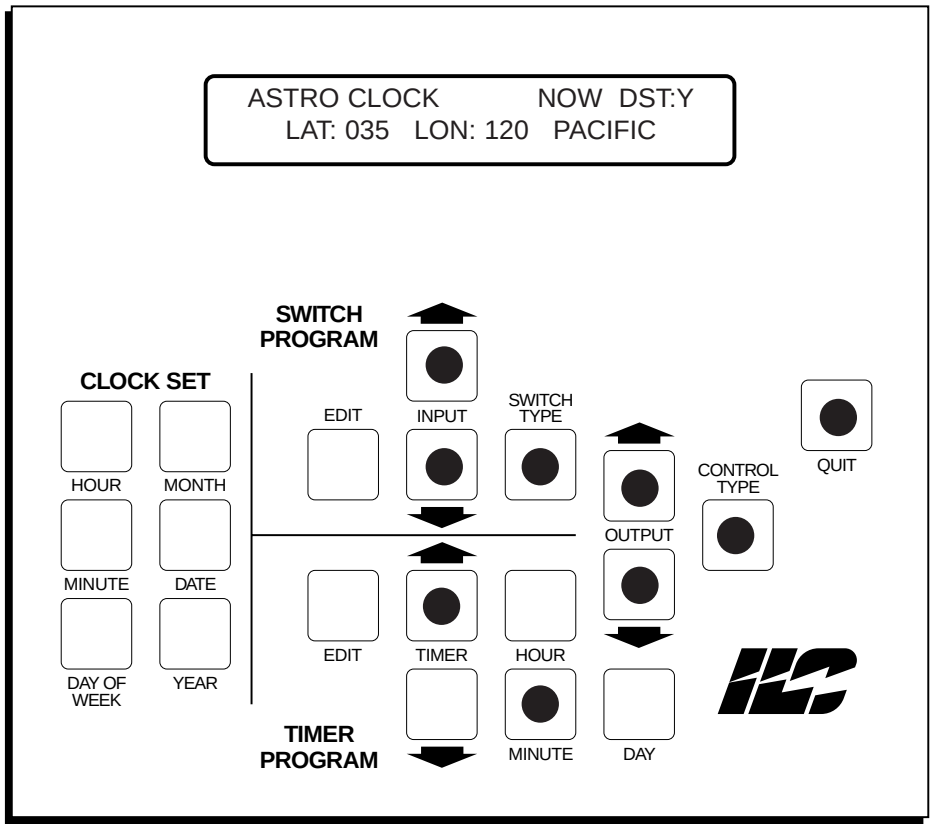


Figure 5-4 Astro-Clock Variables

After setting the Astro-Clock and Daylight Savings Time Variables, you can program timers in Astro Time.

Table 5-5 Astro Timer Programming

Keys/Functions	Procedure	Comments/Examples
EDIT (TIMER) accesses timer programming screen **TIMER ↑** scrolls timers in descending order **TIMER ↓** scrolls timers in ascending order **HOUR** scrolls the timer relationship to sunrise/sunset **DAY** sets day(s) on which timer is to be invoked **EDIT** (Yellow) toggles between normal and Astro Time **SWITCH TYPE** used to flag timer to ignore holidays **OUTPUT ↑** scrolls outputs in descending order **OUTPUT ↓** scrolls outputs in ascending order **CONTROL TYPE** sets output control type **QUIT** saves entries without waiting for controller time out.	**1. Press EDIT** (blue). **2. Press TIMER ↑** or **TIMER ↓** to accesses desired timer. **3. Press EDIT** (yellow) to toggle to **Astro time.** **4. Press HOUR** until desired Astro time appears. **5. Press DAY** until desired day(s) appear.Then if desired, press **SWITCH TYPE;** an I_H will appear indicating that the timer will ignore holidays. **6. Press OUTPUT ↓** or **OUTPUT ↑** until first output to be controlled appears. **7. Press CONTROL TYPE** until desired control type appears. **8. Repeat steps 6 & 7 to program additional outputs controlled by the timer.** **9. Repeat steps 2-8 to program additional timers.** **10. Press QUIT** or let the controller time out.	**Example:** Program timer 2 to turn output 2 ON and output 4 OFF at 15 minutes after sunrise, every day. **1. Press EDIT** (blue). **2. Press TIMER ↓** until TIMER 02 appears. **3. Press EDIT** (yellow) **to toggle to Astro Time** **4. Press DAY** until DAILY appears. **5. Press HOUR until SR+15 appears** **6. Press OUTPUT ↓** until OUT# 002 appears. **7. Press CONTROL TYPE** until ON CONTROL appears. **8. Press OUTPUT ↓** until OUT# 004 appears. **9. Press CONTROL TYPE** until OFF CONTROL appears. **10. Press QUIT** or let the controller time out.

Quick Reference

Timer = an ON/OFF signal generated at a certain point in time. Max. available # of TIMERS = 32.

Available Outputs: Up to 128 spanning a max. of 8 I/O cards

Control Options: Turn output(s) ON, Turn output(s) OFF, Off with Blink Alert, Output ignores holiday schedule.

Available Days: SUN, MON, TUE, WED, THUR, FRI, SAT, MON-FRI, SAT-SUN, DAILY, Holiday A or Holiday B

Astro Time Options: sunrise or up to 120 minutes before or after (in 15 minute increments); sunset or up to 120 minutes before or after)in 15 minute increments).

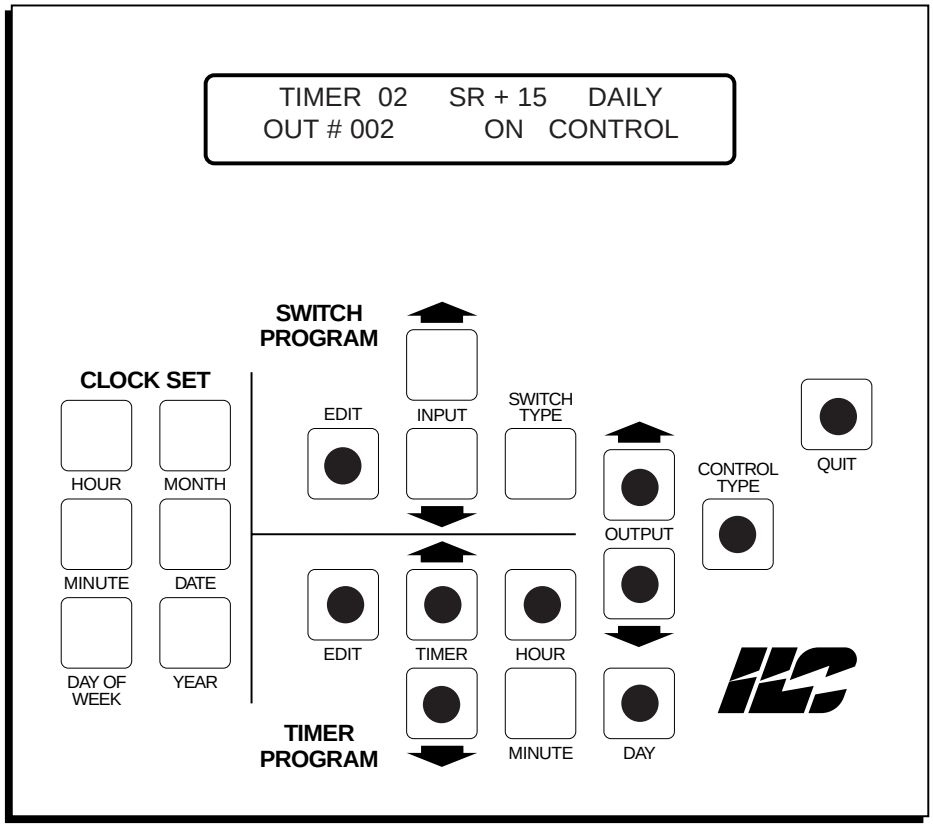


Figure 5-5 Astro-Timer Programming

5.6 Displaying The Controller Switch Inputs Status – You can check each switch input to display its current status. This is used to verify *maintained* switches.

Table 5-6 Switch Input Status

Keys/Functions	Procedure	Comments/Examples
SWITCH TYPE accesses screen **INPUT** ↑ accesses screen **INPUT** ↓ scrolls inputs in ascending order **INPUT** ↑ scrolls inputs in descending order **QUIT** exits screen	**1. Press SWITCH TYPE & INPUT** ↑ simultaneously. **2. Press INPUT** ↓ or **INPUT** ↑ to review the current status of each switch input. **3. Press QUIT** or let the controller time out	**Example: Check the status of switch input 004.** **1. Press SWITCH TYPE & INPUT** ↑ at the same time. **2. Press INPUT** ↓ three times to view input **004** current status. (0=No switch, 1=Switch ON, 2=Switch OFF, 3=Switch ON and OFF) **3. Press QUIT** or let the controller time out.

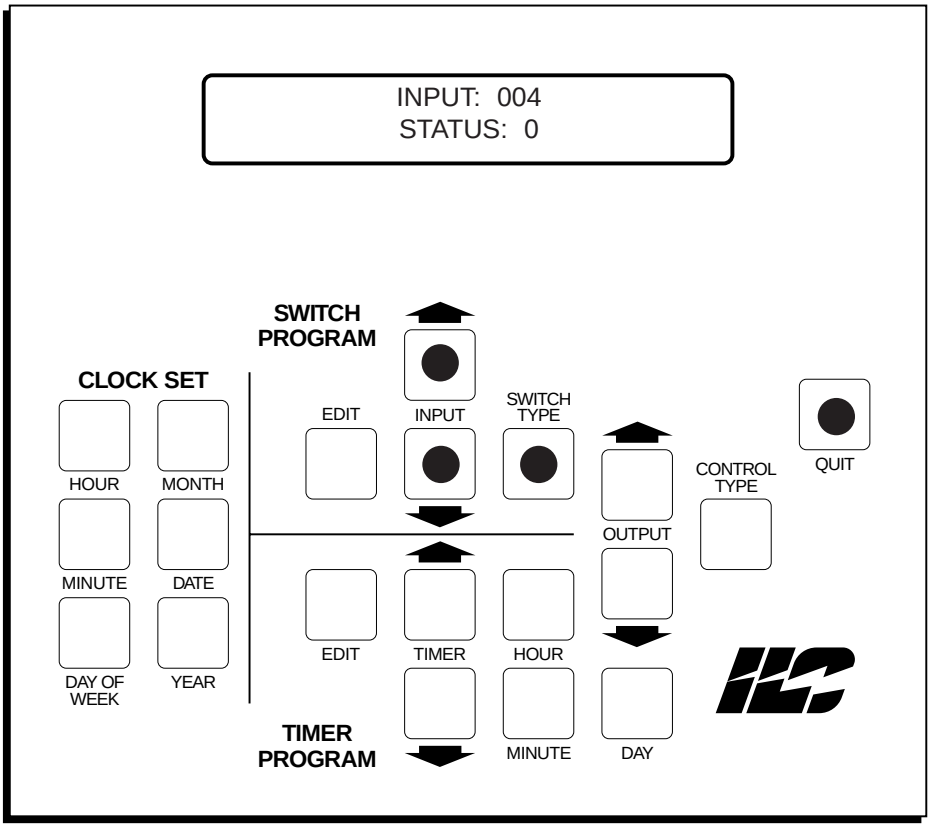


Figure 5-6 Switch Input Status

5.7 Displaying Relay Output Status - You can check the current status of each relay output and have the option of forcing a particular output ON or OFF.

Table 5-7 Relay Output Status

Keys/Functions	Procedure	Comments/Examples
SWITCH TYPE accesses screen **INPUT** ↓ accesses screen **OUTPUT** ↓ scrolls outputs in ascending order **OUTPUT** ↑ scrolls Outputs in descending order **INPUT** ↓ forces Output Off **INPUT** ↑ forces Output On **QUIT** exits screen	**1. Press SWITCH TYPE & INPUT** ↓ simultaneously. **2. Press OUTPUT** ↓ or **OUTPUT** ↑ to review the current status of each switch input. **3. Press INPUT** ↓ to force a given output **OFF** **4.Press INPUT** ↑ to force a given output **ON** **5. Press QUIT** or let the controller time out.	**Example: Check the status of relay output 004; then force it ON.** **1. Press SWITCH TYPE & INPUT** ↓ at the same time. **2. Press OUTPUT** ↓ three times to view **Relay 004** current status. **3. Press INPUT** ↑ to force the output **ON** **4. Press QUIT** or let the controller time out.

