



QWL 3.X Rev 1 Series

Integrated Building Manager Panel

Models to Support Wired and
Wireless Networks



Description

The QWL 3.X Integrated Building Manager Panel contains a Ubiquity™ Site Gateway with integrated lighting and energy management controls.

Features

Ubiquity Site Gateway

- Site gateway to Ubiquity: enables controller interoperability with Ubiquity
- Enables Ubiquity to maintain controller programming and scheduling
- Compatible with all TCS Basys supported controllers
- Controller protocols supported: TCSbus, Modbus
- Supervisory control routines
- Supervisory override strategy
- Auto discovery of networked controllers
- One integrated RS-485 serial port
- Additional serial ports can be added via USB ports
- Integrated Ethernet controller with firewall
- Integrated configuration web page
- User adjustable controller monitoring rate
- Remotely upgradable gateway software

Lighting Controller (SLQ218)

- 365-day programming for each circuit
- Analog input for photo sensor with the ability to remotely adjust sensitivity level
- Selectable power failure state
- Eight channel lighting schedules for interior and exterior applications
- Digital photocell inputs
- Astronomical clock
- External time clock or occupancy sensor input for each channel
- Channel status LEDs
- Selectable normally open or normally closed relays
- Built-in 2 Amp relays with hand/off/auto switches

Energy Meter (SEQ100)

Utility Meter for Monitoring of:

- Electric single and 3 phase kW and kWh
- Gas
- Water
- BTU

Contents

Description	1
Features	1
Factory IP Network Address Configuration	1
Mounting.	2
Wiring	2
RS-485 Controller Network Wiring & Setup	3
Gateway Configuration Page	4
Commissioning Tools	5
Programming - Lighting Module	6
Programming - Pulse Meter	9
TCS ZigBee Wireless Network.	10
LED Display and Push Buttons	10
Checkout & Troubleshooting	10

Factory IP Network Address Configuration

Typically the QWL 3.X Series Panel are ordered pre-programmed to customer specific networks and no additional software configuration is required. This is the preferred purchasing method.

If a QWL 3.X Series Panel was purchased without pre-programming it will be shipped with DHCP client enabled. The configuration page is available through a browser for additional configuration of the QWL 3.X Series Panel local IP address. Contact your network administrator to determine the local IP address (refer to the MAC address available on the product label).

Mounting

The QWL 3.X series panel is designed for mounting using four #10-12 pan head screws.

When drilling ensure that the QWL 3.X series panel is powered down and all metal shavings are captured.

Wiring

The QWL 3.X series panel terminal designations are shown below.

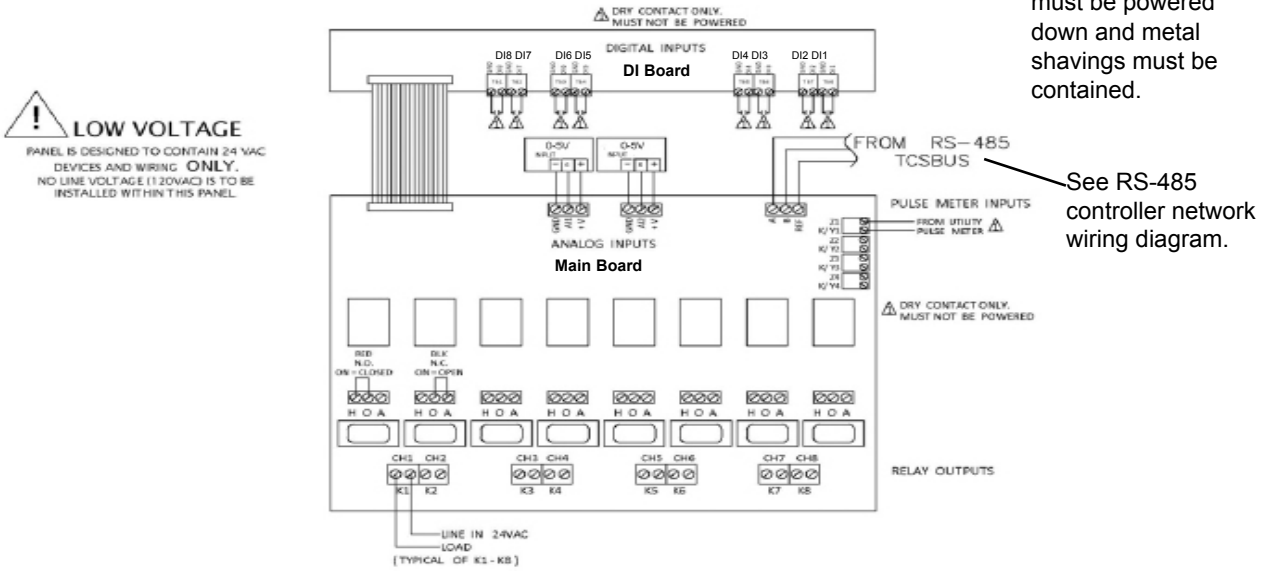
INPUT WIRING

The QWL 3.X series panel accepts two 0 to 5 VDC inputs, eight dry contact/digital inputs and 4 pulse meter inputs.

