



# Intelligent Lighting Controller™ (ILC-100) Quick Start Guide

**Models:**  
 ILC-100pcb: OEM embedded application/PCB form factor  
 ILC-100m: Standalone/metal enclosure configuration

**Ratings:**  
**Input** 12-26Vdc, 15 ma plus current capacity of supported LEDs  
**Output Rating** Output voltage is identical to input, 6.67amps maximum (80watts @12Vdc or 160watts @24Vdc.

**Description:**  
 The ILC-100x series of LED Controllers are designed to control monochrome and tri-colored (RGB) LED lighting elements. The ILC-100x controller can be controlled through a number of remote User Interfaces, including keypads, dry contact outputs, low-voltage trigger outputs, local and remote Infrared control, IP (Internet Protocol), and computer based signaling sources (RS-232C) such as those manufactured by AMX, Crestron and Elan Home Systems with RS-232-C or 0-10v interfaces.

TO BE INSTALLED AND/OR USED IN ACCORDANCE WITH APPROPRIATE ELECTRICAL CODES AND REGULATIONS

**Important Information:**

- Carefully read the instructions appropriate for your needs.
- This control must be installed by a qualified electrician.
- For supply connections, use wires rated for at least 75 C.
- For indoor use only.
- Do not connect Low-Voltage to Line-Voltage Power.
- Proper short-circuit and overload protection must be provided at the circuit breaker distribution panel. You can use up to a 20A maximum circuit breaker with adequate short-circuit breaking capacity for your installation.
- ILC-100x series controllers should only be used with Class 2 power unit.

Number of Discrete Lighting Systems that can be individually controlled	Load in Amps (Watts) of LED elements that <b>could</b> be supported with each ILC-100x	Length (of typical LED strips with 30/60 LED lamps per meter) that <b>can</b> be supported with each ILC-100x using Class 2 Power Supplies*	Recommended Power Supply for System
1	6.67 amps (80 watts @12Vdc or 160 watts@24Vdc) per each ILC-100x*	Std. Brightness LEDs: 32 ft. (10 m) @12Vdc Enh. Brightness LEDs: 27 ft. (8.33m) @24Vdc per each ILC-100x	60 watts @12Vdc or 100 watts @24Vdc per each ILC-100 to comply with UL req't
2			
-65,025			

\*Class 2 Power Supplies must be used as per UL 2108. Max @12VDC is 60 watts. Max @24Vdc is 100 watts.

**Mounting Instructions**

The ILC-100x comes in a self-contained metal enclosure (an OEM version is available as a PCB only, consult with the factory).

1. Determine a suitable mounting location for ILC-100 close to the LED elements that you wish to control.
2. Utilize the built-in mounting ears and use appropriate screws to affix the unit to a stable surface.

**Supply (Line Input) and LED (Load Output) Wiring Instructions**

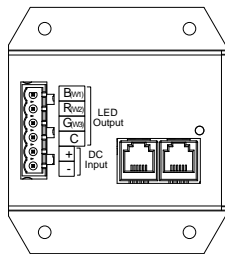


Figure 1

**DC Power Source Connections**

1. If the AC/DC power supply does not have a pre-installed 2-pin power connected attached, strip 1/4" (6mm) of insulation from DC power cord.
2. Connect wires as shown in Figure 1
3. Connect a ground to the DC- Pin

**LED Connection Block**

1. If the interconnect wire furnished with your LED strip does not have a pre-installed 4-pin power connected attached, strip 1/4" (6mm) of insulation from DC power cord.
2. Connect these wires as shown below: (pin 1 is on the top as shown)  
 Pin 1 B(w1) BLUE LED LEAD (-)  
 Pin 2 R(w2) RED LED LEAD (-)  
 Pin 3 G(w3) GREEN LED LEAD (-)  
 Pin 4 C COMMON LEAD (+) COMMON ANODE

**User Control Wiring and Setup Instruction**

In order to control the ILC-100x, a User Interface needs to be connected.

The ILC-100x series of Controllers as well as intelligent controllers manufactured by Converging Systems implement a sophisticated bus architecture (i.e. the CS-Bus) that permits reliable communication using CAT5 wiring, without the need for repeaters, on wiring runs up to 4000 feet. There are two communication ports on each ILC-100-- one socket is a **Powered** connector (Port 0) which provides DC power to connected Interface Devices while the other socket (Port 1) is an **Unpowered** connector which **does not provide external power** to other devices but is designed to relay communication data from one ILC device to another. It is important that proper wiring convention is used when connecting one or more devices. See the appropriate section below for more information here. For ILC-100x to ILC-100x connections, use 3-pair **straight** wiring (1-1, etc.)