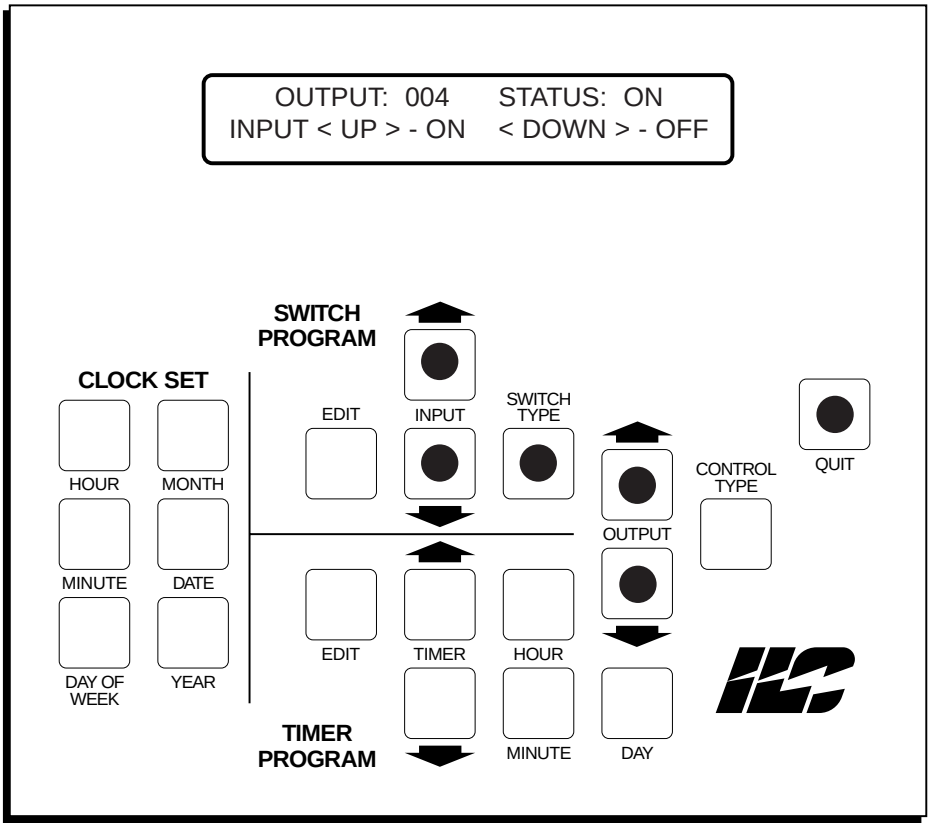


Figure 5-7 Displaying Relay Output Status

5.8 Displaying Current Firmware Revision – You can check the current controller firmware revision.

Table 5-8 Current Firmware Revision

Keys/Functions	Procedure	Comments/Examples
OUTPUT ↑ accesses screen **OUTPUT** ↓ accesses screen **QUIT** axits screen	**1. Press OUTPUT** ↑ **& OUTPUT** ↓ at the same time. **2. Press QUIT** to exit screen	**Knowing which revision is resident in the controller is important when seeking factory assistance.**

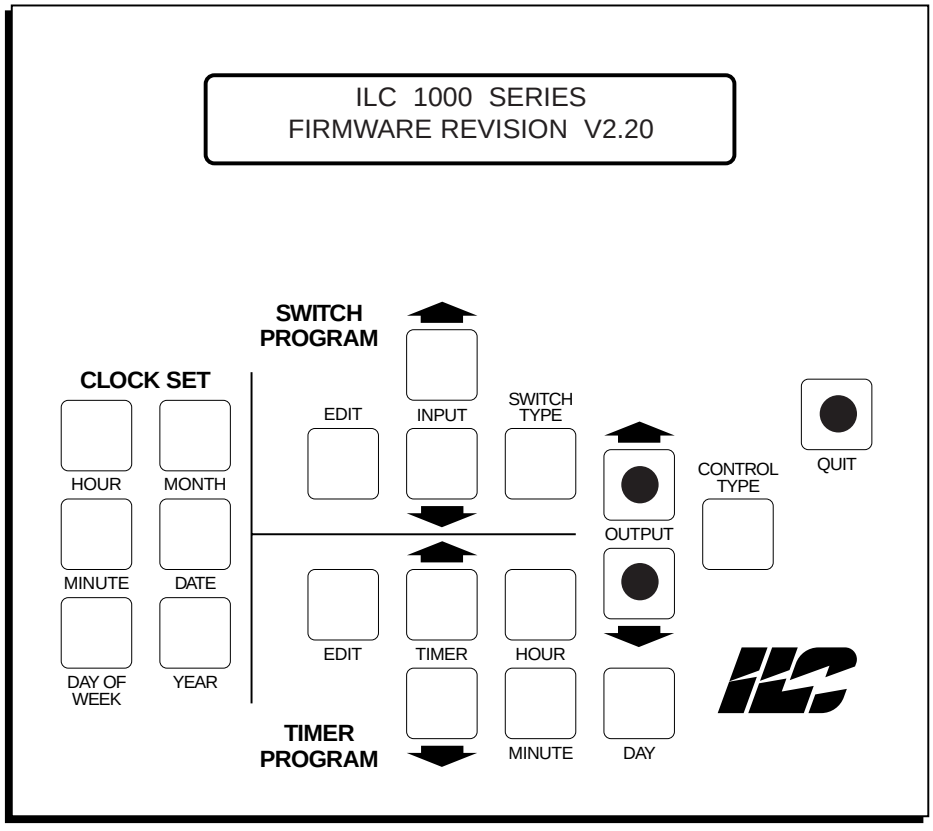


Figure 5-8 Displaying Firmware Revision

5.9 Resetting The Controller – If you are making extensive programming changes to a controller, you have the option of resetting the controller. **This will clear the controller memory of all entries and reset the arrays to their default values. However, this operation will not affect the controller clock. USE THIS OPTION ONLY IF YOU ARE PREPARED TO REPROGRAM THE CONTROLLER.**

Table 5-9 Controller Reset

Keys/Functions	Procedure	Comments/Examples
HOUR resets I/O arrays to defaults **MINUTE** resets I/O arrays to default **DAY OF WEEK** resets I/O arrays to default	**1.** Power down the controller w/ the power switch located on the CPU board. **2.** Hold down **HOUR, MINUTE, & DAY OF WEEK <u>while</u>** turning the power switch **ON.** **3.** Release the keys after message appearing in Figure 15 appears.	**This procedure will erase all entries for the switches, timers, holidays, Astro-settings, I/O Configuration but will not reset the currently programmed time and date.** **Use this procedure, if extensive programming is required for the controller.**

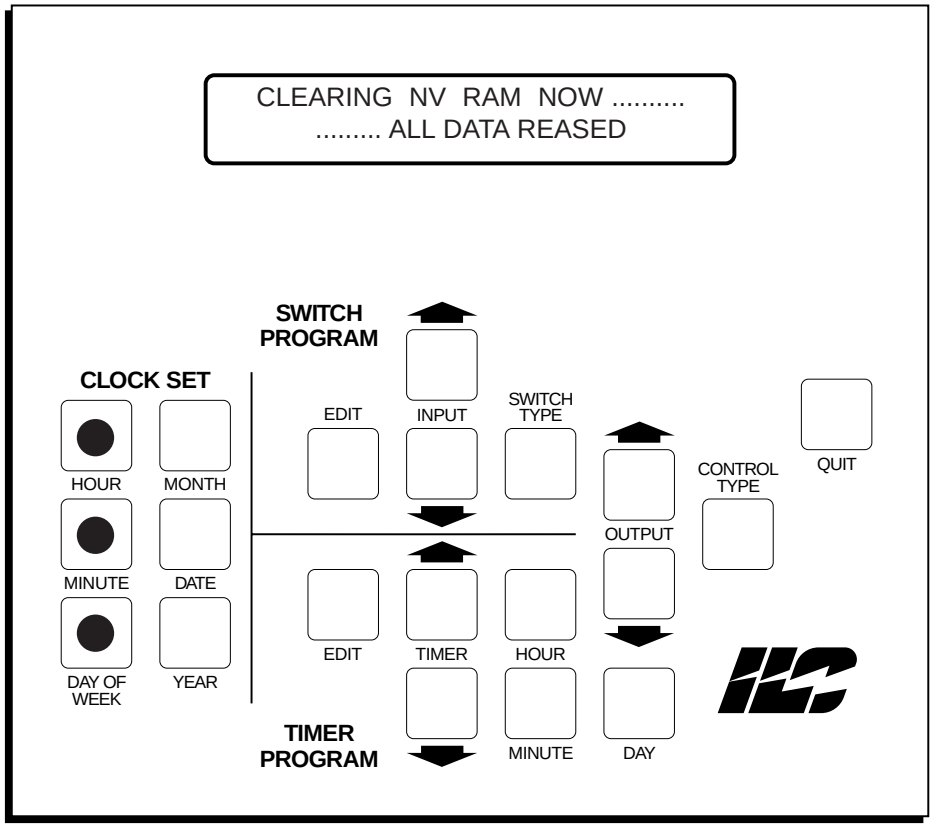


Figure 5-9 Controller Reset

Notes

Section 6

Communications and Networking

6.0 Section Overview - This section covers the following topics:

- Communicating with the **Quanta 1000** base unit via the on-board modem
- Communication and networking **RSX** equipped controllers
- The telephone switching feature of the **RSX** equipped controllers

Actual controller keypad entries are designated by **bold**.
Global Module programming procedures are covered in Section 7.

6.1 On site Communications Via On-Board Modem – Each **Quanta 1000** base unit model is equipped with an on-board, 1200 baud modem allowing on site programming. The programming is done off-line on a personal computer equipped with **ILC** proprietary software. The program is then downloaded to the controller over a direct connected phone cord from your computer's modem RJ11 phone jack to the controller's modem RJ11 phone jack. In addition a program already resident in a **Quanta 1000** can be uploaded and stored to a file on your personal computer. Consult the **ILCEDIT-Q User's Manual** for installation & user information.

6.1.1 Requirements – Your personal computer must be equipped with a 1200 baud modem and have **ILCEDIT-Q** software installed. Install a phone cord directly from your personal computer modem port to the controllers modem RJ11 phone jack. (See Figure 6-1.)

6.1.2 Procedure –

1. Load **ILCEDIT-Q** software. If downloading to a controller, program the software array the way the controller is to be programmed.
2. If connecting to a **Quanta 1000** controller with a detachable programming module, ensure that it is plugged into the controller.
3. Using **ILCEDIT-Q** set the proper DOS Time and Date.
4. Using **ILCEDIT-Q** software access the Communications Set-Up screen and choose the modem communications option. Also select the communications port on your computer.
5. Enter **1** for the phone number. When your modem dials out press the **INPUT** ↓ and **OUTPUT** ↓ **Quanta 1000** keys simultaneously to force the controller to answer.

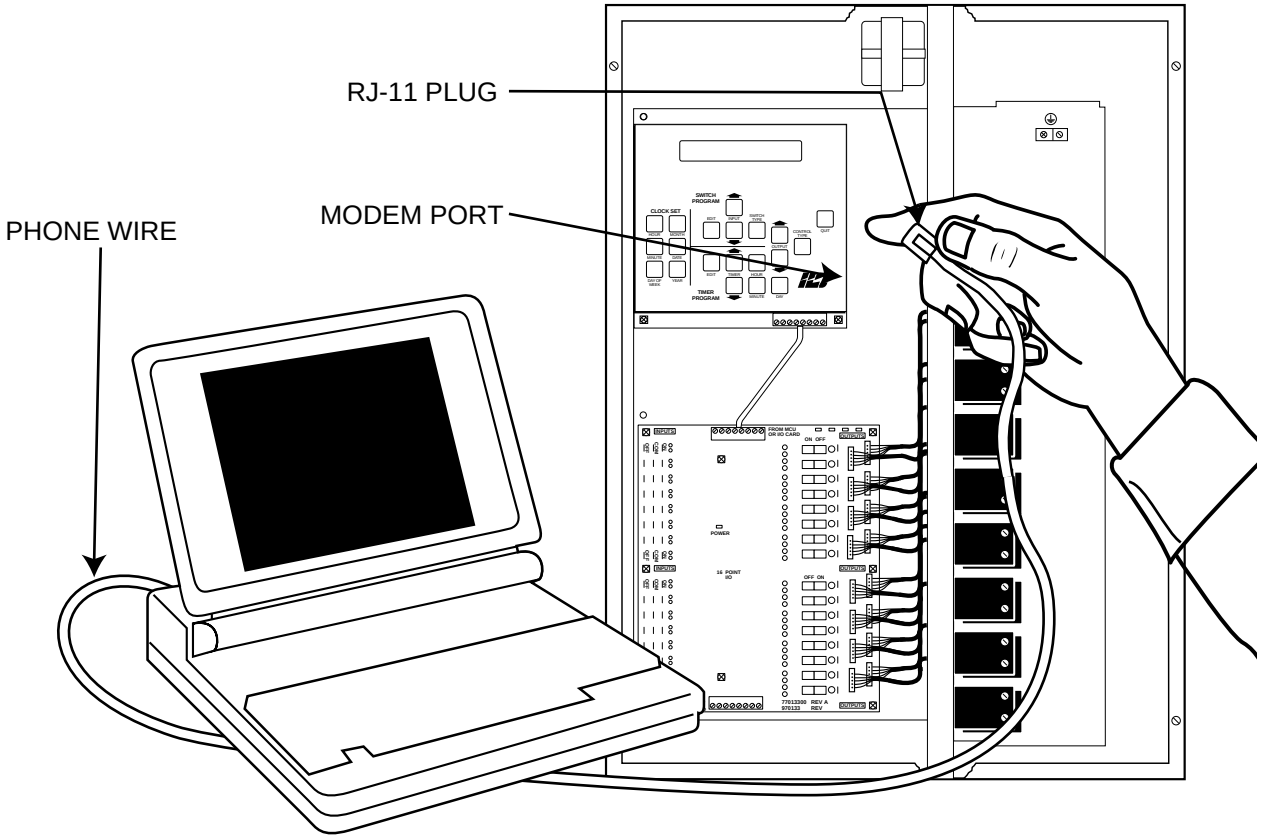


Figure 6-1 Direct Connect Modem Link

6.2 Remote Communications Via On-Board Modem – Each **Quanta 1000** base unit model is equipped with an on-board, 1200 baud modem allowing remote programming. The programming is done off-line on a personal computer equipped with **ILCEDIT-Q** proprietary software. The program is then downloaded to the controller over the phone. In addition, a program already resident in a **Quanta 1000** can be uploaded and stored to a file on your personal computer. Consult the **ILCEDIT-Q User's Manual** for installation & user information. Programming of **Quanta 1000** controllers from the **ILC** factory is offered as an option.

6.2.1 Requirements – To set up the controllers for remote programming: (See Figure 6-2)

- Install a phone outlet equipped with a RJ11 jack convenient to each **Quanta 1000** unit you want programmed.
- The remote computer must be equipped with **ILCEDIT-Q** and have a modem capable of 1200 baud communications.
- Connect the controller(s) to the phone jack(s) with a phone cord(s). The cord(s) terminates on the controller end(s) to a RJ11 jack(s) resident on the controller CPU board(s).

