# CONTROLworks
*CONSULTING, LLC*

# Pentair Pool i-Link V9
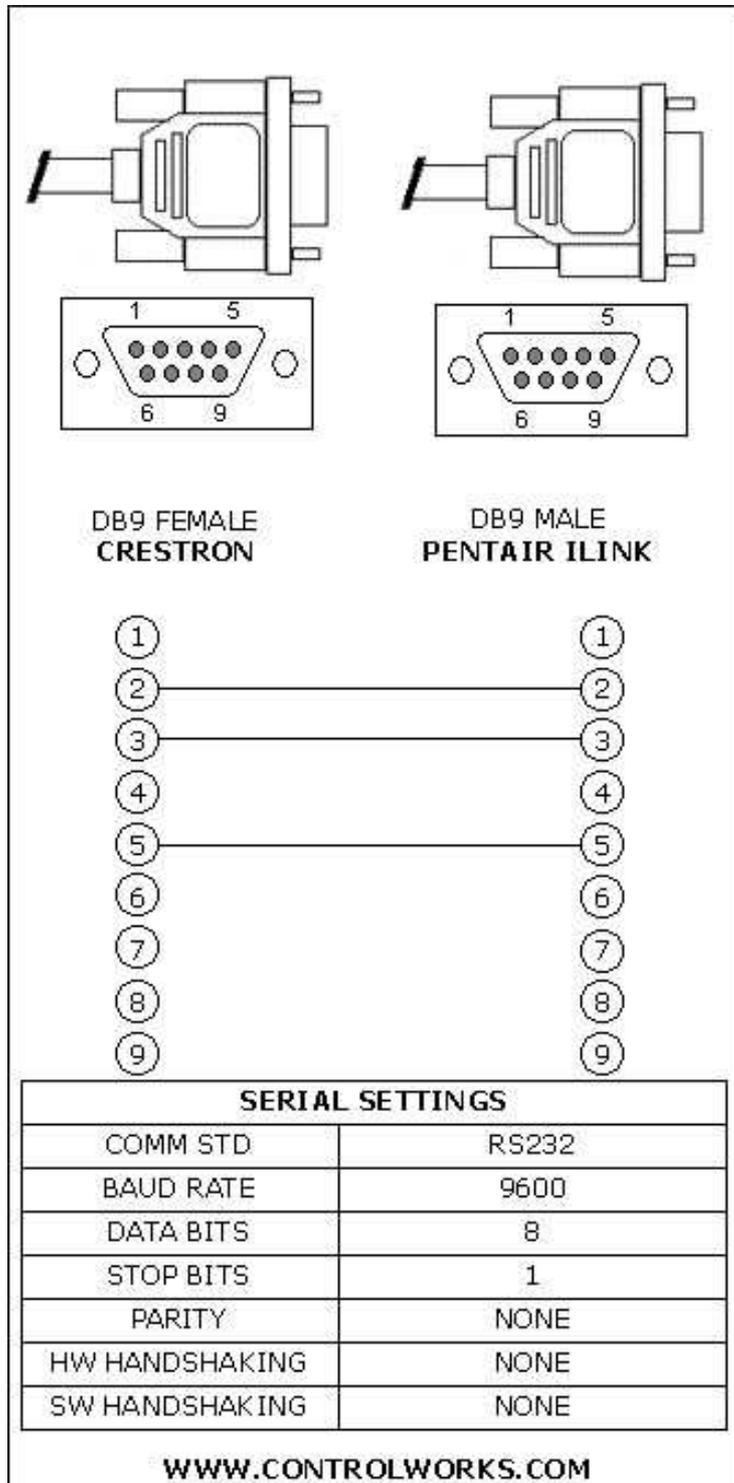# Module Application Guide

## Description

This module allows a Crestron processor to monitor and control a Pentair IntelliTouch pool controller via a Pentair i-Link Protocol Interface Adapter.  Control of most functions and real time feedback is provided from the i-Link adapter.  This is a separate part that hangs on the Pentair communication buss.  This adapter can be placed at the Crestron com port and requires no configuration.  The module supports control of most pool and spa functions with real time feedback regardless of whether changes are made to settings from the wall control or the module. Control of the waterfall, pumps, aux relays and aux dimmers is also provided.