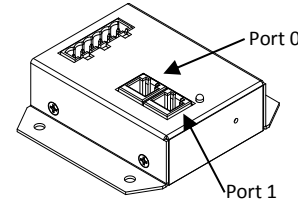


Figure 2

**Wiring Pinouts**

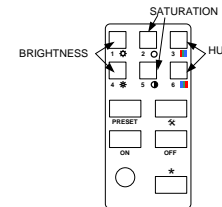
CS-Bus RJ-12 Connector) (LEFT or "OUTPUT" PORT 0) (see Figure 2	CS-Bus RJ-12 Connector) (RIGHT or "INPUT" PORT 1) (see Figure 2	Color Coding*
#1 IR	#1 Not Connected	Blue
#2 GND	#2 GND	Blue-W
#3 485-	#3 485-	Orange
#4 485+	#4 485+	Orange-W
#5 5V DC (regulated)	#5 Not Connected	Green
#6 Not Connected	#6 Not Connected	Green-W

\*Important: With CAT5 wiring maintain twisted pairs as shown above.

**Note:** If multiple ILC-100x controllers (lighting controllers) or if multiple IMC-100 controllers (motor controllers) are required for the installation or if one or more User Control Modules (i.e. keypads, serial adapters, IR receivers, Internet Adapters, etc.) are required for control purposes, communication wire needs to be utilized between the above components in order to enable operation. For more information, see the *ILC Installation Manual* or the *IMC Installation Manual* for more information here.

**Keypad (BSKP-2110L) -- "Intelligent 11-button Keypad for Lighting Control"**

The BSKP-2110 is a CS-BUS compatible intelligent keypad that can be used to control the Hue, Saturation and Lightness of any shade of color. In addition, the keypad allows up to 6 presets to be stored and recalled and enables a particular light setting to be turned OFF and ON with a simple push of a button. Finally, a highly sensitive IR receiver is built into the front of the device so that a supported IR handheld device can be supported as well.

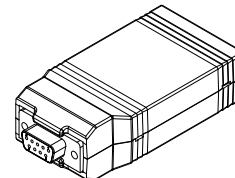


**Keypad Wiring**

1. Create a straight-thru 6 connector cable with RJ-25 (6P6C) connectors on both ends. While flat phone wire can be used for shorter runs (<5ft) CAT5 wire is highly recommended and should be used for longer runs. For CAT5 installations, maintain twisted pairs for pins 1/2, pins 3/4 and pins 5/6.
  2. Plug one end of the communication cable into the back of the BSKP-2110L and the other into Port 0 of the ILC-100.
- Note:** If you plug the communication cable into Port 1 on the ILC-100, no power will be provided to the BSKP-2110L and the keypad will not operate.

**Intelligent Bus Translator (IBT-100) -- "RS-232c to CS-Bus Adapter/Firewall"**

The Intelligent Bus Translator (IBT™) is a robust standalone RS-232-C serial interface converter/firewall for CS-BUS devices. The IBT-100™ is designed to provide the highest degree of circuit protection, isolation and remote connectivity for interconnected equipment. The CS-BUS (based upon the hardware specifications of RS-485) forms the communication backbone for a number of Converging Systems' controller devices including the BRIC and the IMC-100™ intelligent motor controllers.



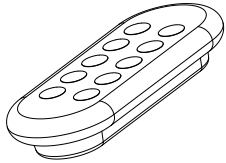
**IBT Wiring**

1. Create a straight-thru 6 connector cable with RJ-25 (6P6C) connectors on both ends. Maintain twisted pairs for pins 1/2, pins 3/4 and pins 5/6.
  2. Plug one end of the communication cable into the back of the IBT-100™ and the other into Port 0 of the ILC-100.
- Note:** If you plug the communication cable into Port 1 on the ILC-100, no power will be provided to the BSKP-2110L and it will not operate.

## Infrared Keypad (ILC-IR-10W1) -- "Handheld IR 10 Button Keypad for Lighting Control"

The ILC-IR-10W1 is an infrared remote device customized to control the ILC-100x family of lighting controllers. It requires an IR receiver that exists in most BSKP keypads. In addition, it is compatible with the standalone IR-EYE (IMC-RIR).