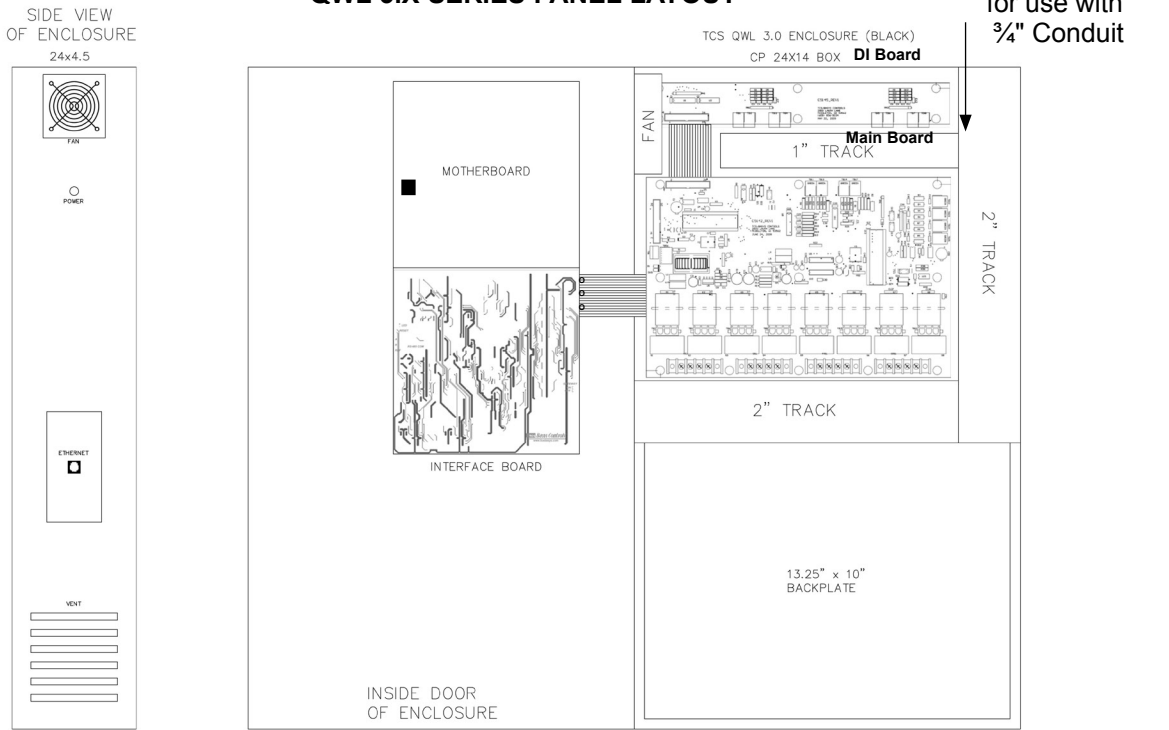
POWERING THE QWL 3.X SERIES PANEL

The QWL 3.X series panel is powered from a 120VAC @ 60HZ to 12VDC power supply module. The QWL 3.X series panel is designed to contain 24 VAC devices and wiring ONLY. No line voltage (120 VAC or greater) is to be installed within this panel.

QWL 3.X SERIES PANEL WIRING



QWL 3.X SERIES PANEL LAYOUT



RS-485 Controller Network

Wiring & Setup

All controls connected to the network will need to be programmed with the same communication baud rate as well as a unique communication address from 0 to 255, excluding 248. On controllers with displays, this can either be done from the face of the controller using the keypad and display, or using TCS Insight software, or by calling TCS Technical Support. TCS Technical Support can access the QWL 3.X Series Panel online and change the address of a controller.

Use 22 AWG, twisted shielded 3-conductor cable for network wiring. Network wiring should start at one controller and go to the next and then go to the next, and so on until the final controller is reached. Wiring is such that all "A" wires are connected to "A" wires, all "B" wires are connected to "B" wires, and all "REF" wires are connected to "REF" wires.

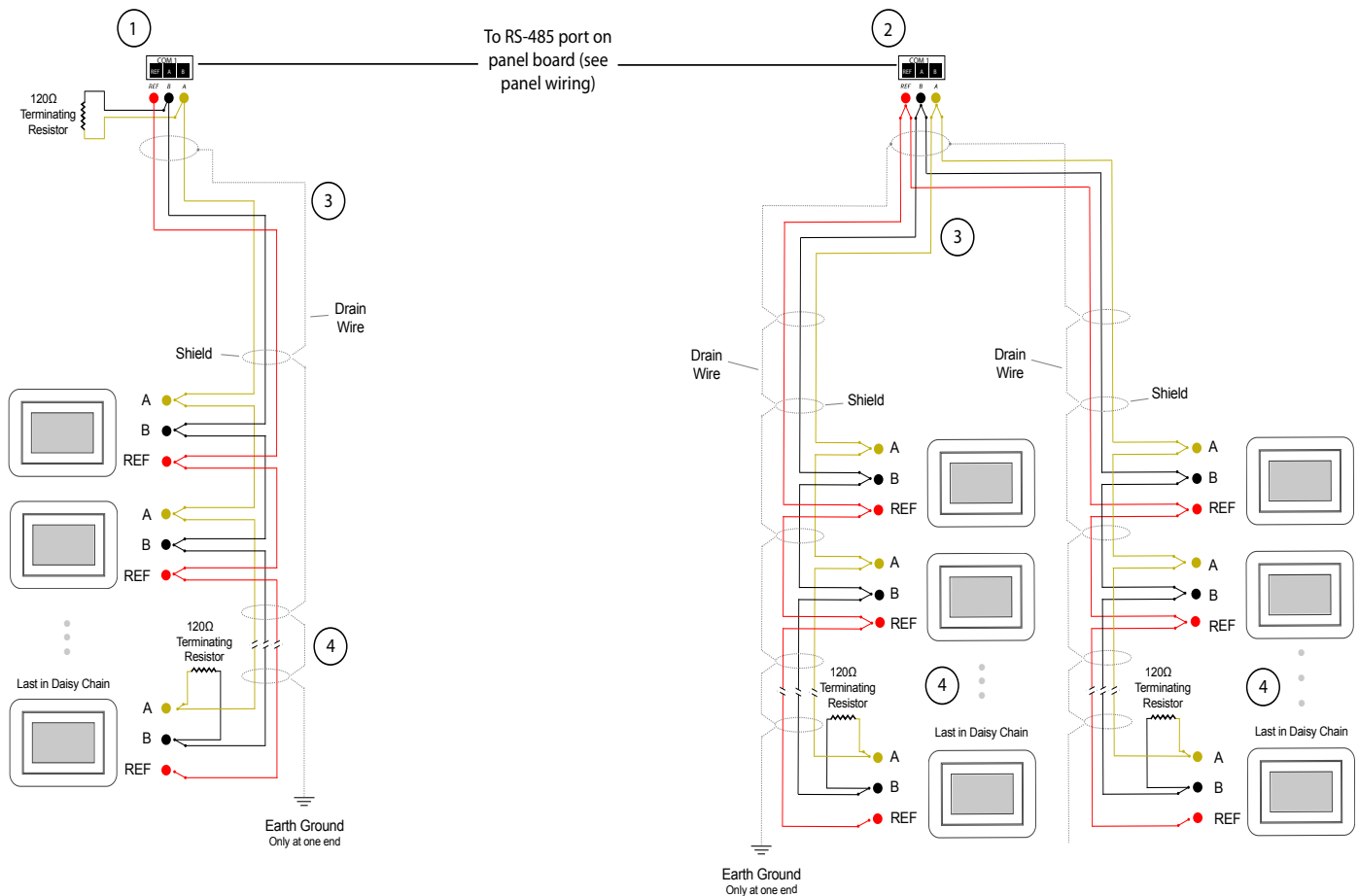
A 120 Ω terminating resistor should be placed at each of the two ends of the network directly across the "A" and