## Lighting Protection

It is *highly recommended* that you place a Crestron CSP-RS232I in between your Crestron com port and the Pentair i-Link adapter.  As pool and spa systems are traditionally installed outdoors the likelihood of having lighting strike the Pentair system increases.  Installing a CSP-RS232I will electrically isolate the serial connection hopefully isolating the damage to just the Pentair system. In order for the CSP-RS232I to be effective it must be grounded properly.  Please see the installation manual for grounding instructions.

| Compatibility | | | Processor Requirements | |
|---|---|---|---|---|
| 3 COMPATIBLE | 2 SERIES COMPATIBLE | System Builder COMPATIBLE | Ethernet NOT NEEDED | Compact Flash NOT NEEDED |

# Serial Cable Pinout

DB9 FEMALE
**CRESTRON**

DB9 MALE
**PENTAIR ILINK**

| SERIAL SETTINGS | |
|---|---|
| COMM STD | RS232 |
| BAUD RATE | 9600 |
| DATA BITS | 8 |
| STOP BITS | 1 |
| PARITY | NONE |
| HW HANDSHAKING | NONE |
| SW HANDSHAKING | NONE |

WWW.CONTROLWORKS.COM

# Module Application

The i-Link adapter requires no setup other than connecting it to the Pentair four wire buss according to the i-link manual.  The adapter can be connected directly to your Crestron com port or connected via a serial cable made up per the above diagram that is no longer than 25' in length.

The controller must be set to report temperature is degrees Fahrenheit.

The lighting commands for the Sam, Sal, PG200, Intellibrite and, MagicStream do not provide feedback to the IntelliTouch controller, therefore there is no feedback associated with the lighting commands.

From the i-Link Manual: *"If there is an IntelliTouch MobileTouch wireless control panel installed, the MobileTouch transceiver screw terminal connector needs to be removed from the Transceiver circuit board before the IntelliTouch i-Link adapter initialization sequence.  Refer to Start-up with MobileTouch Control Panel, see page 15 for details."*

## Pentair Firmware Notes

Your installation's iLink adapter, Indoor and Outdoor controls should have these firmware versions or higher.  If you are having functional issues then please contact Pentair to get the most current versions for your products.

| | |
|---|---|
| Pentair iLink adapter | Version 1.030 |
| Pentair Indoor Control | Version 1.030 |
| Pentair Outdoor Control | Version 1.030 |

The iLink adapter's version can be checked by monitoring the serial port while applying power to the adapter.  The iLink will output its firmware version to the serial port when it reboots.

The outdoor and indoor control firmware versions can be check by following these instructions:
On the indoor IntelliTouch wall control
1. Press MENU
2. Press SETUP
3. Press ADVANCED
4. Press the 2nd and 4th soft key at the bottom of the display at the same time
5. Press SYSTEM VERSION INFO
6. The version numbers will now be displayed

Version 9 update:
Version 9 changes the operation of the pool and spa heat types inside the module. The module now operates similar to the indoor controller. The indoor controller interlocks the heat types: main heat, solar, solar preferred, and all heat off. The module now mirrors this functionality.

Polling also has been reworked as some values were being missed. The module now checks to see if the iLink returned a string before issuing a new polling request.

**Firmware Upgrades**

Should you need assistance upgrading firmware please contact:

Pentair North America
East (8am to 5pm Eastern)
1620 Hawkins Ave
Sanford, NC 27330
800-831-7133

West (8am to 5pm Pacific)
10951 W. Los Angeles Ave
Moorpark, CA 93021
800-831-7133

www.pentairpool.com

# SystemBuilder Support

Once the module is added to SystemBuilder, you will need to make all the appropriate connections to the system logic and touch panel template that you are using.

In order for the Pentair module to function you first have to drop these modules into your default User Module path.

Pentair_iLink_v8.umc

This path can be found under EDIT>PREFERENCES>USER DATABASE PATHS. Once you have placed the modules in the appropriate folder, be sure to click rebuild.