**Warning:** Typical 3-wire IR receivers available from Xantech are not compatible. You will damage your unit if you connect these types of devices. Your warranty will be void if it is determined that you have used these types of devices.



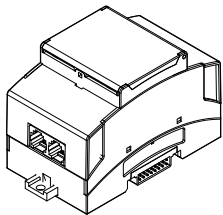
### Infrared Eye Wiring

1. If you are using a BSKP-type keypad with built-in IR receiver, see the instructions above under "BSKP-2110L" for proper wiring.
2. If you are using an IMC-RIR standalone IR receiver, simply plug the provided connector into Port 0 of the ILC-100.

**Note:** If you plug the communication cable from either the BSKP or the RIR into Port 1 on the ILC-100, no power will be provided to the receiving device, and it will not operate.

## e-Node -- "Ethernet to CS-Bus Adapter/Firewall"

The Intelligent Ethernet Protocol Adapter (e-Node™) is a state-of-the-art Intelligent Internet Protocol controller which is designed to enable wired or wireless (Ethernet) control of nearly a limitless range of facility automation clients/devices. The unique controller is connected to any facilities or home automation client/device that supports RS-232-C or RS-485 connectivity. A single e-Node™ can control an entire network of IMC-100x and/or ILC-100™ devices.



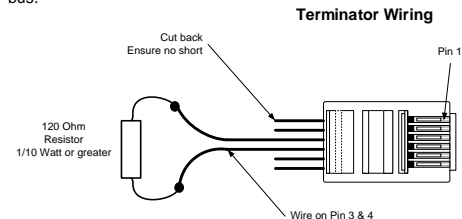
### e-Node Wiring

1. Create a straight-thru 6-conductor cable with RJ-25 (6P6C) connectors on both ends. Maintain twisted pairs for pins 1/2, pins 3/4 and pins 5/6.
2. Plug one end of the communication cable into the left port of the e-Node (port 0) and the other into Port 0 of the ILC-100.

**Note:** In normal operation, either RJ-25 port on the e-Node™ is configured to send and received CS-Bus traffic. See the e-Node™ User Manual for alternative options to reconfigure the ports to other communication protocols.

## End-of-Bus Line Terminators

The CS-Bus is designed around end-of-bus resistor termination. This guarantees error-free communication despite external noise and other sources of interference. It is highly advised that when more than one ILC-100x Controller is interconnected, one terminator is placed on one end of the bus and another terminator is placed on the other end of the bus. It does not matter into which CS-Bus port these terminators are connectors so long as they are at the very beginning of the bus and the very end of the bus.



RJ Pin	Connection
#1	No connect
#2	No connect
#3	120 ohm resistor
#4	120 ohm resistor
#5	No connect
#6	No connect

**Note:** The IBT-100 and BSKP Keypads have a built-in terminator so **no** additional terminating resistors are needed on the end of the bus that the IBT-100 or keypad is installed. Keypads have rear-mounted jumpers to select termination on or off (connected pins is on), while other peripherals such as IR receivers do not have built-in terminating resistors, so a terminating resistor is required.

## Power On/Testing

**IMPORTANT: MAKE SURE THAT THE DC POWER TO ALL CONTROLLERS IS TURNED OFF PRIOR TO CONTINUING.**

1. Make sure that you have installed at least one ILC-100x Controller and one User Interface Control (BSKP-2110L, IR-EYE with IR remote, or IBT or e-NODE™ with external computer).
2. Verify that you have connected an approved LED lighting strip into the ILC-100 controller.
3. Power on all ILC-100x Controllers (and e-Node™ if connected to system).
4. Issue the following command from any connected User Interface Control and verify that the LED illuminates and starts going through a color shifting test pattern. If you see this pattern, you have confirmed the proper operation of your ILC-100 system.

User Interface Device	Action
BSKP-2110L Keypad	Depress a preset button
ILC-IR-10W IR Handheld remote (with attached IR-EYE)	Depress a preset button
IBT-100 with remote computer *	#0.0.0.LED=RECALL_2<CR>
e-Node with remote computer using Pilot app *	#0.0.0.LED=RECALL_2<CR>

\*refer to the commissioning guide and CS Messaging guide for more information

## Controlling the ILC-100x

The ILC-100x Controllers contain a sophisticated color computer that can be used to select any "color" from a palette of nearly 16 millions possible choices. Rather than expecting the user to be a seasoned color scientist who well understands how to precisely mix the three primary colors of **Red**, **Green**, and **Blue**, (the constituent components from which all color of light can be created), the ILC-100x Controller implements a unique color selection tool similar to what is integrated within a color television works.