"B" wires. If the QWL 3.X Series Panel will be at one end of the network, hard wired a 120 Ω terminating resistor across the "A" and "B" terminals at the QWL 3.X Series Panel (See 1 below).

If the QWL 3.X Series Panel will be in the middle of the network, do not wire in the terminating resistor on the QWL 3.X Series Panel terminal block (See 2 below). Finally, connect one end (ideally the furthest end from the QWL 3.X Series Panel) of the shield wire of the network wiring to earth ground. TCS recommends a 250 millisecond time out period for all wired networks, and 1000 milliseconds for wireless networks. If you encounter timeout errors please contact tech support.

NOTE: In the middle of the network, all network wiring shields should be twisted together and taped off to prevent accidental grounding. More than one ground on the network wiring can result in communication failure.

NOTE: A maximum of 2 terminating resistors can be used. See Figure below.



- 1 The QWL 3.X Series Panel at end of the network.
- 2 The QWL 3.X Series Panel in the middle of the network.
- 3 Shielded, twisted 3-conductor communications wiring with one end earth grounded. (120 Ω balancing resistors provided.)
- 4 Can use up to the total of 64 controllers. For more controllers, will need to add another The QWL 3.X Series Panel.

NOTES:

1. If using more than 64 controllers, use additional QD1010 adapters.
2. Each controller must use the same baud rate and be assigned a unique address.

Gateway Configuration Page

Once you have made connection and have logged in you are able to configure the operation of the unit by selecting the proper parameters for your application. All Ubiquity™ Application software and functionality is accessed by logging into the Central Server (www.ubiquitysystems.net) **not** by using this configuration page.

INSTALLATION INFORMATION

This section contains installer and site related information. The information entered here is sent to the central server when a site initially comes online to help identify the site to link it to the correct Ubiquity site. For the most part, this information is for reference purposes only, except for the Site Time. The Site Time is used by the local network and the QWL 3.X Series Panel until the Ubiquity central server performs a time synchronization with the site.

NOTE: Be sure to set the correct Time zone so that the site will correctly adjust the time during future time synchronizations with the central server.

Once you are finished entering information in this section, click the Update Installation Info button.

Installation Information

Contractor Contact

Installer Name: Installer Contact Phone Number:

Identity

Model:	QD2040	Application Version:	07.05.00
Submodel:	QD2040a	Java Version:	IcedTea6-1.13.4
Hardware Version:	AAA	OS:	qdos5
MAC:	001F7BB00919	OS Version:	7.6
Serial Number:	049600001000001	Site Name:	<input type="text" value="TCS Basys Controls"/>

Location

Address Line 1: Address Line 2:

Country: State:

City: Zip:

Site Time

Wait up to two minutes for the values to change.

Current Time: : AM PM

Timezone:

APPLICATION INFORMATION

This section contains settings which define how the QWL 3.X Series Panel interacts with the controller network, and how it communicates the data to the actual server.

Application Options: You must select a Network Polling Cycle Time for the QWL 3.X Series Panel. This is the time interval that the unit will poll the entire network of controllers on all ports. The default setting is 1 minute. You must select whether or not to allow caching the host name via DNS. Typically, this is left unchecked. You must select how often the QWL 3.X Series Panel connects to the central server. Typically this is set to "Always On."

Application Information

Application Options

Controller Network Polling Cycle:

Caching Settings: Enable Cache

Connection Times: Always On Never On Specify Times

RS485 Network -- Port Configuration

Autodetection of Controllers on All Ports: Enabled

All Ports are Automatically Detected Once Hardware is Installed

Device U-PORT1-0:

Protocol Support: Baud Rate:

Time-Out Period: milliseconds Autodetection Range: to

RS-485 Network - Port Configuration: Here you will configure each of the COM ports for this site. Typically, you will leave Auto Detection of Controls on All Ports enabled so the QWL 3.X Series Panel will find and add the controller as they are included on one of the networks (wired or wireless). If disabled, new controllers must be added manually in Ubiquity.