6.2.2 Procedure – To communicate with each **Quanta 1000** controller:

1. Load **ILCEDIT-Q** software. If downloading to a controller, program the software array the way the controller is to be programmed.
2. Using **ILCEDIT-Q** set the proper DOS Time and Date.
3. Using **ILCEDIT-Q** software access the Communications Set-Up screen and choose the modem communications option. Also select the communications port on your computer.
4. Enter the phone number and then press **<Enter>** to connect with the controller.

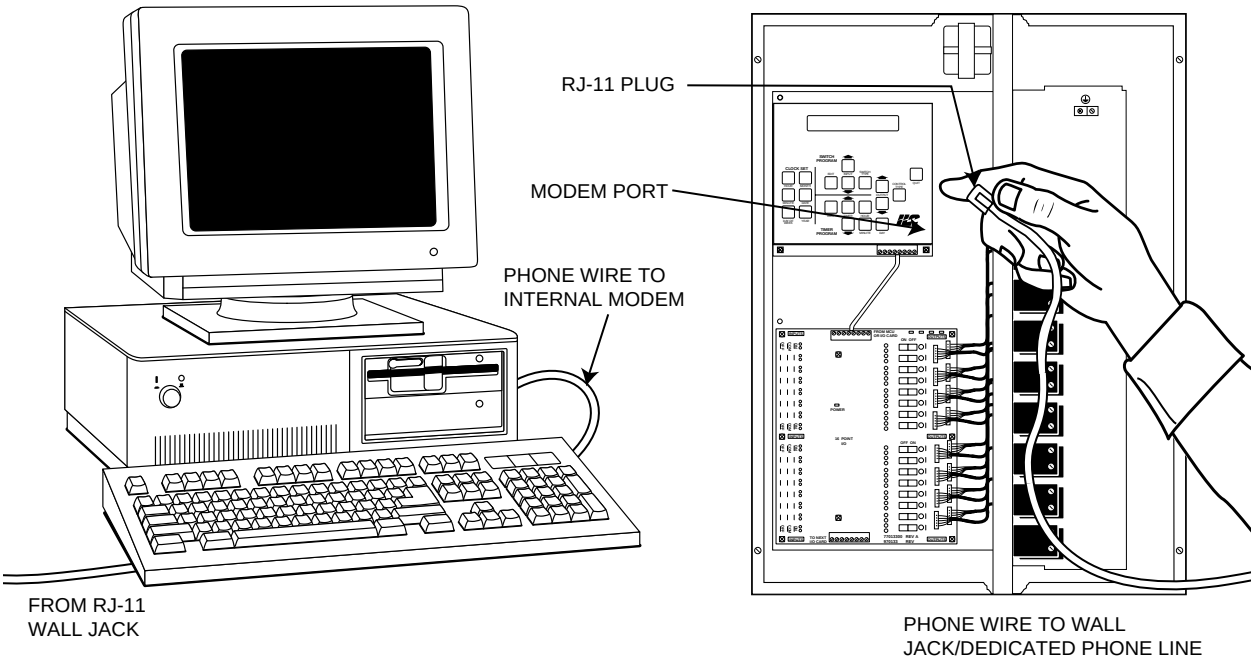


Figure 6-2 Remote Modem Link

If **ILC** is to program the controllers, provide the factory with the controller phone number(s), how you want the controller(s) programmed, then **fill out the programming worksheets for each controller you want programmed**.

ILC's address is:

5229 Edina Industrial Boulevard
Minneapolis, MN 55439

ILC's Phone numbers are:
Voice: (612) 829-1900
Fax: (612) 829-1901

Be sure the controller is powered up before requesting a factory download.

6.3 RSX Communication Options – **RSX** controllers are equipped with a **RS232/RS485** communications port on the CPU board as well as a DTMF interface. (See Figure 6-3.)

6.3.1 RS232 Operation – If you set the communications link jumpers for RS232 you can program the controller from a personal computer equipped with **ILCEDIT-Q** software either directly connected to the controller (see Figure 6-4) or over the phone via Hayes compatible modems (see Figure 6-5). The communication speed can be either 1200 or 4800 baud. The direct connect option requires a specially configured 9 pin cross over cable ordered from **ILC Corporation.** Phone communication requires a standard straight through 9 pin modem cable with a female connector on the controller end. If **direct connected**, to communicate:

1. Load **ILCEDIT-Q** software. If downloading to a controller, program the software array the way the controller is to be programmed.

2. Verify that the communications jumpers are set for RS232 communications. See Figure 6-3.

3. Using **ILCEDIT-Q** set the proper DOS Time and Date.

4. Using **ILCEDIT-Q** software, access the Communications Set-Up screen and choose the appropriate RSX RS232 option, and also select the communications port on your computer. Then connect to the controller.

If connected **via phones and modems**:

1. Load **ILCEDIT-Q** software. If downloading to a controller, program the software array the way the controller is to be programmed.

2. Verify that the communications jumpers are set for RS232 communications. See Figure 6-3.

3. Using **ILCEDIT-Q** set the proper DOS Time and Date.

4. Using **ILCEDIT-Q** software access the Communications Set-Up screen and choose the modem communications option. Also, select the communications port on your computer.

5. Enter the phone number and connect with the controller.

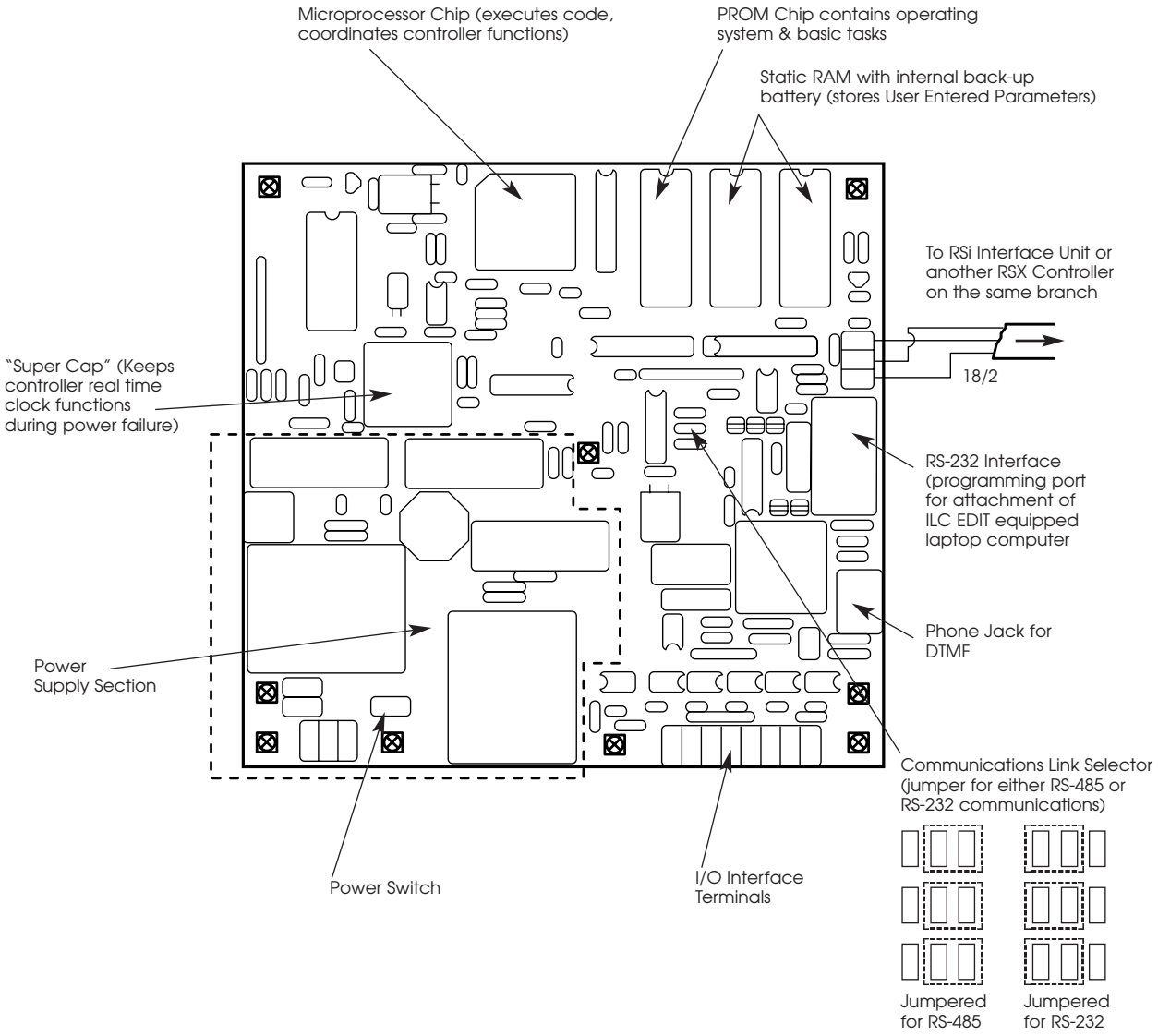


Figure 6-3 RSX Controller CPU Board

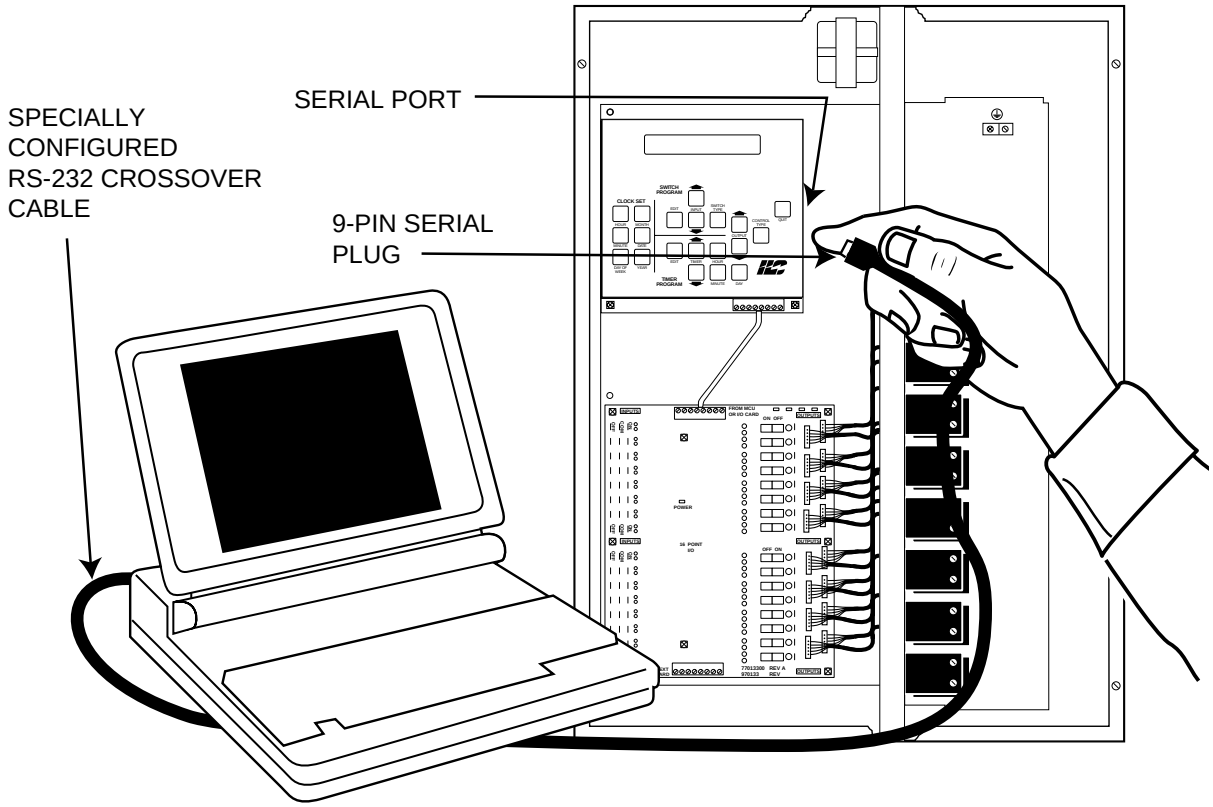


Figure 6-4 Direct Connected RSX Controller

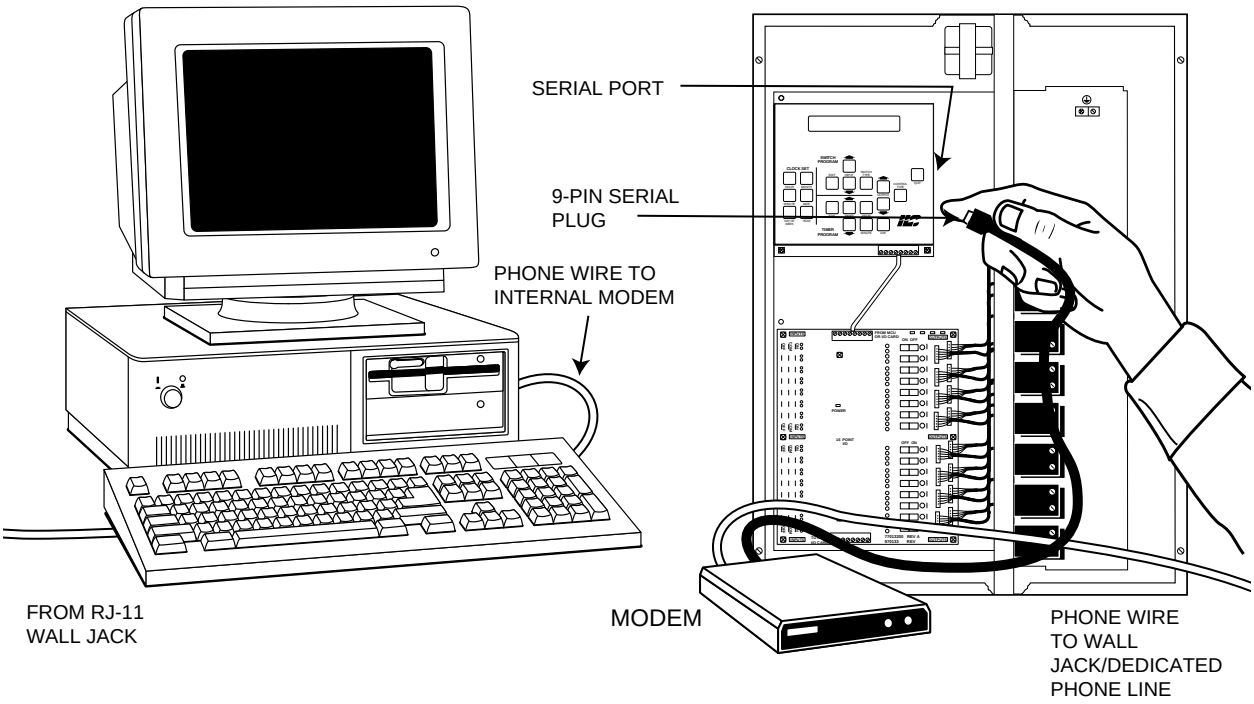


Figure 6-5 Phone/Modem Connected RSX Controller

6.3.2 RS485 Operation/Networking – If the controller communication link option jumpers are set for RS485 communication, **up to 128 controllers** can be networked via an **RS485 communications bus**.