Next open up your project and select the *Equipment* view.  In the lower right hand corner open the *User Database* and drill down the *By Device Type* until you see Pentair Pool Products. Expand the category until you see the ilink controller. Right click ilink and select add to system.
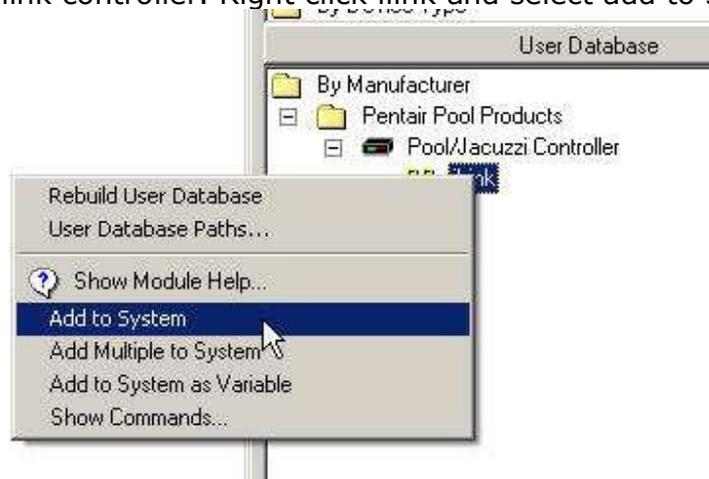
Once you have added the object to your program, you have to setup the parameters for the module. Right click on the object and select *Properties.* Then select I/O Assignment from the left hand pane. Here you should verify that the Serial Settings are correctly set to 9600,N81 with no handshaking.

Next select Audio from the left hand pane and verify that this is NOT defined as a distributed audio source.
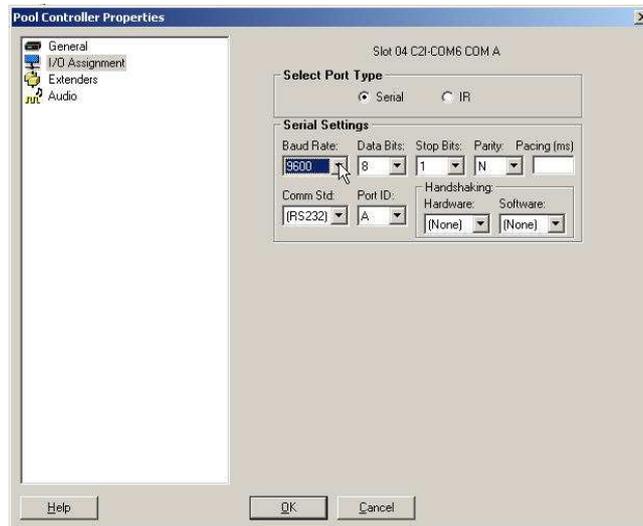


The final step in preparing the module for use is to set the program start to the startup input of the module. This makes the module query the iLink for its current settings and values. To do this select *System* from the programming pane, then select *On System Start* from the *Programmable Events* pane. First, double click in the programming pane to add a step, and add a 2s delay, then click *Apply*.
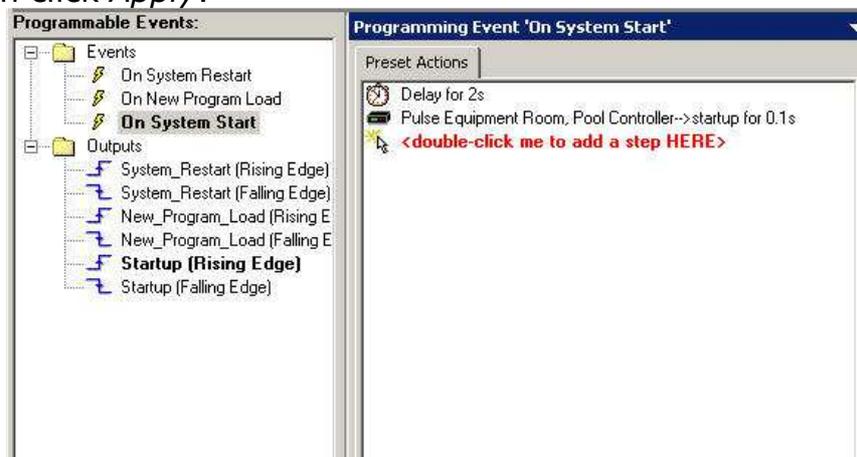


The module is now ready to get tied to your user interface template. Please note that ControlWorks does not offer support on user interface template issues. Please call 888-CRESTRON for specific SystemBuilder technical support.