The communication ports are automatically detected once the QWL 3.X Series Panel is powered up. Once detected each COM port needs to be configured to ensure proper functioning of the network on each port. Each port can be enabled or disabled from the drop down menu.

You must also select the proper protocol being used on each port. The current protocol selections from the drop down menu are TCSbus or Modbus. You must also select the communication baud rate for each port. This setting must be the same as all of the controllers on that port. You can also adjust the Time-Out Period for each port. TCS recommends 250ms for wired networks and 1000ms for all wireless networks.

COMMUNICATION INFORMATION

This section contains settings which control how the QWL 3.X Series Panel connects out through the LAN or WAN to the Internet. All of these settings are determined by your local network administrator or IT department. The correct settings, network permissions, and port openings (ports 80 and/or 443) need to be verified with them prior to installation and connecting to the local network.

Communications Options: The QWL 3.X Series Panel supports both static IP and Dynamic Host Configuration Protocol (DHCP) IP address allocations. Enter the Central Server Location, typically www.ubiquitysystems.net by clicking the "Set Ubiquity Domain Name" button. There are a few special options which can be enabled: TCP window scaling, IPV6 and Secure Sockets Layer (SSL requires port 443 to be open), select whether to enable or disable these special options. Enter host name if needed (typically left blank).

Communication Information

Communication Options

IP Address Allocation: DHCP Static IP

Central Server Location: [Set Ubiquity Domain Name](#)

Special Options: Disable TCP Window Scaling Disable IPV6 Enable SSL

HostName:

Proxy

Enable Proxy Server Usage:

Enable NTLM Authentication: Enable

Select NTLM Mode: LM NT NT+LM

Proxy Server: Proxy Port:

Proxy Username: Proxy Password:

[Update Communication Info](#)

Network: Select the desired IP allocation (DHCP or static IP addressing) to be used. When using static IP, it is necessary to enter the IP Address, Gateway, Subnet, DNS1 and DNS2 settings Virtual IP can be used (typically left blank). The IP settings will need to be established by the LAN/WAN network administrator prior to installation. When utilizing DHCP addressing, the IP address settings are automatically assigned when communication is established.

Proxy: If a proxy is required, select Static Proxy from the drop-down and enter all the related details in the fields that appear. Once you are finished entering information in this section, click the Update Commissioning Info button.

SECURITY INFORMATION

This section contains settings which control the security of the gateway within the QWL 3.X Series Panel and whether or not it can be accessed through the web interface. Enabling Secure Mode disables all web interfaces including the configuration page, and requires a specially configured USB flash drive or TCS Technical Support access to the QWL Panel if it is online with Ubiquity central server to "unlock" it.

Here is where you change the default login credentials used to access the Configuration Page. It is recommend to change these login credentials.

Once you are finished entering information in this section, click the Update Security Info button.

Security Information

Application Security

Secure Mode Enable

User: admin Strong Password Example Qv33n#ttt

Password: Retype Password

[Update Security Info](#) [Commissioning Tools](#)

Commissioning Tools

A separate page which contains various commissioning tools can be accessed by clicking the "Commissioning Tools" button at the bottom of the Setup page. This page gives you access to additional information about the connection status of the QWL 3.X Series Panel and the controller network connected to it.

UBIQUITY CONNECTION STATUS

This section displays the status of the connection between the QWL 3.X Series Panel and the central server. You have 3 options for the message that will appear here:

- 1) Error - No Route to Host -- means the unit does not currently have an Ethernet connection.
- 2) Connected -- means the unit is able to communicate to the Ubiquity central server BUT is not being matched up with a specific Site, typically this indicates that the site is not initialized on the central server side yet, please contact TCS Basys Controls to assign or initialize the QWL 3.X Series Panel to a site.
- 3) Established -- means the unit is communicating with the Ubiquity central server AND is ready to go. All Ubiquity functions (monitoring, programming, alarming, etc.) should be available through the user interface at this point.

Clicking the green button with the arrow on it on the right side of the Ubiquity Connection Status title bar will refresh the connection status.

Commissioning Tools

Ubiquity Connection Status C

Status: **ESTABLISHED** Date: Thu, 28 Jan 2016 23:06:38 -0500

Controller View C

Port	State	Address	Controller Model	Communication Status
1	Confirmed	0	AUTO_DETECTED_0	OK
1	Confirmed	3	2166	OK
1	Confirmed	4	2108	OK
1	Confirmed	6	1022	OK
1	Confirmed	7	1024	OK
1	Confirmed	9	133	OK
1	Confirmed	10	118	OK
1	Confirmed	11	1001A	OK
1	Confirmed	12	1025	OK
1	Confirmed	13	1143B	OK
1	Confirmed	41	1022	COMMLOSS
1	Confirmed	42	1024	COMMLOSS
1	Confirmed	108	2108	COMMLOSS

Remove Selected

System Commands

CONTROLLER VIEW

This section allows you to see what controllers have been found by the QWL Panel and view each controller's address, model, and communication status. The state field will show AUTO-DETECTED initially when found by the unit and CONFIRMED once the controller has been recognized by the Ubiquity central server. This information allows the installer to verify that each controller has been found by the QWL Panel and is communicating with the local network.

Clicking the green button with the arrow on it on the right side of the Controller View title bar will refresh each controller's status.