6.3.3 Network Architecture – (See Figure 6-6) The controllers are daisy-chained on up to 4 branches (maximum **48** controllers per branch) with shielded two wire twisted pair cable. Each branch of the RS485 network is connected to one of 4 ports on an RS232/RS485 communications interface (**RSi** interface unit.) Each branch can be up to **5000 feet** long. Each **Quanta 1000** must be assigned a **unique** address 001-128). These node addresses are set at each controller via keyboard commands initiated from the on-board keypad or handheld programmer. The **RSi** interface unit features a COM: port which is connected by a specially configured 9 pin cross-over RS232 cable, provided by **ILC**, to a serial port on a personal computer equipped with **ILCEDIT-Q** software. Using **ILCEDIT-Q**, you can program and store control parameters for each controller residing on the RS485 link and download the parameters to each controller. The operator can also retrieve data from each controller on the RS485 bus.

6.3.4 Installation/Checkout Procedures - Apply power to the equipment only when instructed. In the following procedure actual controller keypad entries are designated by **bold**.

1. Link the controllers with the shielded twisted pair cable. Observe the guidelines/limits described in 6.3.3. Verify there are no shorts or opens in the cable.

2. Verify that the communications jumpers on each controller are set for RS485 communications. See Figure 6-3.

3. Run a dedicated 120 VAC circuit to the RSi unit.

4. Terminate the home runs of the twisted pair to the RSi ports.

5. Connect the RS232 cable between the RSi and a serial port on your **ILCEDIT-Q** equipped computer.

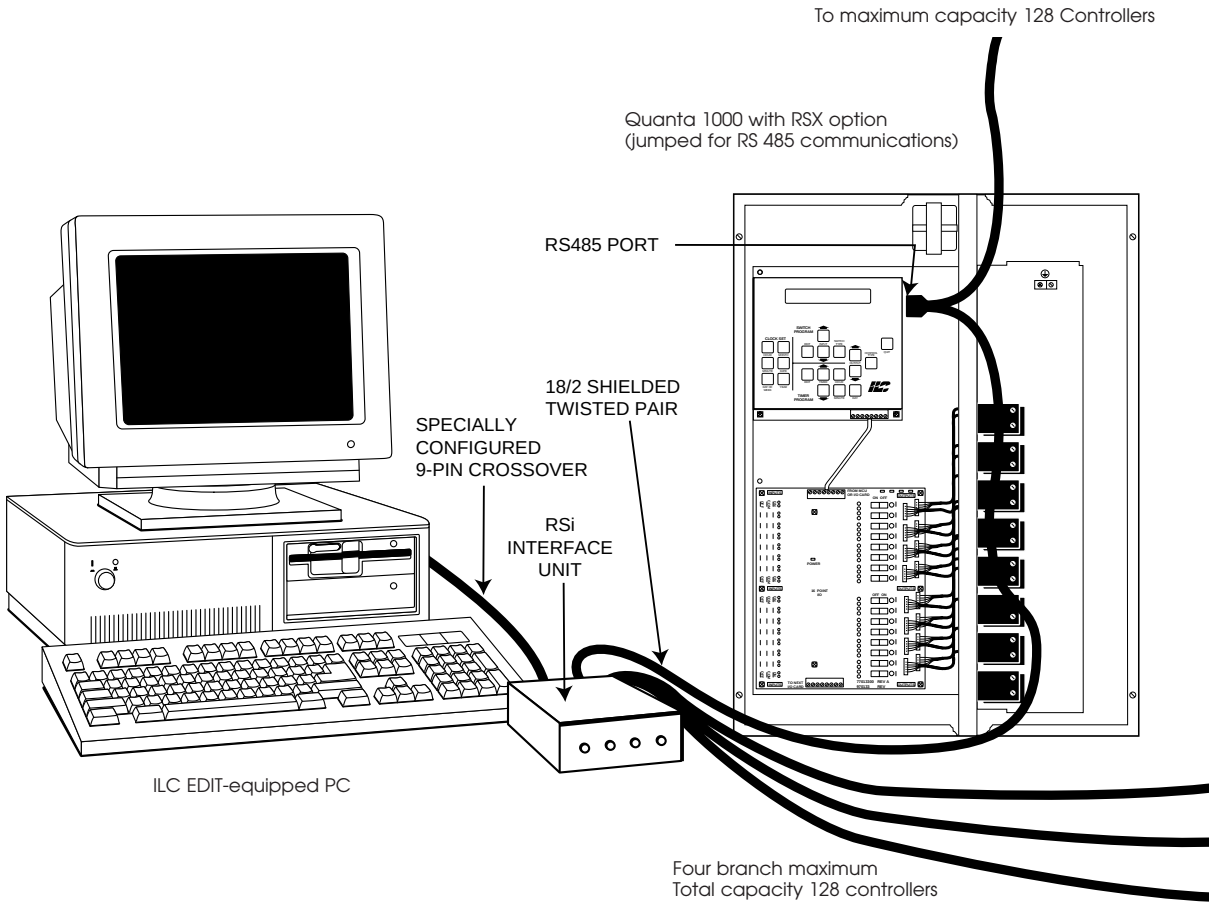


Figure 6-6 RS485 Network

6. Power-up each **Quanta 1000** and set its node address and communications speed. To set the address: press the yellow **SWITCH TYPE** and the green **CONTROL TYPE** simultaneously. Then press either the green **OUTPUT** ↓ or **OUTPUT** ↑ keys as required to set the node address. Then press the tan **QUIT** key or let the controller time out. **Remember to assign a given address to only one controller.** To set the communications speed: press the green **CONTROL TYPE** and the tan **QUIT** keys simultaneously. Then toggle the yellow **EDIT** key to set the baud rate to either 1200 or 4800. **Be sure that all controllers are set for the same baud rate.**When you have finished setting communications speed, press **QUIT** or let the controller time out.

7. Power-up the **RSi** and your personal computer.

8. Load the **QUANTA-WIN** program. Consult the **QUANTA-WIN User's Manual** for details.

9. Using **QUANTA-WIN** set the proper DOS Time and Date.

10. Using **QUANTA-WIN** software access the Communications Set-Up screen and choose the appropriate RS485 option. Also select the communications port on your computer.

11. Connect with each controller and verify communications by retrieving the current firmware revision and time/date from the controller.

6.4 LAN Up-Grade – By substituting a **Global Module Interface** for the RSi unit, (see Figure 6-7) you can upgrade the passive RS485 network to perform certain Local Area Network (LAN functions). In order to take advantage of the system upgrades supported by the **Global Module**, you need to understand how a **LAN** differs from a passive RS485 network and the concept of global events especially global switching.

A passive RS485 network is a communications mechanism between your **QUANTA-WIN** equipped computer and the connected **Quanta 1000** controllers. You can communicate with each controller on an individual basis but each controller operates in stand alone fashion executing the control parameters loaded into its firmware independent of the operation of the other controllers.

With the **LAN** upgrade, each controller will continue the independent execution of the control parameters loaded into its firmware. However, the **Global Module** acting as a network processor and coordinator, supports the application of certain control parameters on a network wide or multi-controller basis. You download these parameters from your personal computer to the **Global Module**. Once entered into the **Global Module**, the parameters will be executed as long as the **Global Module** is active.

6.5 Global Events/Holidays: Global events can be either switch, timer, or phone code parameters loaded into the **Global Module**. For example, if time based scheduling is the same for all the controllers, the required timer parameters can be programmed into the **Global Module** and will be implemented by each of the controllers via the **LAN** thus removing the need to individually program timer parameters into each controller. Holiday parameters can also be implemented via the **LAN**. **Global Switching** is a common control strategy used in **LAN** applications. A switch is hardwired to the input of one controller which will not only control specified outputs in that controller but will also impact designated outputs in any of the controllers in the **LAN**. Remember that all **LAN** based operations are depended on the operation of the Global Module. If this device becomes inactive, **all LAN based control will cease.**

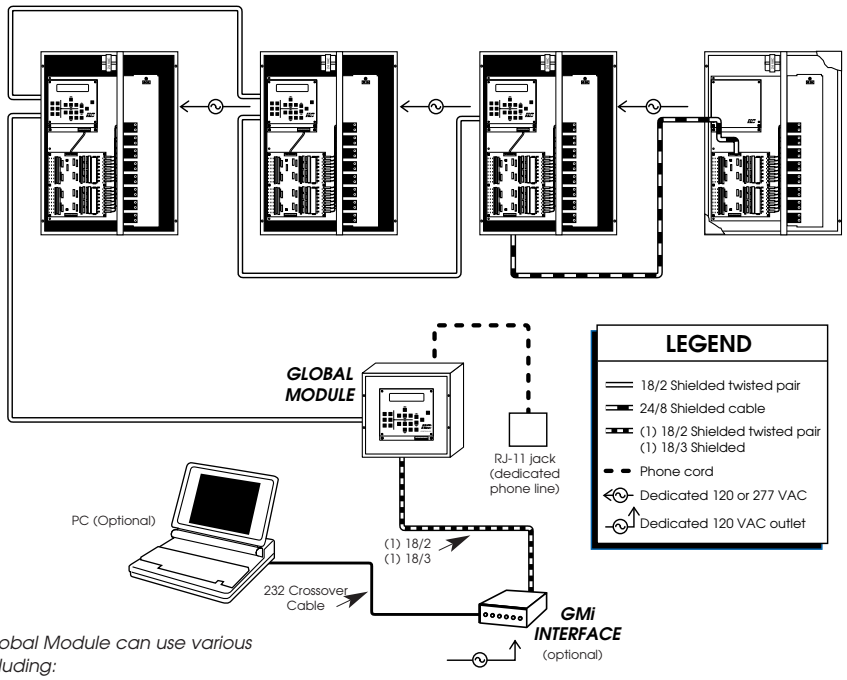
6.6 LAN Network Limits: The maximum number of controllers which can be LAN upgraded is a function of the number of controllers (nodes) and the number of outputs per node (based on the controller with the most outputs). See Matrix 6-1.

NOTE: As a basic guideline, networks with 10 or less controllers can use a Global Module. A network with 11 or more controllers should upgrade to a Level 3 system.

Notes

1. Link multiple Quanta RSX Controllers
2. Link Quanta RSX controllers in a single, continuous line, up to 5,000 feet. Controllers must be daisy chained as shown.
3. Global Switching (without a dedicated central PC) can be initiated from any controller, at any location in the network to control an unlimited number of relays.

   Global inputs may be a standard wall switch, but the Global Input may also be a:
   - ■ Timer Function
   - ■ Astro Clock Function
   - ■ Telephone switch group (up to 64 Global telephone switch groups)
4. Programming acheived with:
   - ■ Keypad
   - ■ Laptop PC
   - ■ Palmtop PC
   - ■ Desktop PC



The ILC Global Module can use various inputs, including:

Clock Timers *Astro Timers* *Phone* *Switch*

Figure 6-7 Global Module Interface

	Outputs per Node															
Nodes	**8**	**16**	**24**	**32**	**40**	**48**	**56**	**64**	**72**	**80**	**88**	**96**	**104**	**112**	**120**	**128**
2	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
4	64	64	64	64	64	64	64	64	64	64	64	64	59	54	51	48
6	64	64	64	64	64	64	64	64	56	51	46	42	39	36	34	32
8	64	64	64	64	64	64	64	48	42	38	34	32	29	27	25	24
10	64	64	64	64	61	51	43	38	34	30	27	25	23	21	20	19
Global Module recommended																
Level 3 recommended																
12	64	64	64	64	51	42	36	32	28	25	23	21	19	18	17	16
14	64	64	64	54	43	36	31	27	24	21	19	18	16	15	14	13
16	64	64	64	48	38	32	27	24	21	19	17	16	14	13	12	12
18	64	64	56	42	34	28	24	21	18	17	15	14	13	12	11	10
20	64	64	51	38	30	25	21	19	17	15	13	12	11	10	10	9
22	64	64	46	34	27	23	19	17	15	13	12	11	10	9	9	8
24	64	64	42	32	25	21	18	16	14	12	11	10	9	9	8	8
26	64	59	39	29	23	19	16	14	13	11	10	9	9	8	7	7
28	64	54	36	27	21	18	15	13	12	10	9	9	8	7	7	6
30	64	51	34	25	20	17	14	12	11	10	9	8	7	7	6	6
32	64	48	32	24	19	16	13	12	10	9	8	8	7	6	6	6
34	64	45	30	22	18	15	12	11	10	9	8	7	6	6	6	5
36	64	42	28	21	17	14	12	10	9	8	7	7	6	6	5	5
38	64	40	26	20	16	13	11	10	8	8	7	6	6	5	5	5
40	64	38	25	19	15	12	10	9	8	7	6	6	5	5	5	4

Matrix 6-1 Maximum LAN Nodes

6.6 Telephone Switching – The **Quanta 1000** controllers with the RSX option can perform limited telephone switching of the relay outputs via an onboard **DTMF port** (see Figure 6-3). A phone cord plugs into the port and connects to a phone outlet assigned a **dedicated** phone number. When you call the controller with a touch tone phone, it will answer on the **first ring and beep five times**. You then enter switching commands from the phone keypad. The controller will **hang up** if you have not made an entry for **10 seconds** or when the total length of the call has reached **one minute.** During phone link the controller processing of other array functions is suspended.