# Signal and Parameter Descriptions
Bracketed signals such as "[signal_name]" are optional signals


## DIGITAL INPUTS

pool_sp+ .............................................................Pulse to raise the pools set point
pool_sp- .............................................................Pulse to lower the pools set point
[pool2_sp+] ........................................................Pulse to raise the second pools set point. Valid only on Models i9+3S and i5S
[pool2_sp-] ........................................................Pulse to lower the second pools set point. Valid only on Models i9+3S and i5S
[spa_sp+]............................................................Pulse to raise the spa's set point
[spa_sp-]............................................................Pulse to lower the spa's set point
[spa_on]..............................................................Pulse to set the spa on
[spa_off].............................................................Pulse to set the spa off
[spa_toggle]........................................................Pulse to toggle the spa on and off
[pump_on]...........................................................Pulse to set the pump on
[pump_off]...........................................................Pulse to set the pump off
[pump_toggle]......................................................Pulse to toggle the pump on and off
[cleaner_on].........................................................Pulse to set the cleaner on
[cleaner_off] .......................................................Pulse to set the cleaner off
[cleaner_toggle] ..................................................Pulse to toggle the cleaner on and off
[waterfall_on]......................................................Pulse to set the waterfall on
[waterfall_off].....................................................Pulse to set the waterfall off
[waterfall_toggle]................................................Pulse to toggle the waterfall on and off

These signals are interlocked together
[pool_heat_use_heater_only] ...................................pulse to set pool heat to the main heater only
[pool_heat_use_high_heat_only] ..............................pulse to set pool heat to the high heater only.
[pool_heat_use_solar_only] ...................................pulse to set pool heat to solar only
[pool_heat_use_solar_preferred] .............................pulse to set pool heat to solar preferred option
[pool_heat_off].....................................................pulse to turn the pool heat off.

These signals are interlocked together
[spa_heat_use_heater_only] ....................................pulse to set spa heat to the main heater only
[spa_heat_use_solar_only] ......................................pulse to set spa heat to solar only
[spa_heat_use_solar_preferred] ..............................pulse to set spa heat to solar preferred option
[spa_heat_off]......................................................pulse to turn the spa heat off.

[aux1…40_relay_on] ..............................................Pulse to turn the relay on
[aux1…40_relay_off] .............................................Pulse to turn the relay off
[aux1…40_relay_toggle] .........................................Pulse to toggle the relay on and off
[aux41_macro1…aux50_macro10_on] .........................Pulse to turn the internal macro on
[aux41_macro1…aux50_macro10_off].........................Pulse to turn the internal macro off
[aux41_macro1…aux50_macro10_toggle]....................Pulse to toggle the internal macro
[aux1…8_dimmer+] ...............................................Pulse to raise the dimmer level in increments of 10 starting at 30%
[aux1…8_dimmer-] ................................................Pulse to lower the dimmer level
[all_lights_on] ......................................................Pulse to activate all lights
[all_lights_off] .....................................................Pulse to deactivate all lights
[colorswim] .........................................................Pulse to activate the colorswim function(only available on Sam, Sal, PG2000, and IntelliBrite units)
[colorset] ............................................................Pulse to activate the colorset function(only available on Sam, Sal, PG2000, and IntelliBrite units)
[colorsync]...........................................................Pulse to activate the colorsync function(only available on Sam, Sal, PG2000, and IntelliBrite units)

[intellibrite_set_party_mode] ....................................Pulse to set ALL IntelliBrite units to Party mode(only available on IntelliBrite units)

[intellibrite_set_romance_mode]................................Pulse to set ALL IntelliBrite units to romance mode(only available on IntelliBrite units)

[intellibrite_set_caribbean_mode] .............................Pulse to set ALL IntelliBrite units to caribbean mode(only available on IntelliBrite units)

[intellibrite_set_american_mode]...............................Pulse to set ALL IntelliBrite units to american mode(only available on IntelliBrite units)