On each of User Interface Controls that can be used to choose, save and recall a color within the ILC-100x Controllers, there are three basic controls that must be understood in order to proceed. These controls are as follows:

**Hue Control:** Hue is the color. There are two controls available with this operator—UP and DOWN. Selecting UP, shifts from red -> green -> blue, while selecting DOWN shifts red->blue->green

**Lightness Control:** Lightness is typically synonymous with the relative darkness or lightness of a color.—UP and DOWN. Selecting UP increases the **Lightness**, while selecting DOWN, decreases the **Lightness**.

**Saturation Control:** Saturation is typically synonymous with the purity of the hue; degree of difference from a gray of the same lightness or brightness. There are two controls available with the operator—UP and DOWN. Selecting UP increases the **Saturation** the color becomes more pure, while selecting DOWN, decreases the **Saturation**, and the color becomes more "washed out" or paler.

## Steps to Select and Recall a "Color" using a BSKP-2110L Keypad or ILC-IR-10W1 IR Remote

1. **Activate LED.** To quickly activate one or more default factory presets and further test your system, depress the Preset button and then select one of six keypad or IR presets (i.e. 1,2,3,4,5,6). The connected LEDs should change color from their previous setting to a factory programmed default for that particular Preset. If the LEDs do not illuminate, check your wiring, and make sure that your power supply is properly connected. If you may have inadvertently written over an "OFF" setting to a particular Preset, try each additional Preset until the LEDs come alive. Now proceed to the next step.
2. **Select Hue.** Provided that there is some illumination being generated from the LEDs, press and release the **Tool button and then press and hold the Hue+ button** and you should see a distinct color shift over the next 10-15 seconds which will automatically circle around the entire color wheel. Once you have found a "color" which is roughly what you desire, release the **Hue +** button and the newly discovered color will "freeze." You can alternatively push the **Hue –** button (within a six second window) and see the colors rotate the opposite direction over the next 10-15 seconds until they come full circle to the original color. Once you have "rediscovered" the original "color" that you previously selected, proceed to the next step.
3. **Select Lightness.** Next, to alter the Lightness of the previously selected "color," press and release the **Tool button and then press and hold the Lightness + button** and you should see a distinct brightening of the previously selected "color." Alternatively, select the **Lightness – button** (within a six second window) and you should see a distinct darkening of the previously selected "color." You can always return an previously selected "color" by either selecting the **Lightness + button or the Lightness – button**. Once you have "rediscovered" the original "color" that you previously selected proceed to the next step.
4. **Select Saturation.** Next, to alter the Saturation of the previously selected "color," press and release the **Tool button and then press and hold the Saturation + button** and you should see a distinct change in the saturation of the color. Alternatively, select the **Saturation – button** (within a six second window) and you should see a distinct de-saturation of the previously selected "color." You can always return an previously selected "color" by either selecting the **Saturation + button or the Saturation – button**. Once you selected the correct Saturation value, you can now save the chosen "color" made of up discrete parameters relating to **Hue**, **Lightness**, and **Saturation**. If you decide at any time that you wish to tweak your newly discovered "color," simply revisit steps 2, 3 or 4 once again.
5. **To Save a Color.** On the BSKP-2110L, press and hold a preset button for 6 seconds until you hear a beep, then release. On the ILC-IR-10W1 IR remote, press and release the bottom left "Store" button and then toggle one of the top 6 Preset buttons. These special keypad actions will store that particular color into that particular Preset location. Once you have saved your "color," you can recall that specific "color" by following the above directions again for your particular User Interface Device.
6. **To Recall a Color.** On the BSKP-2110L, toggle the "Preset" button and then select one of the six Preset buttons into which a particular color has been stored. On the ILC-IR-10W1 IR remote, toggle the "P" (Preset) button and then select one of the six Preset buttons into which a particular color has been stored. You can recall up to six colors through this process.

## Resetting and Discovery of the ILC-100x

There is a small hole on the side of the ILC next to the LED indicator. Place a small tool (paper clip) into the hole to sense a push button. Pushing this button is used primarily for commissioning and setting addresses (see commissioning manual). However it can also serve as a reset of the ILC to the factory default. After pushing the button the LED will go off. Maintain depressing the button, and after a short time the LED will flash. Keep the button depressed until the LED has flashed three times, and then release. The ILC will set all its parameters to the factory default, and reset itself.