You can issue the following commands to a RSX equipped controller:

- To turn OFF a relay - enter the relay number (1-128) then press *****.
- To turn ON a relay - enter the relay number (1-128) then press **#**.
- To turn OFF all the relays - enter **201*** .
- To turn ON all the relays - enter **201#** .
- To force the controller to hang up - enter **200*** .

Example: Call up the controller at extension 123 and turn relay 41 ON.

1. Pick up the handset on the phone and enter **123** .
2. When the controller answers with 5 beeps, enter **41#.** (the controller responds with 2 beeps).
3. Hang up.

Notes

Section 7

Global Module Programming

7.0 Section Overview – This section covers **Global Module** programming procedures. Topics covered are:

- Global Module Keypad and Screen
- Configuring The LAN
- Setting The Global Module Clock
- Programming Global Events
- Programming Holidays
- Setting Astro-Clock Variables

Before attempting to program the Global Module, you must fill out the Global Module worksheet. (See Figure 7-1)

Quanta Global Module Worksheet

PROJECT: *AJAX BUILDING* CONTROLLER: *01*

GLOBAL NUMBER (1-64)	INPUTS			OUTPUTS		DESCRIPTION
	TIME	PHONE (1-99)	NODE SWITCH #	NODE	RELAYS	
1	6:00A			01 04	6,7 10,11	East and West Entry Lights
2			NODE 001 Switch 05	01 06	1-3 4-6	North and South Halls
3		01		02 03	12-15 8-11	Shipping Receiving

*Please see the Switch Input Type Reference sheet for Input types that may be used as Global Switch Input.

NOTE: Duplicate this form to document all Switch Input Control.

INTELLIGENT LIGHTING CONTROLS, INC.
5229 Edina Industrial Boulevard
Minneapolis. Minnesota 55439
Phone 612 829 1900
FAX 612 829 1901
1-800-922-8004

Figure 7-1 Sample Global Module Worksheet

Quanta Global Module Worksheet

PROJECT: _____ CONTROLLER: _____

GLOBAL NUMBER (1-64)	INPUTS			OUTPUTS		DESCRIPTION
	TIME	PHONE (1-99)	NODE SWITCH #	NODE	RELAYS	

*Please see the Switch Input Type Reference sheet for Input types that may be used as Global Switch Input.

NOTE: Duplicate this form to document all Switch Input Control.

INTELLIGENT LIGHTING CONTROLS, INC.
5229 Edina Industrial Boulevard
Minneapolis. Minnesota 55439
Phone 612 829 1900
FAX 612 829 1901
1-800-922-8004

7.1 Global Module Keypad/Screen – The keypad and screen is similar but not identical to the **Quanta 1000** programming module. See Figure 7-2. It is integral to the **Global Module** controller and consists of a tactile response keypad and two line, 24 character per line LCD display. The controller can also be programmed via its RS485/RS232 port with a personal computer equipped with **ILCEDIT-Q** networking software.

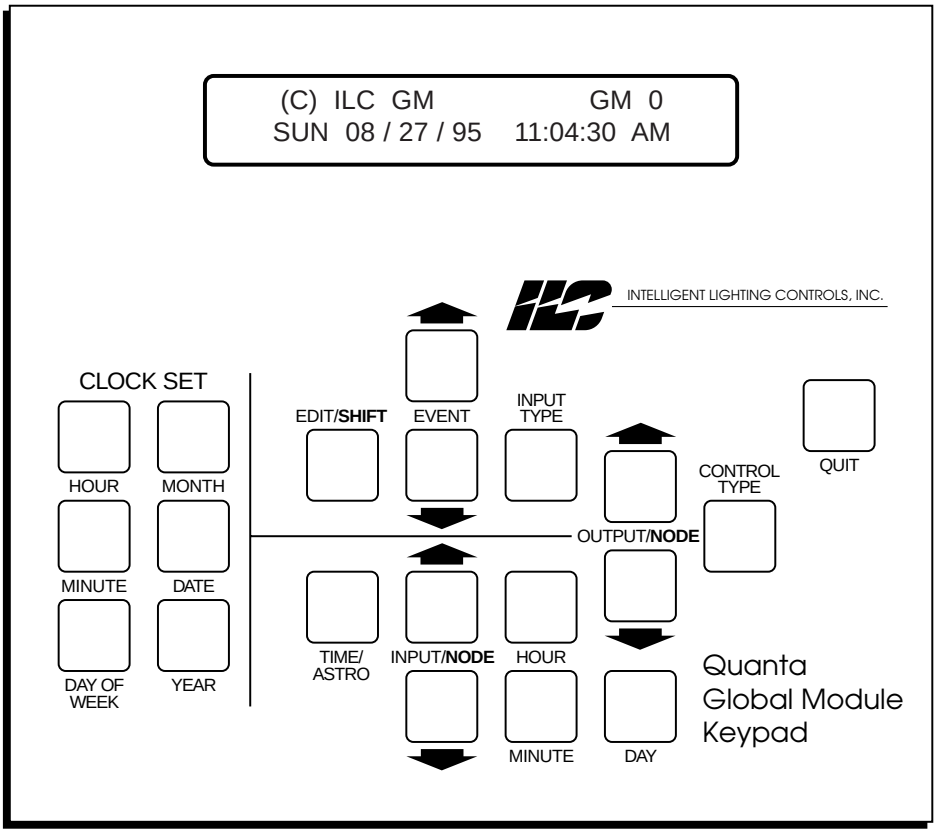


Figure 7-2 Global Module Screen/Keypad

7.2 Configuring the LAN - At initial system power-up you must define the number of nodes (**Quanta 1000** controllers) in the LAN and enter the number of outputs in the most heavily populated controller. Complete the following procedure to configure the LAN:

1. Ensure the **Global Module** is powered down.

2. Hold down the tan **HOUR**, **MINUTE**, and **DAY OF WEEK** keys and switch ON the power switch located near the lower left corner of the Global Module CPU board. A message will appear on the screen indicating the NVRAM memory has been cleared.

3. Release the three keys. The screen shown in Figure 7-3 will appear. Enter the number of outputs resident in the controller containing the most outputs by pressing the green **OUTPUT/NODE** ↑ key the required number of times.

4. Press the yellow **EDIT/SHIFT** key and the green **OUTPUT** ↑ the required number of times to set the number of nodes. (The number of nodes increments by 2. Set the number of nodes that includes and comes closest to the maximum number of nodes in the system. For example, if there are 7 nodes, set the system for 8.)

5. Press **QUIT** or let the controller time out. The **Home** screen will appear featuring the default time and date.

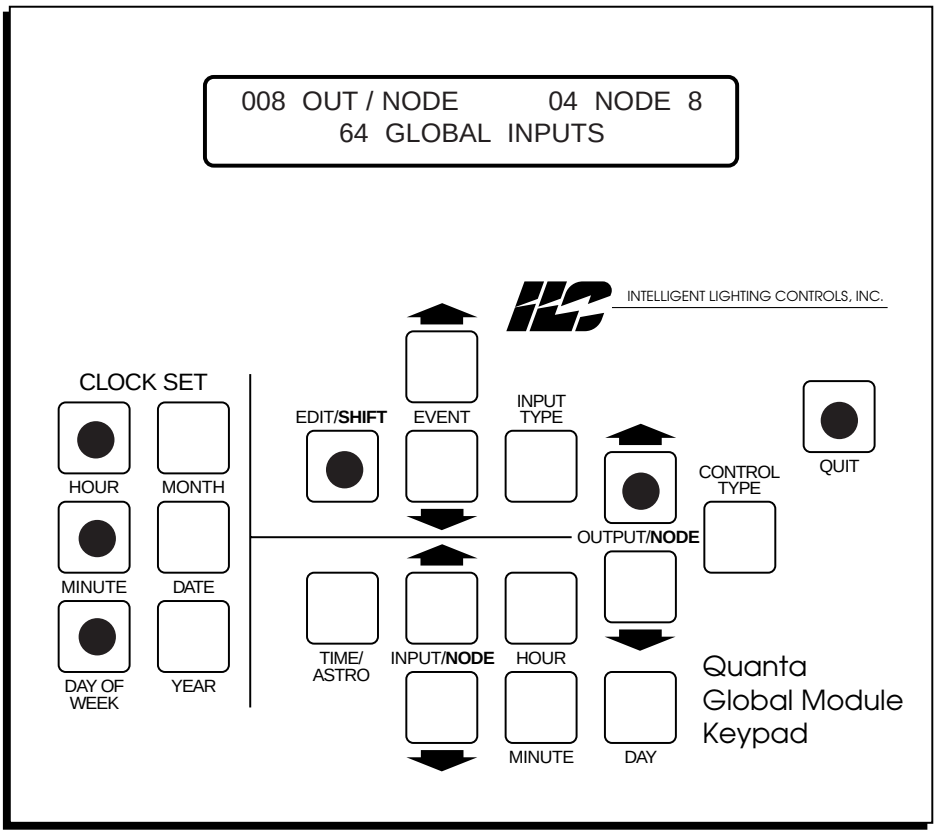


Figure 7-3 LAN Configuration Screen

7.3 Setting The Global Module Clock – Set the controller's clock from the **Home** screen by pressing any one of the tan keys in the **CLOCK SET** section of the keypad. Then set the current date and time using the keys in this section in the same manner you would in setting the time/date on a **Quanta 1000**. See Table 4-3.

If you wish to configure and enable daylight savings time, press the yellow **EVENT** ↑ and the blue **INPUT/NODE** ↓ simultaneously to access the daylight savings screen. Then set the start and ending dates. Press the yellow **EVENT** ↑ and **EVENT** ↓ keys as required to set the start date. Then press the green **OUTPUT/NODE** ↑ and **OUTPUT/NODE** ↓ keys as required to set the end date. Press the yellow **INPUT TYPE** key to enable daylight savings.

7.4 Programming Global Events – A Global Event can be one of the following:

- a momentary switch
- a maintained switch
- a timer (either conventional or astro time)
- phone code; (When you call the phone number of the **Global Module** and enter the 2 digit code; the programmed outputs will react.)

See Tables 7-1 through 7-3 and Figures 7-3 through 7-5 for procedures and examples.

Table 7-1 Global Event Programming, Global Switching

Keys/Functions		Procedure	Comments/Examples
EDIT/SHIFT	accesses screen	**1. Press EDIT/SHIFT** to access the global event screen.	**Example: Define Global Event 02 as a momentary switch in input 002 of controller 03. The switch turns outputs 004 and 005 in controller 002 ON/OFF**
EVENT ↓	scrolls global events in ascending order.	**2. Press EVENT** ↓ until the desired event number appears in the global event field.	**1. Press EDIT/SHIFT**
EVENT ↑	scrolls global events in descending order.	**3. Press INPUT TYPE** the required number of times to select either Momentary or Maintained switch.	**2. Press EVENT** ↓ until 02 appears in the global event field.
INPUT TYPE	defines the type of global event.	**4. Hold down EDIT/SHIFT and press INPUT/NODE** ↓ the required number of times to select the input node containing the switch input.	**3. Press INPUT TYPE** until **MOMEN** appears in the input type field.
EDIT/SHIFT and INPUT/NODE	sets Input Node housing hardwired switch.	**5. Press either INPUT** ↓ or **INPUT** ↑ to select the input to which the switch is connected.	**4. Hold down the EDIT/SHIFT** key and press **INPUT/NODE** ↓ **until 03** appears in the input node field
INPUT ↓	scrolls through inputs in ascending order.	**6. Hold down EDIT/SHIFT** and press **OUTPUT/NODE** ↑ the required number of times to select the output node containing the controlled output(s).	**5. Press INPUT** ↓ **until 002** appears in the input field.
INPUT ↑	scrolls Inputs in descending order.	**7. Press OUTPUT** ↓ **or OUTPUT** ↑ to select the output(s) to be controlled.	**6. Hold down the EDIT/SHIFT** key and press **OUTPUT/NODE** ↓ until **02** appears in the output node field.
EDIT/SHIFT and OUTPUT/NODE	sets Output Node housing the outputs impacted by the global switch.	**8. Press CONTROL TYPE** the required number of times to set the selected output's control type.	**7. Press OUTPUT** ↓ **until 004** appears in the output field
OUTPUT ↓	scrolls outputs in ascending order.	**9. Press QUIT or let the Global Module time out.**	**8. Press CONTROL TYPE** until **ON & OFF** appears in the **CONTROL TYPE** field.
OUTPUT ↑	scrolls outputs in descending order.		**9. Press OUTPUT** ↓ until **005** appears in the output field
CONTROL TYPE	sets control type of the selected output.		**10. Press CONTROL TYPE** until **ON & OFF** appears in the **CONTROL TYPE** field.
QUIT	returns to the Home screen.		**11. Press QUIT or let the Global Module time out.**