[intellibrite_set_sunset_mode]..................................Pulse to set ALL IntelliBrite units to sunset mode(only available on IntelliBrite units)

[intellibrite_set_royalty_mode] ..................................Pulse to set ALL IntelliBrite units to royalty mode(only available on IntelliBrite units)

[intellibrite_set_blue_mode]......................................Pulse to set ALL IntelliBrite units to blue(only available on IntelliBrite units)

[intellibrite_set_green_mode]....................................Pulse to set ALL IntelliBrite units to green(only available on IntelliBrite units)

[intellibrite_set_red_mode] .......................................Pulse to set ALL IntelliBrite units to red(only available on IntelliBrite units)

[intellibrite_set_white_mode] ....................................Pulse to set ALL IntelliBrite units to white(only available on IntelliBrite units)

[intellibrite_set_magneta_mode] ...............................Pulse to set ALL IntelliBrite units to magenta(only available on IntelliBrite units)

[intellibrite_set_hold_mode]......................................Pulse to set ALL IntelliBrite units hold/stop/freeze(only available on IntelliBrite units)

[magicstream_thumpers_toggle] ...............................Pulse to toggle ALL MagicStream thumpers on or off(only available on MagicStream units)

[magicstream_set_hold_mode]..................................Pulse to set ALL MagicStream units hold/stop/freeze(only available on MagicStream units)

[magicstream_set_reset_mode]..................................Pulse to reset ALL MagicStream units(only available on MagicStream units)

[magicstream_toggle_modes]....................................Pulse to toggle ALL MagicStream units to random, party, sync(only available on MagicStream units)

[magicstream_set_sync_mode] .................................Pulse to set ALL MagicStream units to sync mode(only available on MagicStream units)

[magicstream_set_random_mode].............................Pulse to set ALL MagicStream units to random mode(only available on MagicStream units)

[magicstream_set_party_mode] .................................Pulse to set ALL MagicStream units to party mode(only available on MagicStream units)

Note: The above lighting functions have no real time feedback associated with them due to the nature of pool lighting and the lack of communication between the fixture and the pool controller.

[reboot_ilink].........................................................Pulse to software reboot the iLink adapter

[startup] ...............................................................Pulse on startup to retrieve current i-Link settings and synchronize module feedback. Pulsing this input will also setup the adapter to report changes in an unsolicited manner. You do not need to continuously poll the adapter.

## ANALOG INPUTS
[set_pool_setpoint] ....................................................Drive with an INIT symbol to force the pool set point to a value directly

[set_pool2_setpoint] ..................................................Drive with an INIT symbol to force the pool 2 set point to a value directly. Valid only on Models i9+3S and i5S

[set_spa_setpoint] ....................................................Drive with an INIT symbol to force the spa set point to a value directly


## SERIAL INPUTS
pentair_rx$ ............................................................Route from the iLink com port RX line

## DIGITAL OUTPUTS

[spa_on_fb] ....................................................High when spa mode is selected
[spa_off_fb] ...................................................High when spa mode is not selected (pool mode)
[pump_on_fb] ................................................High when the pump is active
[pump_off_fb] ................................................High when the pump is not active
[pump_lowspeed_fb] ....................................High when the pump is in low speed mode
[pump_hispeed_fb] ........................................High when the pump is in high speed mode
[cleaner_on_fb] .............................................High when the cleaner function is on
[cleaner_off_fb] .............................................High when the cleaner function is off
[waterfall_on_fb] ...........................................High when the waterfall is on
[waterfall_off_fb] ..........................................High when the waterfall is off

These signals are interlocked together
[pool_heat_use_heater_only_fb].....................high when pool heat is set to the main heater only
[pool_heat_use_high_heat_only_fb]...........................high when pool heat is set to the high heater only.
[pool_heat_use_solar_only_fb]....................................high when pool heat is set to solar only
[pool_heat_use_solar_preferred_fb]..............................high when pool heat is set to the solar preferred option
[pool_heat_off_fb] .......................................high when the pool heat is off.