SYSTEM COMMANDS

In this section you are able to set a couple of system flags for the QWL 3.X Series Panel itself. "Reboot Unit" sets a flag which will shut off and restart the QWL 3.X Series Panel within a 5 minute Cycle. "Check for Update" contacts the Ubiquity Central Server for any updates relevant to its particular model number and software version. Once the update has been downloaded, it is automatically applied, and the unit may reboot.

NOTE: The "Check for Update" command requires that the QWL 3.X Series Panel has Internet access to retrieve the update patch.

Programming - Lighting Module

The lighting module portion of this panel is an SLQ218. It must be programmed using TCS Insight or Ubiquity.

CHANNEL EVENT SCHEDULING

There are eight independent channels each with its own schedule. If the occupied or "ON" time for a particular day is from 8:00AM to 5:00PM. In the schedule enter 8:00 to 17:00. Within the Ubiquity programming page, the desired schedule is simply selected from the drop-down menu for each channel. If the desired schedule is not shown in the drop-down, new schedules can be created or existing schedules can be edited on the Scheduling page.

Schedule

Rename Channel 1
Using Schedule: [NONE] Enable Blink Output Enable Astronomical Time When Channel is ON, Relay is Closed

Rename Channel 2
Using Schedule: [Main Schedule]
Weekdays: 09:00 am - 05:00 pm
Saturday: 09:00 am - 05:00 pm
Sunday: 09:00 am - 05:00 pm
 Enable Blink Output Enable Astronomical Time When Channel is ON, Relay is Closed

Rename Channel 3
Using Schedule: [Main Schedule]
Weekdays: 09:00 am - 05:00 pm
Saturday: 09:00 am - 05:00 pm
Sunday: 09:00 am - 05:00 pm

CHANNEL HOLIDAY SETUP

Holidays are created as part of the Scheduling page and will appear as part of the selected schedule. You can create date specific holidays, roaming holidays, or select from a list of standard bank holidays. If the selected schedule does not include the desired holiday(s), the schedule can be edited on the Scheduling page.

ENABLE BLINK OUTPUT

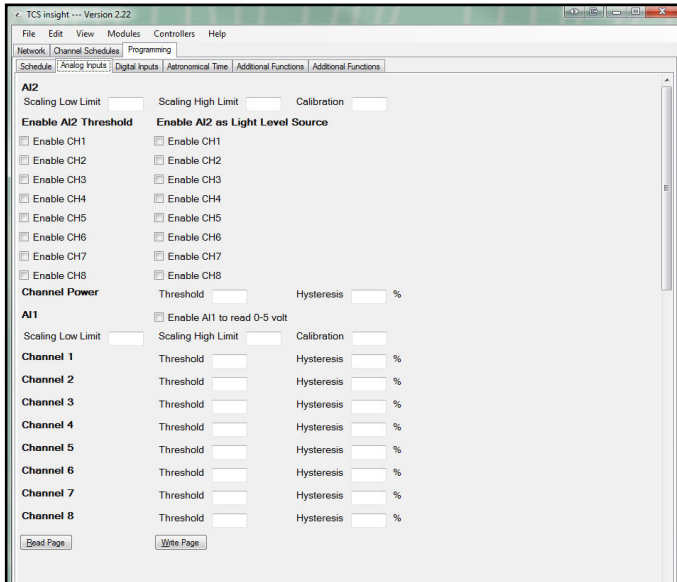
The Blink Output option forces the respective lighting output turn off four times, five minutes prior to an unoccupied or off period. This will give an indication that a scheduled on time is about to end. Click the checkbox to enable this function for each channel.

ENABLE ASTRONOMICAL TIME

The Astronomical Time option allows the controller to turn a channel off based on the locations sunrise and sunset times. See the Astronomical Time section later in the manual for more details and additional configuration options. Click the checkbox to enable this function for each channel.

WHEN CHANNEL IS "ON"

You can select how you want the time clock output (Digital Output Mode) to behave when the channel is occupied or "ON". You can choose for the Relay to be Normally Open or Normally Closed during on periods. Simply select the desired behavior from the drop-down menu.



AI1 AMBIENT LIGHT INPUT

If using an ambient light sensor (0 to 5 or 1 to 5V); set the low and high scaling limits for AI2. These limits are what the light sensor reads at low limit and what the light sensor reads at full scale.

A Lighting Channel Threshold and Hysteresis for each of the available channels can be set for this input signal. The Channel Power Threshold is basically a setpoint for which AI1 is compared to determine when to turn off the selected cycle(s). The Channel Power Hysteresis is a buffer value which prevents the channel from cycling off/on prematurely. For example, if the input is scaled 0 to 1000 lumens and you want to turn off one channel if the input gets up to 500 lumens and allow it to come back on if the input falls to 400 lumens, enter in 0 for the scaling low limit, 1000 for the scaling high limit, 500 for the threshold and 10% for the hysteresis for that channel.