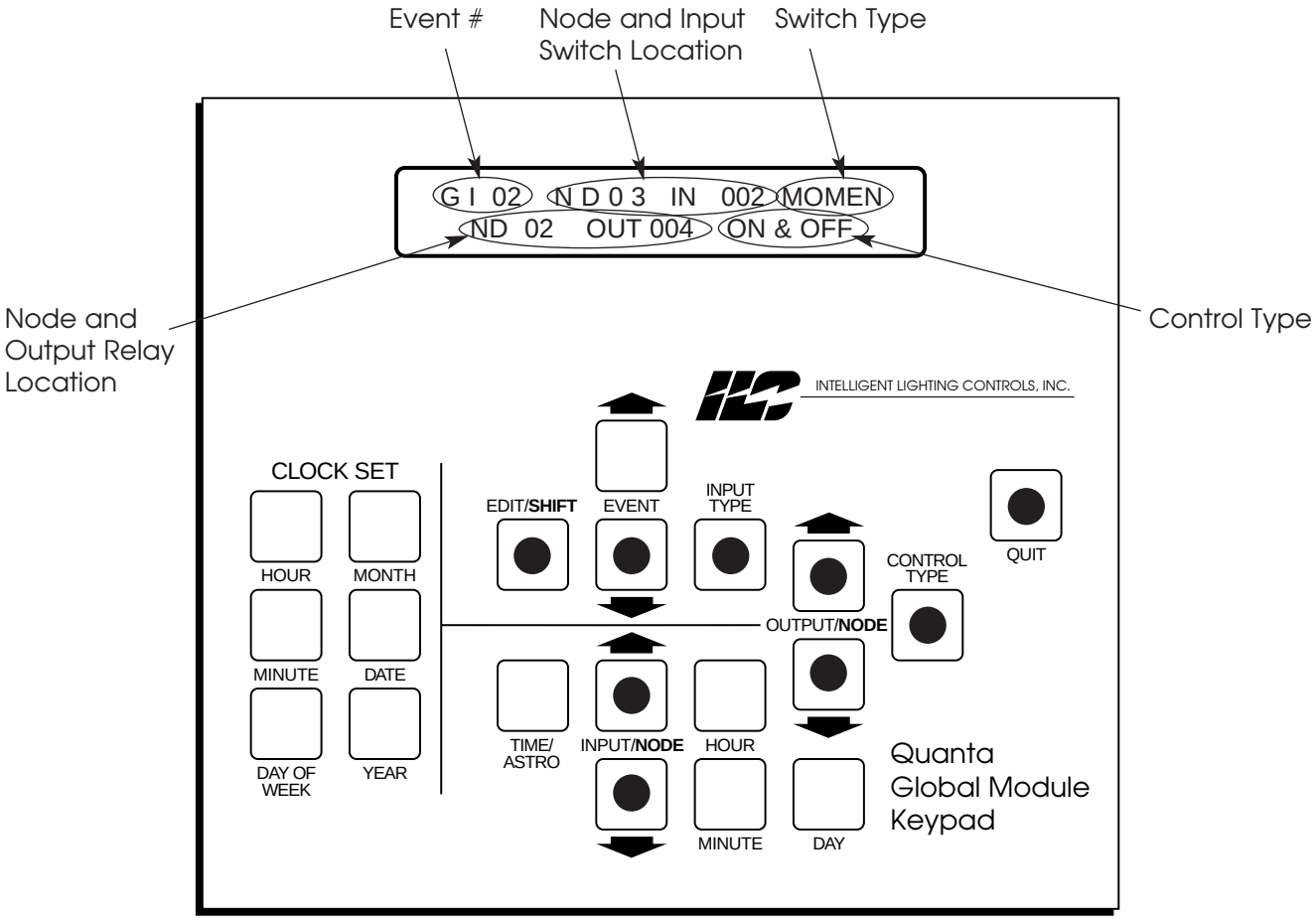


Figure 7-4 Global Switching

Table 7-2 Global Event Programming, Timer

Keys/Functions		Procedure	Comments/Examples
EDIT/SHIFT	accesses screen	**1. Press EDIT/SHIFT** to access the global event screen.	**Example: Define Global event 03 as a timer which will turn ON output 002 in controller 06 and output 003 in controller 07 at 6:30 AM, Monday-Friday. Set the timer to ignore holidays.**
EVENT ↓	scrolls global events in ascending order	**2. Press EVENT** ↓ until the desired event number appears in the global event field	**1. Press EDIT/SHIFT**
EVENT ↑	scrolls global events in descending order	**3. Press INPUT TYPE** the required number of times until the default timer day, **OK** appears.	**2. Press EVENT** ↓ until **03** appears in the global event field
INPUT TYPE	defines the type of global event	**4. Press TIME/ASTRO** until the desired time format is selected.	**3. Press INPUT TYPE** until **SUN** appears in the day field.
HOUR	sets hour of timer occurrence or if in Astro time the timer relationship to sunrise/ sunset	**5. Press the HOUR** and **MINUTE** keys as required to set the occurrence time of the global timer.	**4. Press DAY** until **MON-FRI** appears.
MINUTE	sets minute of timer occurrence	**6. Press DAY** to set the desired day(s) the timer is to occur on. Then if desired, press **INPUT/NODE;** an **I_H** will appear indicating that the timer will ignore holidays	**5. Press INPUT/NODE** so that the timer will ignore holidays.
DAY	sets day(s) on which timer is to be invoked	**7. Hold down EDIT/SHIFT** and press **OUTPUT/NODE** ↑ the required number of times to select the output node containing the controlled output(s).	**6. Press HOUR** until **06:00A** appears
TIME/ASTRO	toggles between normal and Astro Time	**8. Press OUTPUT** ↓ **or OUTPUT** ↑ to select the output(s) to be controlled.	**7. Press MINUTE** until **06:30A** appears
INPUT/NODE	used to flag timer to ignore holidays	**9. Press CONTROL TYPE** the required number of times to set the selected output's control type.	**8. Hold down the EDIT/SHIFT** key and press **OUTPUT/NODE** ↓ until **06** appears in the output node field
EDIT/SHIFT and OUTPUT/NODE	sets Node housing the outputs impacted by the timer	**10. Press QUIT** or let the Global Module time out.	**9. Press OUTPUT** ↓ until **002** appears in the output field
OUTPUT ↓	scrolls outputs in ascending order		**10. Press CONTROL TYPE** until **TURN ON** appears in the **CONTROL TYPE** field.
OUTPUT ↑	scrolls outputs in descending order		**11. Hold down the EDIT/SHIFT** key and press **OUTPUT/NODE** ↓ until **07** appears in the output node field
CONTROL TYPE	sets control type of the selected output		**12. Press OUTPUT** ↓ until **003** appears in the output field
QUIT	saves entries and returns to the Home screen		**13. Press CONTROL TYPE** until **TURN ON** appears in the **CONTROL TYPE** field.
			14. Press QUIT or let the Global Module Time out.

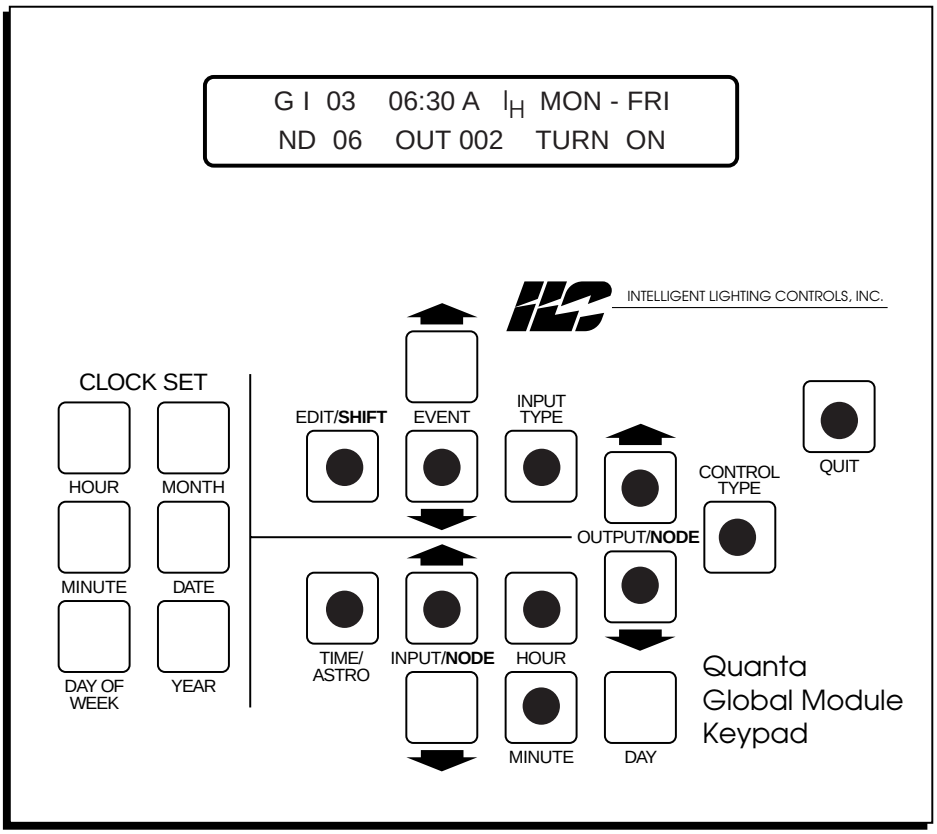


Figure 7-5 Global Timer

Table 7-3 Global Event Programming, Phone Code

Keys/Functions		Procedure	Comments/Examples
EDIT/SHIFT	accesses screen	**1. Press EDIT/SHIFT** to access the global event screen.	**Example: Define Global event 04 as Phone Code 01 which will turn ON/OFF output 008 in controller 05.**
EVENT ↓	scrolls global events in ascending order	**2. Press EVENT** ↓ until the desired event number appears in the global event field	**1. Press EDIT/SHIFT**
EVENT ↑	scrolls global events in descending order	**3. Press INPUT TYPE** the required number of times until the default **Phone Code 00** appears.	**2. Press EVENT** ↓ until **04** appears in the global event field
INPUT TYPE	defines the type of global event	**4. Press INPUT/NODE** ↓ or **INPUT/ NODE** ↑ to enter the desired Phone Code	**3. Press INPUT TYPE** until **00** appears in the Phone Code field.
INPUT ↓	scrolls Phone Codes in ascending order	**5. Hold down EDIT/SHIFT** and press **OUTPUT/NODE** ↑ the required number of times to select the output node containing the controlled output(s).	**4. Press INPUT/NODE** ↓ until **01** appears in the Phone Code field
INPUT ↑	scrolls Phone Codes in descending order	**6. Press OUTPUT** ↓ or **OUTPUT** ↑ to select the output(s) to be controlled.	**5. Hold down the EDIT/SHIFT** key and press **OUTPUT/NODE** ↓ until **05** appears in the output node field
EDIT/SHIFT and OUTPUT/NODE	sets Node housing the outputs impacted by the Phone Code	**7. Press CONTROL TYPE** the required number of times to set the selected output's control type.	**6. Press OUTPUT** ↓ until **008** appears in the output field
OUTPUT ↓	scrolls outputs in ascending order	**8. Press QUIT or let the Global Module time out.**	**9. Press CONTROL TYPE** until **ON & OFF** appears in the **CONTROL TYPE** field.
OUTPUT ↑	scrolls outputs in descending order		**12. Press QUIT or let the Global Module time out.**
CONTROL TYPE	sets control type of the selected output		
QUIT	returns to the Home screen.		

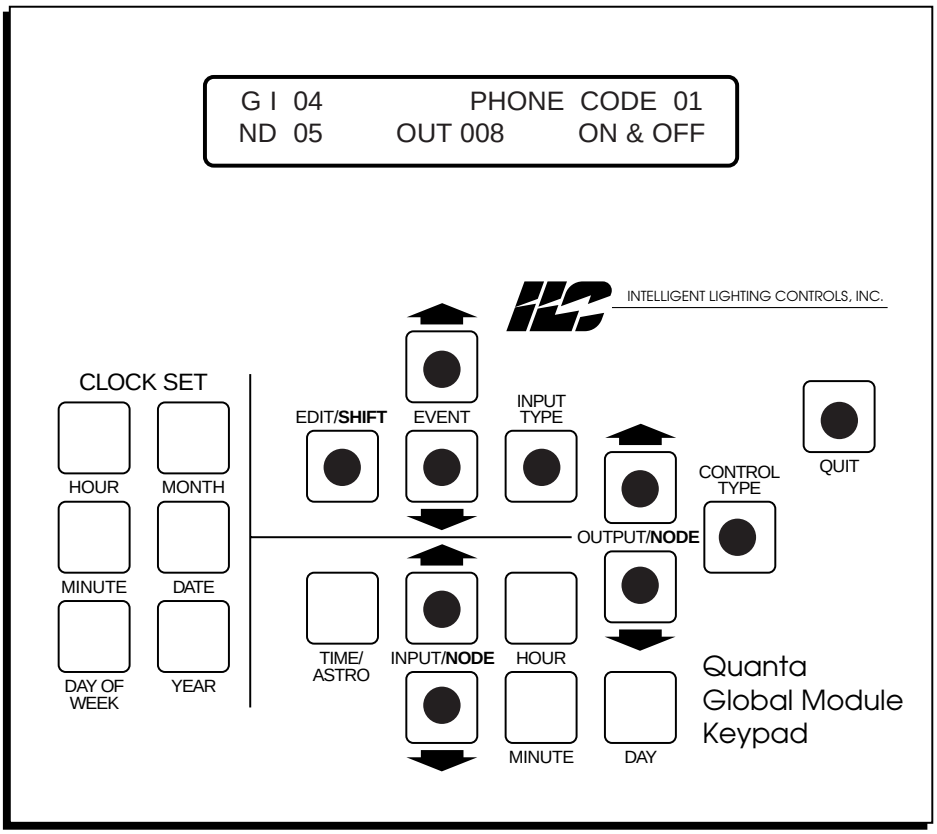


Figure 7-6 Global Event, Phone Code

7.5 Programming Holidays – Programming the Global Module for Holidays is similar to holiday programming for the **Quanta 1000** controller. (See Table 4-6 in Section 4.) To program a Holiday:

1. From the Home Screen, press the blue **INPUT/NODE** ↓ and **DAY** keys simultaneously.

2. Press the green **OUTPUT/NODE** ↓ to scroll to the holiday number you wish to program.

3. Press the tan **MONTH** key the required number of times to select the proper month.

4. Press the tan **DATE** key the required number of times to select the proper date.

5. Toggle the green **CONTROL TYPE** key to define the Holiday as either a Type A or Type B.

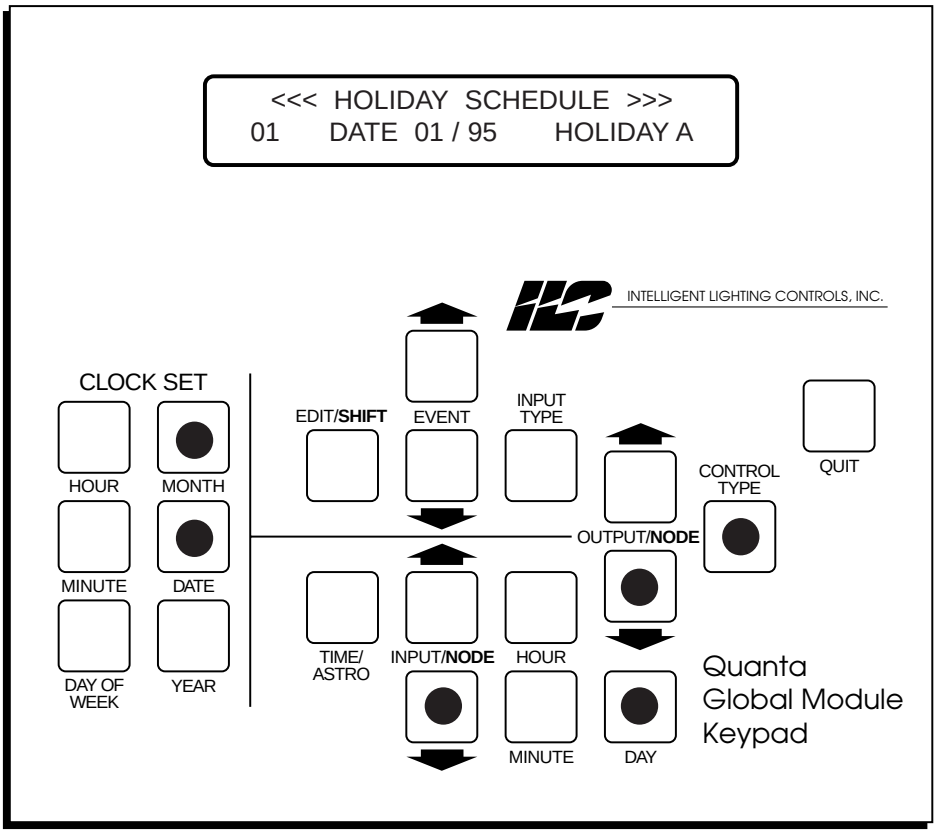


Figure 7-7 Holiday Screen

7.6 Setting Astro-Clock Variables – If any of the programmed global events use Astro-Time you will need to set the Global Module Astro-Clock variables. The procedure is similar to setting Quanta 1000 Astro-Clock variables.

1. Press the blue **INPUT/NODE** ↑ and **MINUTE** keys simultaneously to assess the Astro-Clock variables screen.

2. Press the yellow **EVENT** ↑ or **EVENT** ↓ keys the required number of times to adjust the Latitude.

3. Press the green **OUTPUT/NODE** ↑ or **OUTPUT/NODE** ↓ keys the required number of times to adjust the longitude.

4. Press the green **CONTROL TYPE** key until the proper time zone is set.

5. Press the yellow **INPUT TYPE** : Y=Yes, it it presently DST (Daylight Savings Time) (summer); N=No, it is not presently Daylight Savings Time.

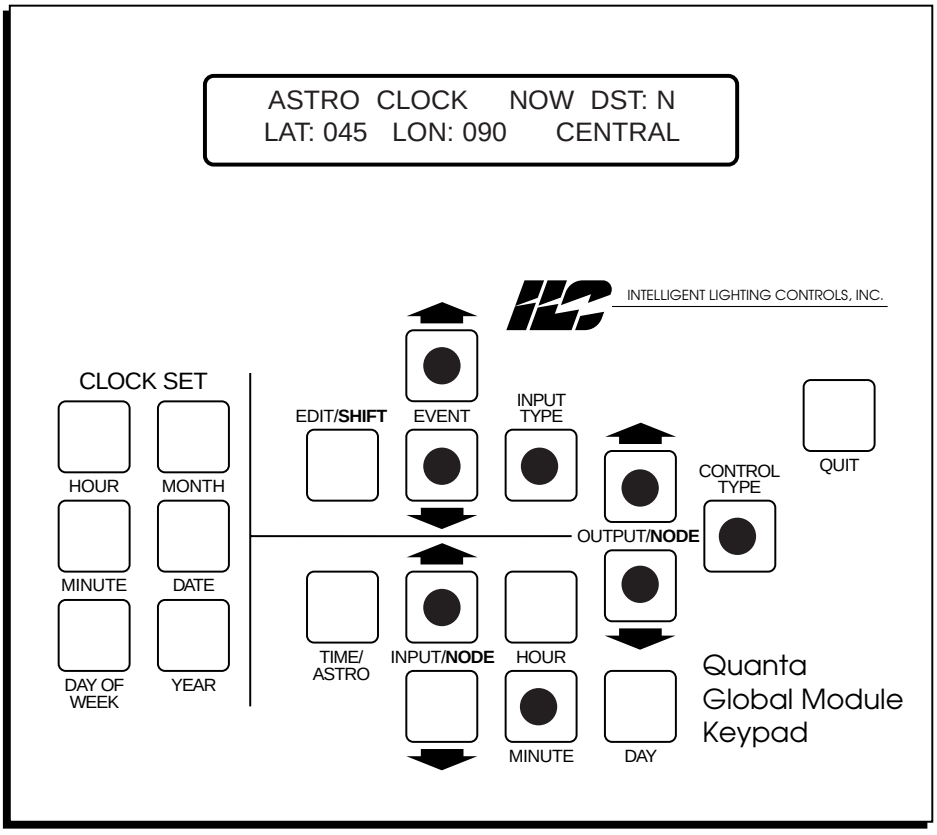


Figure 7-8 Astro-Clock Variables Screen

Notes

Section 8

DMX Operations

8.0 Section Overview - This section of the manual details the Quanta 1000 controller DMX option. DMX features and programming operations covered are:

- Control concepts
- Programming procedures

8.1 Control Concepts - The DMX features support the control of undimmed loads via command signals (USITT protocol) from a DMX-512 control console. The interface mechanism is a twisted pair link between the control console and the controller's RSX/DMX interface. (See Figure 8-1.)

8.1.1 Addressing – You can define from 1 to 64 consecutive controller switch inputs as DMX addresses. The starting address being anywhere between 1 and 512. When the switch input receives a command from the DMX-512 console, the relay outputs assigned to that input will react. The maximum number of programmable relay outputs of a DMX equipped controller is 96.

8.1.2 Command Signals – Program the following parameters at the controller:

- **ON** - When the DMX signal level rises to this level (default 60%) the relay outputs controlled by that address (switch input) turn on. However they may react to signals received by other sources such as field switches.

- **LOCK ON** - When the DMX signal level rises above this level (default 100%) the relay outputs controlled by that address (DMX input) remain on and will not react to other DMX inputs to which they are normally subject.

- **OFF** - When the DMX signal level falls to this level (default 40%) the relay outputs controlled by that address (DMX input) turn off.

- **LOCK OFF** - When the DMX signal level falls below this level (default 0%) the relay outputs controlled by that address (DMX input) remain off and will not react to other DMX inputs to which they are normally subject.

8.1.3 DMX Signal Disable - You have the option to program the controller so that if switch input 1 is closed all DMX command signals will be disabled.

8.1.4 Command Response Time - The controller is defaulted to implement a 50 msec. delay between each relay output's response to an ON/OFF command (sweep mode). You can program the controller so that it will not implement this delay but instead instantaneously turn on/off the impacted relay outputs.

8.2 Programming Procedures: In order to implement the DMX control features you have to perform the programming procedures detailed in Tables 8-1 through 8-3 and Figures 8-2 through 8-4. The operations are:

- Configure the DMX addresses
- Set the DMX signal levels
- Program the relay outputs and control type for each DMX input.

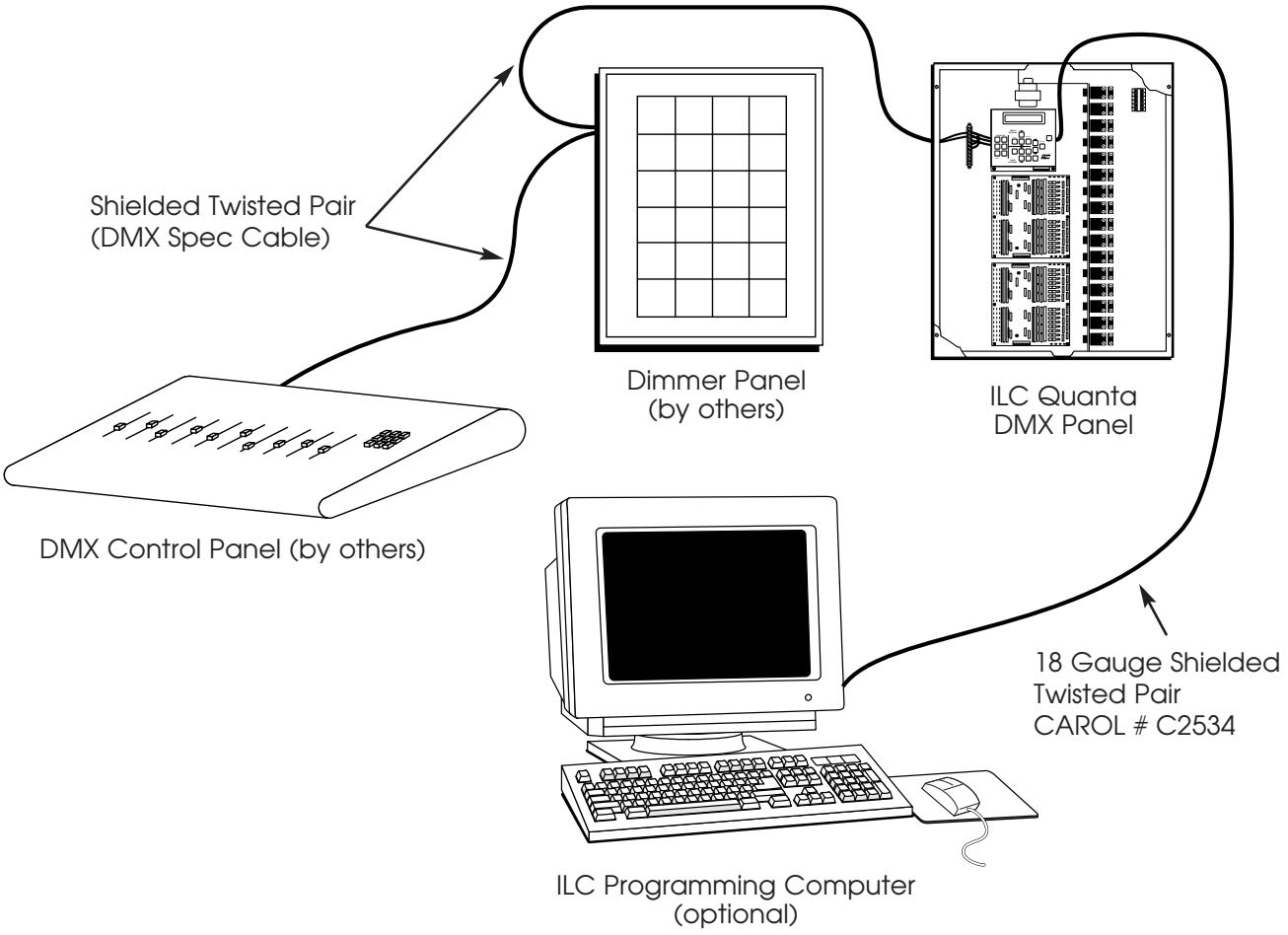


Figure 8-1 DMX-512 to RSX/DMX Controller Link

Table 8-1 Configure The DMX Addresses

Keys/Functions		Procedure	Comments/Examples
HOUR (blue)	Accesses Configuration screen	1. Press the blue **HOUR** and **MINUTE** keys simultaneously to access the DMX address configuration screen.	Example: Define the starting DMX address as 021 and the address range as 21 through 39. Set the relay output response for instantaneous and input 1 normal operation. Assume you are starting from controller defaults of DMX addresses 001-064, sweep mode, and normal operation.
MINUTE (blue)	Access Configuration Screen	2. Press the **INPUT** ↑, **INPUT** ↓, **OUTPUT** ↑, **OUTPUT** ↓, **TIMER** ↑, **TIMER** ↓ keys as necessary to set the desired DMX start and end addresses.	1. Press **HOUR** (blue) and **MINUTE** (blue) simultaneously.
INPUT ↑	Increments start address by 1	3. If necessary, toggle the **SWITCH TYPE** key to set either sweep or instantaneous relay output response mode.	2. Press **TIMER** ↑ one time. 021 appears on the screen
INPUT ↓	Decrements start address by 1	4. If necessary toggle the **CONTROL TYPE** key to set Input 1 closed or opened (DMX is disabled or normal operation).	3. Press **OUTPUT** ↓ until 039 appears on the screen.
TIMER ↑	Increments the start address by 20	5. Press the QUIT key to return to the Home screen.	4. Press **SWITCH TYPE**. INSTANT appears on the screen.
TIMER ↓	Decrements the start address by 20	NOTE: Screen will time out after 10 seconds if no keys are pressed.	5. Verify that NO appears in the IN1 DISABLE field on the screen.
OUTPUT ↑	Increases address range by 1		5. Press **QUIT** or let the controller time out to save the entries.
OUTPUT ↓	Decreases address range by 1		
SWITCH TYPE	Toggles relay output response between sweep and Instantaneous		
CONTROL TYPE	Toggles between Input 1 closed DMX Disable and normal operation (Input 1 closure doesn't disable DMX operations)		
QUIT	Returns system to Home screen.		