These signals are interlocked together
[spa_heat_use_heater_only] ....................................high when spa heat is set to main heater only
[spa_heat_use_solar_only] ....................................high when spa heat is set to solar only
[spa_heat_use_solar_preferred] ..............................high when spa heat is set to solar preferred option
[spa_heat_off].......................................................high when the spa heat is off.

[aux1…40_relay_on_fb] ..............................................High when the aux relay is on
[aux1…20_relay_off_fb] ..............................................High when the aux relay is off
[aux41_macro1…aux50_macro10_on_fb].....................High when the macro is on
[aux41_macro1…aux50_macro10_off_fb] ...................High when the macro is off
[all_lights_on_fb]..................................................High when the all lights mode is on
[all_lights_off_fb]..................................................High when the all lights mode is off
[operation_mode_auto_fb].......................................High when the controller is in the automatic mode of operation
[operation_mode_service/timeout_fb] ........................High when the controller is in either the "service" or "timeout" mode of operation
[startup_busy]......................................................High during startup sequence

## ANALOG OUTPUTS

[pool_setpoint] ..........................................................Pool temperature set point in degrees Fahrenheit
[pool_temperature] .................................................Pool temperature in degrees Fahrenheit
[pool_setpoint2] .......................................................Second set point in degrees Fahrenheit. Valid only on Models i9+3S and i5S
[spa_setpoint] ............................................................Spa set point in degrees Fahrenheit
[spa_temperature] ...................................................Spa temperature in degrees Fahrenheit
[air_temperature] ....................................................Air temperature in degrees Fahrenheit

## SERIAL OUTPUTS

pentair_tx$ ...............................................................Route from the iLink com port TX line
aux1…8_dimmer_level$ .............................................Displays the current dimmer level

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## PARAMETERS

Poll after reboot ......................................................**Poll after iLink reboot [1d]** = the module will poll all values when it sees the the iLink adapter reboot.  Also sets the COSMSG value so the adapter will send new values in an unsolicited manner.

.............................................................................**Don't poll after iLink reboot [0d]** = module does nothing after it sees the iLink adapter reboot

# Support

This module is supported by ControlWorks Consulting, LLC. Should you need support for this module please email support@controlworks.com or call us at 440-449-1100 option 1. ControlWorks normal office hours are 9 AM to 5 PM Eastern, Monday through Friday, excluding holidays.

Before calling for support, please ensure that you have loaded and tested operation using the included demonstration program and touchpanel(s) to ensure that you understand the correct operation of the module. It may be difficult for ControlWorks to provide support until the demonstration program is loaded.

Updates, when available, are automatically distributed via Email notification to the address entered when the module was purchased. In addition, updates may be obtained using your username and password at http://www.controlworks.com/customerlogin.aspx.

# Distribution Package Contents

The distribution package for this module should include:

Pentair_iLink_v9.umc ...................................................Pentair Crestron User Module
Analog_to_variable_length_serial_v2cw.umc .................Supporting Crestron User Module
Pentair_iLink_Demo_XPANEL_v9.vtp ...........................Demo XPANEL file for eControl
Pentair_iLink_Demo_Program_v9.smw .........................Demo program for MC3 processor
Pentair_iLink_Help_v9.pdf...........................................This help file
Analog_to_variable_length_serial_v9_help_file.pdf.........Help file for supporting module

# Revision History

V9 caleb@controlworks.com 2014.06.05
-Changed pool and spa heat inputs and feedback to mirror the indoor controller
-changed startup polling logic as values were being missed.
    -added a 15 second timeout that stops polling when no value is received as the tx$ is closed during polling.

V8 jim@controlworks.com 2012.12.28
-Added inputs to directly set pool, pool2 and spa set points
-Added poll at startup logic options as a parameter
-Added reboot_ilink input to trigger a software reboot

V7 gary@controlworks.com 2011.3.28
-Added Series 3 compatibility

V6 caleb@controlworks.com 2010.7.23
-Added SystemBuilder compatibility

V5 caleb@controlworks.com 2009.11.09
-Added IntelliBrite and MagicStream light functions.
-Tweaked colorswin, colorset, and colorsync functions to let the user know they are only available on a Sam, Sal, PG2000 and IntelliBrite unit.