Select a threshold and hysteresis for the channels which will be allowed to be shut off based on this input hitting the threshold. A common application for this feature is to control parking and exterior signage lighting. Essentially the channel will be on all the time it is occupied except when there is too much light. (Similar to the astronomical time function). **If AI1 is not used, the threshold for all channels MUST equal the scaling high limit.**

AI2 ENERGY / POWER / MONITORING INPUT

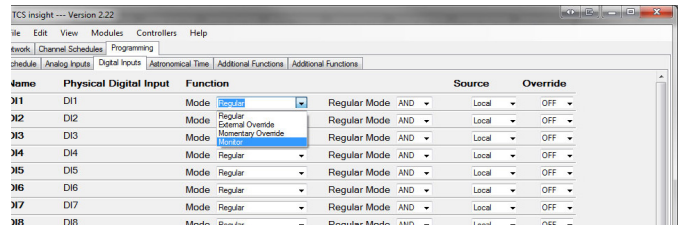
If using an energy meter, power meter or current transducer (0-5V), set the low and high scaling limits for AI2. These limits are what the energy or power meter reads at 0V and what the energy or power meter reads at 5V. For a 4 to 20mA input to be wired to AI2, a 250 Ω resistor must be installed between AI2 and GND. If you want to use this input with a threshold and hysteresis (Channel Power section) to shut off lighting channels, select the relevant lighting channels (Enable AI2 Threshold checkboxes) and enter a threshold and a hysteresis to be used. **If AI1 is not used, the channel power threshold MUST equal the scaling high limit.**

Select whether you want the time clock output (Digital Output Mode) to be Normally Open or Normally Closed during on periods.

The Channel Power Threshold is basically a setpoint to which AI2 is compared to determine when to turn off the selected channel(s). The Channel Power Hysteresis is a buffer value which prevents the channel from cycling off/on prematurely. For example, if the AI2 input is scaled 0 to 10000 KW and you want to turn off some channels if the input gets to 7500 KW and allow them to come back on if the input falls to 6500 KW, enter in 0 for the scaling low limit, 10000 for the scaling high limit, 7500 for the threshold and 10% for the hysteresis. You should choose this threshold to be larger than the accuracy/error specification of the equipment/device being turned off so it does not cycle on and off.

AI2 AMBIENT LIGHT INPUT

If AI2 is not used for power limiting, a second light sensor can be used to monitor another area. Set the low and high limits for AI2. These limits are the light sensor reading at 0V and the sensor reading at 5V respectively. Click on the Enable box for each of the channels to be controlled by AI2 (in the Enable AI2 as Light Level Source column). Then proceed to enter threshold and hysteresis values for each channel (located just below the AI1 AMBIENT LIGHT INPUT section). Each channel that is selected/checked (Enable AI2 as Light Level Source) will then have its threshold/hysteresis compared to AI2 instead of AI1



CHANNEL MONITORING AND CONTROL

DI1 and Override 1 are used for Channel 1, DI2 and Override 2 are used for Channel 2, etc.

There are four Digital Input Modes which can be used with a digital input: Regular, External Override, Momentary Override, & Monitor.

Regular mode: The digital input is used in conjunction with the programmed schedule in determining when the relay output should be on or off.

External Override mode: The digital input acts the same as the override button on the front of the QWL 3.X Series panel. The switch used for this type of digital input must be a momentary N.O. switch.

Momentary Override: The digital input acts like a toggle switch. This must also be a momentary N.O. switch. If the time clock is on, pressing the switch turns it off, If the time clock is off, pressing the switch turns it on.

Monitor mode: the digital input acts as a monitor for the DI and has no other function.

ASTRONOMICAL TIME

The Astronomical time function may be setup on any of the channels. It controls and turns off the enabled light channel for the daylight period from sunrise to sunset. The following diagram illustrates the typical application of this capability.

Astronomical Time		Degrees	Minutes	Offset Range (-127 to 127)	Sunrise	Sunset
Global Location						
Latitude	0	0		Channel 1	0 minutes	0 minutes
Longitude	0	0		Channel 2	0 minutes	0 minutes
GMT Offset	0		minutes	Channel 3	0 minutes	0 minutes
Daylight Saving Control	Automatic			Channel 4	0 minutes	0 minutes
	<input type="checkbox"/> Add 1 Hour			Channel 5	0 minutes	0 minutes
				Channel 6	0 minutes	0 minutes
				Channel 7	0 minutes	0 minutes
				Channel 8	0 minutes	0 minutes

To setup astronomical time, enter the Latitude and Longitude parameters for the location being controlled. Also enter the time offset from GMT (Greenwich Mean Time). For example, the USA Central Standard time zone is offset -360 minutes from GMT. Madison, Wisconsin, USA is at 43° 5 minutes North (+) Latitude and 98° 30 minutes west (+) Longitude. The GMT Offset range is + 720 Minutes. Also click the box if applying daylight savings time to the astronomical time calculation.

Next, select the channel(s) that should have the astronomical time function and click the Enable box. This is done in the Schedule section of the page.

Note: For non-North American Daylight Saving time set the manual DLS (Day Light Saving) time.

CHANNEL OCCUPANT OVERRIDE

This is the number of minutes from 0 to 255 (4 hr, 15 min) which the controller will bring a system that is Off to On when its override button is pressed. This time can be different for each channel.

Occupied Override: Select whether to allow an occupied override and if so, whether it will be a schedule or channel override.

The screenshot shows the 'Channel Schedules' section of the TCS insight software. It displays three override settings, each with a 'Source' dropdown (set to 'Local'), an 'Override Time' input field, and an 'Enable Occupied Override' checkbox. The 'Override 1' setting has its 'OFF' button highlighted.

HOLIDAY VANISHING

Choose whether to enable the Holiday Vanishing Feature. If checked, the controller will make the number of days for a holiday 0 after the holiday is over. This will keep the holiday from occurring in subsequent years if it is not reprogrammed.

The screenshot shows the 'Astronomical Time' section of the TCS insight software. It includes settings for 'Holiday Vanishing', '15 Second Filter for DI Regular Mode', 'Maximum Power Down Period' (set to 0 minutes), 'Input Voltage 24VAC Calibration Factor' (set to 0), and 'Daylight Saving Time' (with 'Begin Month' and 'End Month' set to 1, and 'Week' set to 1). 'Read Page' and 'Write Page' buttons are visible at the bottom.