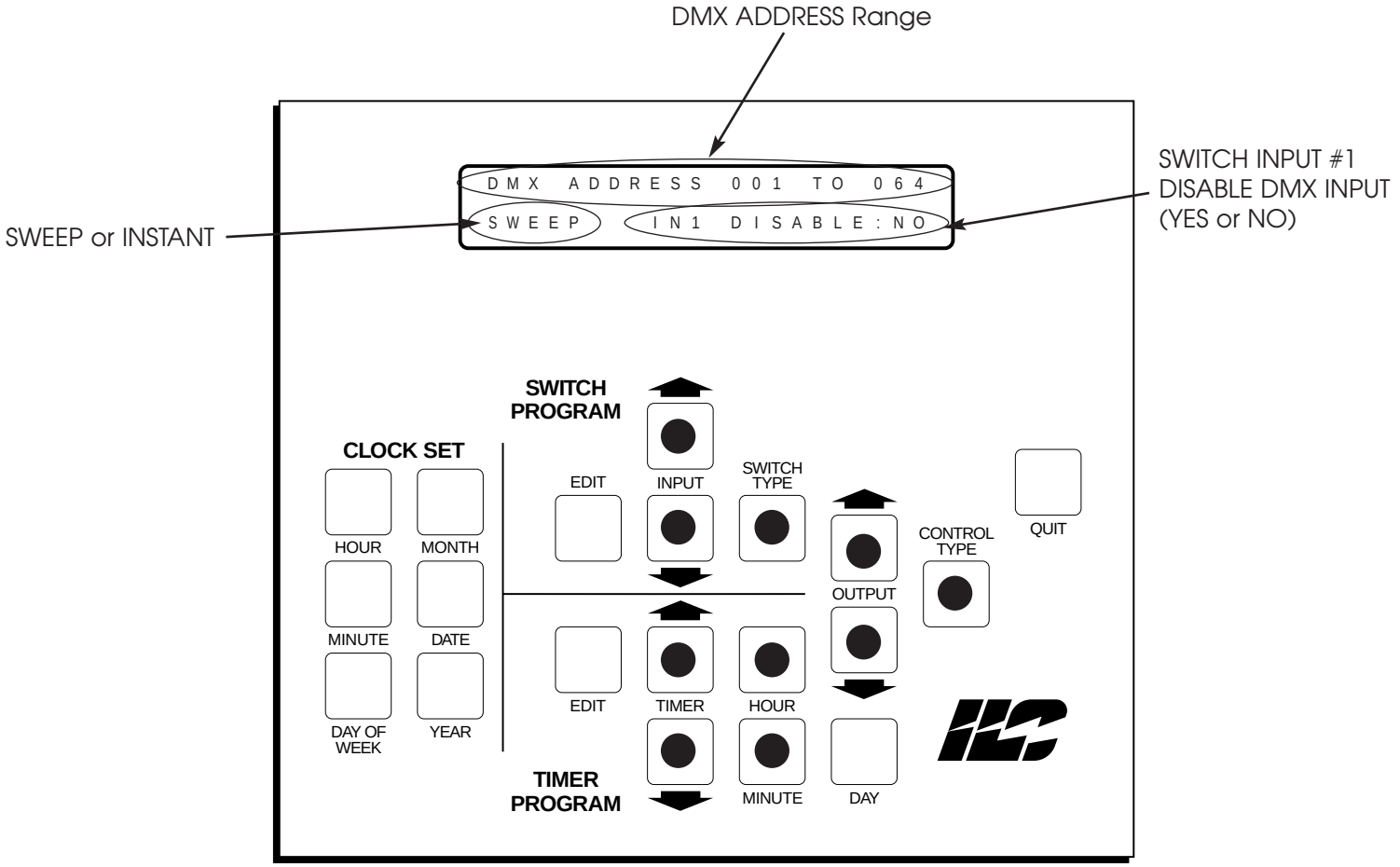


Figure 8-2 DMX Address Configuration

Table 8-2 Setting The DMX Signal Levels

Keys/Functions		Procedure	Comments/Examples
TIMER ↑	Accesses the Signal Level Edit screen	1. Press the blue **TIMER** ↑ and **TIMER** ↓ keys simultaneously to access the DMX Signal Level screen. 2. Press the **INPUT** ↑, **INPUT** ↓, as necessary to set the desired DMX OFF signal level. 3. Press the **TIMER** ↑, **TIMER** ↓, as necessary to set the desired DMX ON signal level. 4. Press the **OUTPUT** ↑, **OUTPUT** ↓, as necessary to set the desired DMX LOCK OFF signal level. 5. Press the **HOUR, MINUTE,** as necessary to set the desired DMX LOCK ON signal level. 6. Press the **QUIT** key to return to the Home screen. NOTE: Screen will time out after 5 seconds if no keys are pressed.	Example: Set the OFF DMX signal level to 42% , the ON level to 63%, the LOCK OFF level to 3% and the LOCK ON level of 95%. Assume that you start with the OFF at 40%, ON at 60%, LOCK ON 100% and LOCK OFF at 0%. 1. Press **TIMER** ↑ and **TIMER** ↓ simultaneously. 2. Press **INPUT** ↑ twice to set the OFF level at 42% 3. Press **TIMER** ↑ three times to set the ON level at 63%. 4. Press **MINUTE** 5 times to set LOCK ON at 95%. 5. Press **OUTPUT** ↑ 3 times to set LOCK OFF at 3%. 6. Press **QUIT** or let the controller time out to save the entries.
INPUT ↑	Increases OFF level by 1%		
INPUT ↓	Decreases OFF level by 1%		
TIMER ↑	Increases ON level by 1%		
TIMER ↓	Decreases ON level by 1%		
HOUR (Blue)	Increases LOCK ON level by 1%		
MINUTE (Blue)	Decreases LOCK ON Level by 1%.		
OUTPUT ↑	Increases LOCK OFF level by 1%		
OUTPUT ↓	Decreases LOCK OFF by 1%.		
QUIT	Returns system to Home screen.		

Quick Reference:
ON - Level at which relay outputs controlled by DMX address turn ON.
OFF - Level at which relay outputs controlled by DMX address turn OFF.
LOCK ON - Level at which relay outputs controlled by DMX address remain ON and ignore all other DMX signals.
LOCK OFF - Level at which relay outputs controlled by DMX address remain OFF and ignore all other DMX signals.

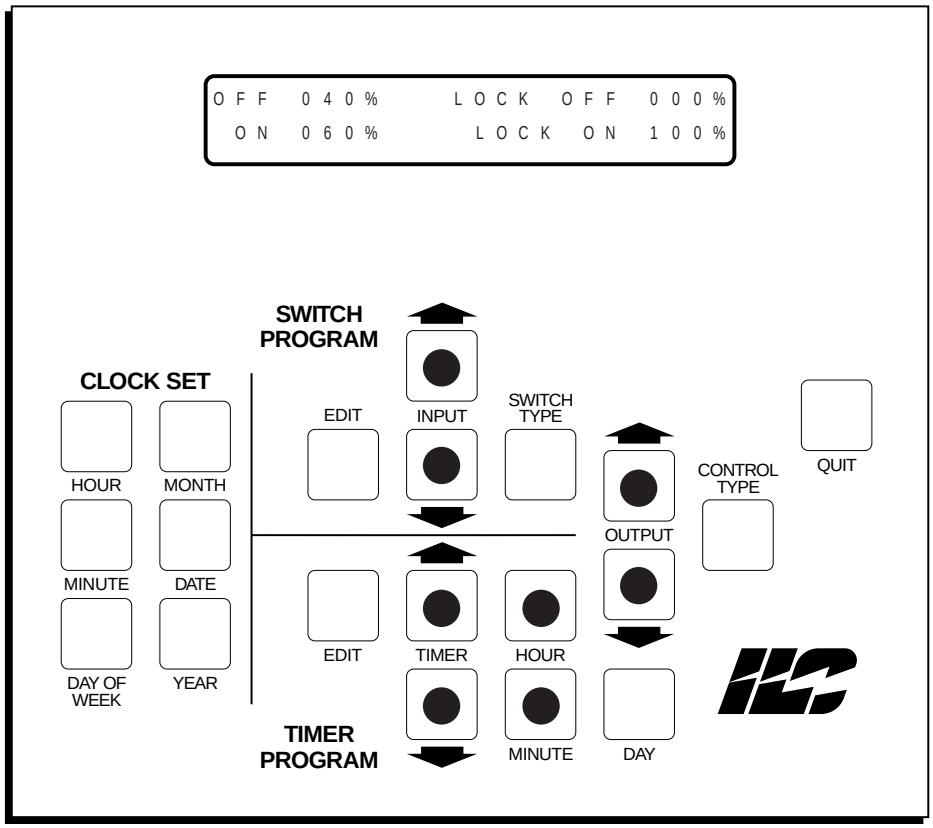


Figure 8-3 Setting DMX Signal Levels

Table 8-3 DMX Switch Input Programming

Keys/Functions		Procedure	Comments/Examples
EDIT (yellow)	Accesses the DMX input screen when pressed twice	1. Press the **EDIT** (yellow) twice to access the DMX input screen. 2. Press the **INPUT** ↑, **INPUT** ↓, as necessary until the input to be programmed appears in the DMX INPUT# field. 3. Press the **OUTPUT** ↑, **OUTPUT** ↓, as necessary until the output to be controlled by the selected DMX input appears in the OUT# field. 4. Press the **CONTROL TYPE** key to select the desired control. 5. Repeat steps 3 and 4 until you have entered all outputs to be controlled by the selected DMX input 6. Repeat steps 2-5 to program the other DMX inputs. 7. Press the **QUIT** key to save and return to the Home screen. NOTE: Screen will time out after 20 seconds if no keys are pressed.	Example: Program DMX input 2 to switch relay outputs 3,6, ON/OFF 1. Press **EDIT** (yellow) twice. 2. Press **INPUT** ↓ one time to select DMX Input 002. 3. Press **OUTPUT** ↓ until 003 appears in the OUT# field. 4. Press **CONTROL TYPE** until ON/OFF control appears. 5. Press **OUTPUT** ↓ until 006 appears in the OUT# field. 6. Press **CONTROL TYPE** until ON/OFF control appears. 7. Press **QUIT** or let the controller time out to save the entries.
INPUT ↑	Decrements input number		
INPUT ↓	Increments input number		
OUTPUT ↑	Decrements output number		
OUTPUT ↓	Increments output number		
QUIT	Returns system to Home screen.		

Quick Reference:
Up to 64 inputs can be defined as DMX addresses. Inputs must be consecutive. Starting address may be from 1 to 512. Up to 96 relay outputs may be programmed to respond to the DMX inputs. Each input can be programmed to control from 0 to all 96 of the outputs.

Control Types:
ON Only
OFF Only
ON/OFF

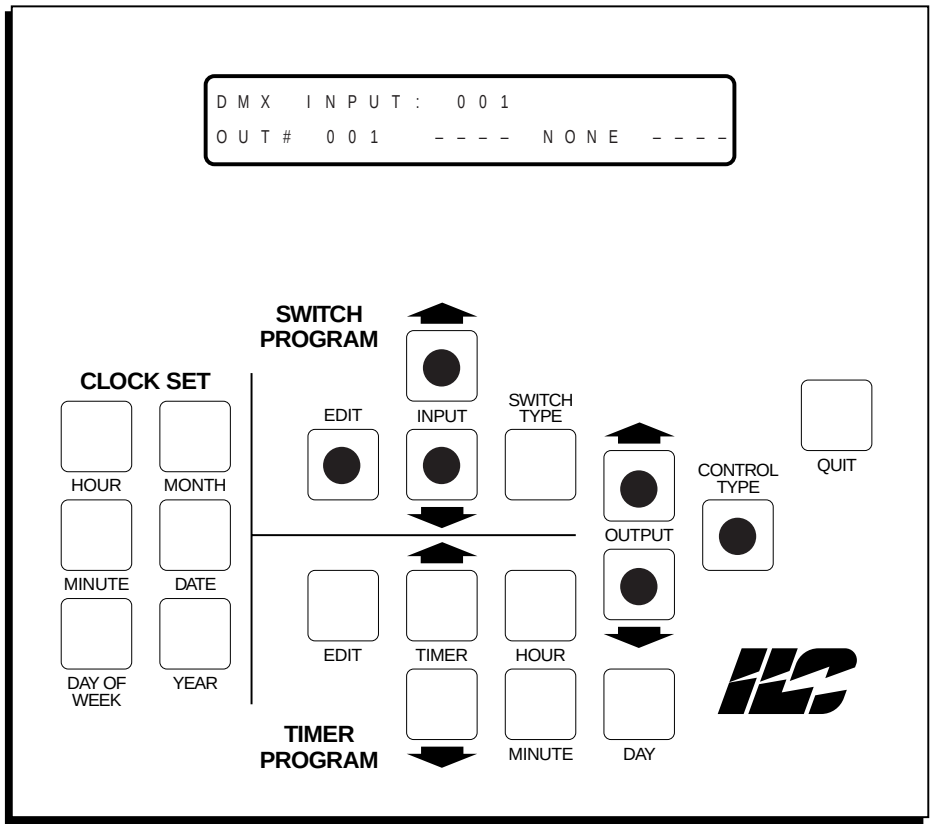


Figure 8-4 Programming DMX Switch Inputs

Notes