V4 caleb@controlworks.com 2008.10.23
-added discretes for spa, pump, cleaner, waterfall, pool heat, pool2 heat, spa heat, pool solar, spa solar, pool solar preference, spa solar preference
- added AUX21-50…41-50 are internal macros to the ilink
- added all lights on and all lights off and its feedback.
-removed polling for colorswim, colorst, and colorsync as it's not something you can poll.
-added module expansion signals to hide the relays and dimmer until needed.

V3 jim@controlworks.com 2008.05.23
-Exposed all lights controls
-Exposed all color functions

V2 lincoln@controlworks.com 2008.02.04
-Exposed OPMODE feedback for new i-Link firmware revision

V1 jim@controlworks.com 2006.11.10
-Initial release
Note: This module does not support the following functions:
    -ALLIGHTS feedback & control
    -COLORSYNC feedback & control
    -COLORSET feedback & control
    -COLORSYNC feedback & control
    -OPMODE feedback

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# Development Environment

This module version was developed on the following hardware and software.  Different versions of hardware or software may or may not operate properly.  If you have questions, please contact us.

| Pentair Hardware | Software Version |
|---|---|
| iLink | 1.030 |
| System I9+3 Outdoor Control | 1.030 |
| System I9+3 Indoor Control | 1.030 |
|  |  |
| **Crestron Hardware** | **Firmware Version** |
| Crestron MC3 Processor | 1.005.0015 |
|  |  |
| **Software** | **Software Version** |
| Crestron SIMPL Windows | 4.01.10 |
| Crestron Vision Tools Pro-e | 5.1.05 |
| Device Database | 47.00.005.00 |
| Crestron Database | 36.00.007.00 |
| Crestron Toolbox | 2.34.069.03 |
| Symlib.tio | 843 |
| Iodev.tio | 843 |
| Include4.dat | 1.14.011 |

**Important Note:**  Your installation's iLink adapter, Indoor and Outdoor controls should have the above firmware versions or higher.  If you are having functional issues then please contact Pentair to get the most current versions for your products.

# ControlWorks Consulting, LLC Module License Agreement

**Definitions:**

*ControlWorks*, *We*, and *Us* refer to ControlWorks Consulting, LLC, with headquarters located at 701 Beta Drive, Suite 22 Mayfield Village, Ohio 44143-2330. *You* and *Dealer* refer to the entity purchasing the module. *Client* and *End User* refer to the person or entity for whom the Crestron hardware is being installed and/or will utilize the installed system. *System* refers to all components described herein as well as other components, services, or utilities required to achieve the functionality described herein. *Module* refers to files required to implement the functionality provided by the module and may include source files with extensions such as UMC, USP, SMW and VTP. *Demo Program* refers to a group of files used to demonstrate the capabilities of the Module, for example a SIMPL Windows program and VisionTools Touchpanel file(s) illustrating the use of the Module but not including the Module. *Software* refers to the Module and the Demo Program.

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**Provision of Support**

We provide limited levels of technical support only for the most recent version of the Module as determined by Us. We do not provide support for previous version of the module, modifications to the module not made by Us, to persons who have not purchased the module from Us. In addition, we may decline to provide support if the Demo Program has not been utilized. We may withdraw a module from sale and discontinue providing support at any time and for any reason, including, for example, if the equipment for which the Module is written is discontinued or substantially modified. The remainder of your rights and obligations pursuant to this license will not be affected should ControlWorks discontinue support for a module.

**Modification of Software**

You may not decrypt (if encrypted), reverse engineer, modify, translate, disassemble, or de-compile the Module in whole or part. You may modify the Demo Program. In no event will ControlWorks Consulting, LLC be liable for direct, indirect, incidental or consequential damages resulting from You modifying the Software in any manner.

**Indemnification/Hold Harmless**

ControlWorks, in its sole and absolute discretion may refuse to provide support for the application of the Module in such a manner that We feel has the potential for property damage, or physical injury to any person. Dealer shall indemnify and hold harmless ControlWorks Consulting LLC, its employees, agents, and owners from any and all liability, including direct, indirect, and consequential damages, including but not limited to personal injury, property damage, or lost profits which may result from the operation of a program containing a ControlWorks Consulting, LLC Module or any component thereof.

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