DIGITAL INPUT DELAY/FILTER

Enable the Digital Input Delay if you want the Digital Input to be present for 15 seconds before it takes effect. This can prevent cycling. Note, this delay if selected, will apply to all eight channels.

POWER DOWN PERIOD

If the controller loses power, it can remember which channels have been overridden and how much time is remaining in each override period. This is the amount of continuous power loss time in minutes where the controller will remember the override status'. If the controller loses power for longer than this period, the override buttons will have to be pressed again as necessary.

INPUT VOLTAGE

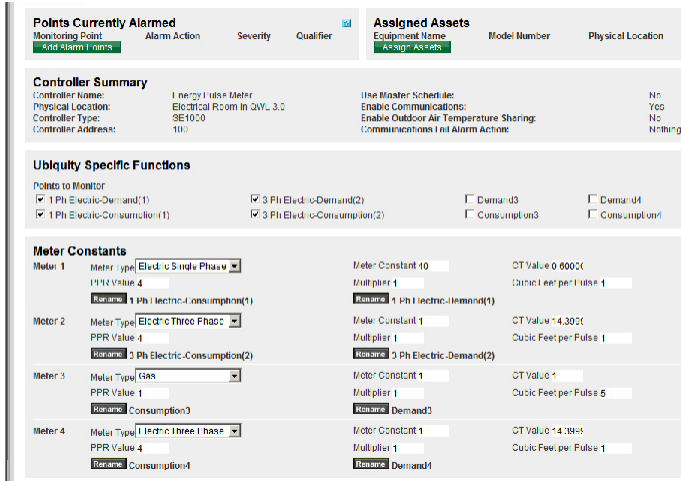
The input voltage is monitored. The calibration factor is used to scale the controller's 24 VAC power input to the appropriate line voltage. For example, if the line voltage is 120 VAC and the SLQ218 power input is 24 VAC, then the calibration factor is 5.0. If the line voltage is 120 VAC and the controller power input is 27 VAC, then the calibration factor is 4.4. If the line voltage is 277 VAC and the SLQ218 power input is 24 VAC, then the calibration factor is 11.5.

DAYLIGHT SAVING TIME

If Daylight saving is used, simply enable the "Daylight Saving Time" option within the software and enter the starting month + week and the ending month + week.

Programming - Pulse Meter

The utility pulse meter module portion of this panel is an SEQ100.



METER INPUTS

There are four meter inputs available. Each one is setup for a dry contact and cannot be changed. Each input (Meter 1, Meter 2, Meter 3 & Meter 4) can be configured to accept signals representing electrical, BTU, water or gas usage. The required parameters will be provided by either the utility company involved or on the current transducer (CT) used to generate the pulse signal.

METER TYPES

The SEQ100 supports various meter types. Selecting a meter type changes the default values as they are used to calculate meter consumption and demand for that particular meter. For each of the four SEQ100 meter inputs, there are five selectable options:

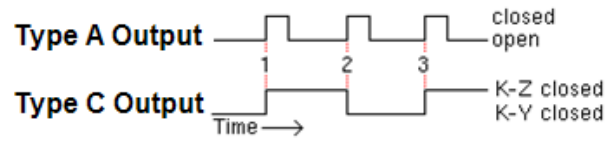
- ELEC 1 PH: Electric single phase meter.
- ELEC 3 PH: Electric three phase meter.
- GAS: Gas meter.
- WATER: Water meter
- BTU: BTU meter

Utility pulse meters can be one of two different types, depending on whether they count the leading and trailing edges of the pulse or only the leading edge of the pulse as a single count. A pulse output can be either a mechanical relay or solid state device. The pulse output corresponds to a unit/time of a monitored quantity. The amount of time between states of a pulse output corresponds to the meter demand and the number of pulses is proportional to the meter's consumption.

Below is a diagram depicting two types of utility meter pulse outputs. Meter Type A counts only the leading edge as a single pulse and the trailing edge is ignored. Meter Type C is known as a true KYZ meter and counts both the leading and trailing edges as a pulse, effectively doubling the number of pulses as seen by Meter Type A. The SEQ100 measures Type A output only; however,

KYZ functionality can be mimicked by using a "Meter Multiplier" value of 2.

In the following picture, both Type A and C are shown. Three pulses are shown, labelled 1, 2, and 3. Notice how the Type A output closes and opens for each pulse, where the Type C output simply changes state.



If you have a Type C device (3 terminals KYZ), you will need to double the multiplier. The SEQ100 only counts the contact closures for the K and Z terminals. Doubling the multiplier will correct this problem.

PROGRAMMING THE METER CONSTANTS:

CT Value: The value of the CT wired to the meter. This value is usually provided on the CT or on the utility output meter. This value is only used for and electric meter.

P/REV: The Pulses per revolution for the meter. This value is usually provided from the utility company.

CONSTANT: The value of the constant for the meter is usually provided from the utility company and many times is located on the electric or gas bill.

CU FT/P: The value for Cubic Feet per pulse. This only applies to Water, GAS and BTU, and is usually found on the utility meter itself.

MULT: The multiplier for the meter can be used to scale the meter output or correct for KYZ meter. The multiplier is used to convert the pulses to engineering unit data. For example, if your meter provides one pulse per 0.01KWH, then a constant of 0.01 is required.

MULTIPLIER:

Each model of power meter is different and has a different multiplier. For example, if the meter is a Type A and reports 1/10 kWh per pulse, set the input multiplier to 0.1. If the meter is a Type C and reports 1/10 kWh per pulse, set the input multiplier to 0.2.

You must obtain the correct pulse multiplier from the meter manufacturer prior to configuring the SEQ100.

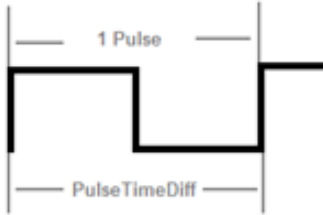
Some power meters have an option to configure the multiplier. Options often include 1, 0.1, 0.01, kWh per pulse. The best method to configure the pulse is to select the smallest multiplier available, considering the maximum load and pulse rate. To calculate the pulse rate, use the following formula:

$$\text{Pulses} = \frac{\text{KW} \times 3600 \times \text{multiplier}}{\text{Second}}$$

In general, the SEQ100 calculates electric meter consumption and demand as follows:

$$\text{Demand} = \frac{(\text{CTValue} * \text{MtrConst} * \text{MtrMult})}{(\text{PPRValue} * \text{PulseTimeDiff})}$$

$$\text{Consumption} = \frac{(\text{PulseCount} * \text{CTValue} * \text{MtrConst} * \text{MtrMult})}{\text{PPRValue}}$$



The above diagram depicts how a single pulse and the pulse time difference are represented on a pulse waveform input into the SEQ100.

TCS ZigBee Wireless Network

The QWL 3.2 includes a QW1010 TCS ZigBee wireless gateway to manage the TCS ZigBee wireless network. Be sure to plug the USB cable into one of the QWL 3.2 USB ports and configure it for the TCS protocol before initiating the wireless controllers. The QW1010 will also need to be properly setup before the wireless network will communicate (Please refer to the QW1010 Product Manual).

LED Display and Push Buttons

Fourteen LEDs on the QWL 3.X series panel allow the user to view the current operating status of the QWL 3.X series panel.

DIGITAL OUTPUTS: Along the Left hand side there are Eight LEDs and Push button

- The LEDs will be lit when the corresponding relay output is occupied, or physically on no matter if the channel is selected to be NO or NC.
- The push buttons correspond to each of the channels for the timed override function.
DATA: Along the Right hand side towards the bottom, there are three LEDs
- The RX LED indicated that the SEQ100 and SLQ218 are in Receive mode.
- The TX LED indicated that the SEQ100 and SLQ218 are in transmit mode.
- The Wireless LED- NOT USED
ALARM: This LED indicates that a local alarm is active
POWER: This LED indicated that the QWL 3.X series panel has power applied
- The reset button in the lower right hand corner is

used to “reboot” the entire QWL 3.X series panel. This is accomplished by pushing and holding the button for 5-7 seconds.

Note: During a reboot, the lights associated with the Lighting Module of this product could go out, it is recommended that you open the panel and place the Hand-Off-Auto switch for the corresponding channel in the Hand position to ensure that the lights that should be on remain on.

CPU: This LED indicates that the CPU or QD2040 portion of the panel is active and running.

Checkout & Troubleshooting

QWL 3 .X series panel

- Be sure to check and verify all wiring before powering up the QWL 3.X series panel
- The QWL 3.X series panel is designed to contain 24 VAC devices and wiring ONLY. No line voltage (120 VAC or greater) is to be installed within this panel.
- If you created metal shavings, ensure they are cleaned up and not in a position to allow for shorting before powering up.

Lighting Module - SLQ218

- Verify all wiring before powering up the QWL 3.X series panel and the SLQ218.
- Place the Hand-Off-Auto switches in the off position
- Place the appropriate (Normally Open) NO or (Normally Closed) NC jumpers (both included) in position-RED wires = NO-ON=Closed and BLACK wires=NC-On=Open

Utility Meter Pulse Transducer Module - SEQ100

- Verify all wiring prior to powering the QWL 3.X series panel and SEQ100.
- Take note of the current readings for all meters. Since the SEQ100 is used for only monitoring, and is the reading appear to be correct, you are done.
- If a value does not appears to be correct, verify on the programming page the value programmed in is correct.
- If a value is shown as 0 (Zero) the SEQ100 is not receiving a pulse signal.

Site Communications Center - QD2040

- Be sure to verify all wiring and programming information before hooking up to Network
- If the CPU LED does not light up, verify that the power supply nodule (included with the QWL 3.X series panel) is plugged in to an outlet that has power.

RS232/RS-485 Communications Converter - QD1010b

- Once a network is wired, you should test communications with all controllers on the network. Find out which controllers communicate and which ones don't. Go to the controllers that don't communicate and verify that the "A" and "B" wires are not switched. Verify the address and the baud rate as well. One of these three things is usually the problem. (see chart below)

IF	THEN
Tx LED blinks, Rx LED is always off. If this happens, the computer is sending, but the controller is not responding.	Check that the baud rate set on the controller(s) are all set the same. Verify controller address.
Both Tx and Rx LEDs will blink. Both the computer and the controller are responding, but you still receive communication errors.	Check wiring. Make sure that communication wiring runs are at least 5' away from fluorescent lights, motors, etc. Make sure that all controllers on a network have a unique address.
Rx LED is always on. This is typically a problem with wiring.	Make sure that the "A" and "B" wires are not switched or shorted. Make sure that there is no stray voltage on the "A" and "B" wires. "B" to "A" should measure between 0.5 VDC and 3.6 VDC. "B" to "A" should measure 0 VAC. "A" to "Shield" and "B" to "Shield" should measure 0 VAC and 0 VDC.
Communication errors/problems.	On smaller networks, try removing one of the two terminating resistors.