Converging Systems -- LED Product Family Catalog
A Complete Guide to Converging Systems' CS-Bus LED Controller Technology

CONVERGING SYSTEMS INC.

Converging Systems' LED Controller and Flexible LED Arrays Product Matrix

Networkable LED Architectural Lighting Systems

Philips LED Patent Licensing Partner

From the developers of color imaging technology for the largest ink-jet and laser printer manufacturers comes the ILC-100™ networkable LED color controller and compatible LED full color lighting devices. The ILC-100 provides gamma-corrected color rendering and enables 12-bit dimming capabilities. Unlike traditional LED mixing and diming technology that violates Philips Electronics patents, Converging Systems' LED technology is under license and unique.

Device compatibility with the popular residential and commercial automation systems including Crestron, AMX, Control 4, Elan Home Systems and most recently Savant brings ease-of-installation for the installer. Field-proven in some of the top home theaters in the world and protected under license from Philips Electronics, Converging Systems' LED technology enables dealers to uniquely differentiate themselves from their competition.

Photography:
Audio Video Zone,
Tustin, CA

Product No. / Features

FLLA-Full Color LED Lighting Arrays

FLLA-RGB100-12-Standard Brightness-Dry Location

Max Length per Feed: 5.0m (16.4')
Available Lengths: 1.0m, 3.0m, 5.0m

FLLA-RGB100-12-Standard Brightness-Damp Location-IP54

Max Length per Feed: 5.0m (16.4')
Max Single Length: 10cm, 20cm, 50cm, 1.0m, 3.0m, 5.0m

Most Popular

FLLA-RGB100-12-Standard Brightness-Damp Location-IP67

Max Length per Feed: 5.0m (16.4')
Max Single Length: 1.0m, 3.0m, 5.0m

FLLA-RGB100-24-Enhanced Brightness-Dry Location

Max Length per Feed: 5.0m (16.4')
Max Single Length: 1.0m, 3.0m, 5.0m

FLLA-RGB100-24-Enhanced Brightness-Damp Location-IP54

Max Length per Feed: 5.0m (16.4')
Max Single Length: 10cm, 20cm, 50cm, 1.0m, 3.0m, 5.0m

FLLA-RGB100-24-Enhanced Brightness-Damp Location-IP67

Max Length per Feed: 5.0m (16.4')
Max Single Length: 1.0m, 3.0m, 5.0m

Product No. / Features

LED Networkable Controllers

ILC-100 Intelligent Lighting Controller

Max. Linear Feet Supported: 12.2m (40') @ 6.67amps (Std. Brightness)
Max. Number Controllers Addressable: 16.5 million

Keypad Compatible Devices

BSKP-2110-L Intelligent Lighting Keypad

Max. Bus Length to Controller: 1219m (4000')
Max. Number Keypads per Single ILC-100: 3

Communication Adapters

IBT-100 CS-Bus Serial Adapter

Max. Bus Length to RS-232-C Controller: 1219m (4000')
Enables Compatibility with Popular Automation Systems

e-Node Ethernet Adapter

Enables up to 255 ILC-100 to be networked together per leg (16.5 million total)
Enables Compatibility with Automation Systems

Accessory Items

Accessory/Installation Devices

Installation Accessories to Simplify Installation
Wide Range of Accessories Available

Watts/Ft.	DC Volts	Lumens/Ft.	Color Range	Attached Leader Cable	Min. Cut Length	Notes	Diagram
2	12	43	16.9m	No	0.1m (3.97")	Requires Leader Cable FLLA-LC-15	
2	12	43	16.9m	No	0.1m (3.97")	Requires Leader Cable FLLA-LC-15	
2	12	43	16.9m	Yes	0.1m (3.97")	Includes attached IP67-rated Leader Cable	
4	24	43	16.9m	No	0.05m (1.99")	Requires Leader Cable FLLA-LC-15	
4	24	86	16.9m	No	0.05m (1.99")	Requires Leader Cable FLLA-LC-15	
4	24	86	16.9m	Yes	0.05m (1.99")	Includes attached IP67-rated Leader Cable	

Power Req't	CS-Bus Ports	Max Amp Output	I/R Comp.	RS-232c Comp.	Ethernet Comp.	Notes	Diagram
12-48 v DC	2	6.77	Via CS-Bus sensor	Via IBT-100	Via e-Node	Up to 255 per e-Node, Up to 16.5m devices per network.	

Power Req't	CS-Bus Ports	Max Bus Length	I/R Comp.	Presets	Switches	Notes	
Via CS-Bus connection	1	4000' (1219m)	Via on-board receiver	6 Presets, 1 Effect	Hue, Saturation, Brightness, On/Off	Up to 3 keypads per single ILC-100 device. Note: add'l keypads require add'l ILC-100 devices.	

Power Req't	CS-Bus Ports	Web Page Support	Max run to CS-Bus device	Communi-cation	Bus I/O.	Notes	
Via CS-Bus connection	1	No	4000' (1219m)	RS-232-C	CS-Bus	Device can also program CS-Bus devices with new F/W. Note: Not required to update e-Node firmware.	
Via external 12v DC 250ma adpt.	2	Yes	4000' (1219m)	Ethernet	CS-Bus, Serial	Supports iPad, Android and standard Browsers with web-page support.	

Cables	Connectors	Splitters	IR Handhelds	Pilot Software	Ethernet Comp.	Notes	
Yes	Yes	Yes	Yes	Yes	Yes	See www.convergingsystems.com for the latest accessories	

ILC-100 Intelligent Lighting Controller Specification Sheet

Low-Voltage Networkable Color Changing (RGB) LED Controller
(patents licensed from Philips Electronics)

Cat. No. ILC-100 - _____

Description:

The ILC-100C is networkable controller for either single or full color LED lamps/arrays. Any hue from over 16 million can be user selected, saved, and dimmed to any level. An embedded color computer permits any hue to be selected with a simple button push and no special training.

Construction:

Small format PCB with built-in detachable DC input and LED output connectors, and dual communication bus allows interconnection of up to 255 controllers per leg of bus (and up to 16.5 million controllers network-wide). Accessory metal mounting enclosure (-MME) enables controller to be mounted outside of a standard NEMA chassis.

Electrical:

Supports 12v to 48v DC LED single color (2-wire) and RGB-color changing (4-wire) LED elements. Input DC current must match rated LED output requirements. **Important: ILC-100 series controllers are to be fed from Class II UL Listed power supplies.**
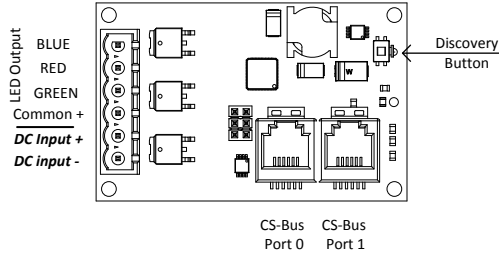
Mounting:

PCB version can be mounted in NEMA enclosures. Controller with -MME option can be mounted using built in mounting ears. Designed for dry locations.
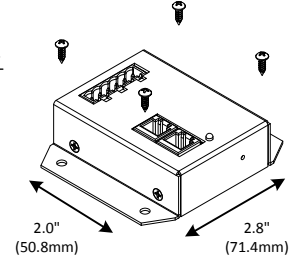
Applications:

- Soffit lighting   •Navigational / Accessibility Lighting
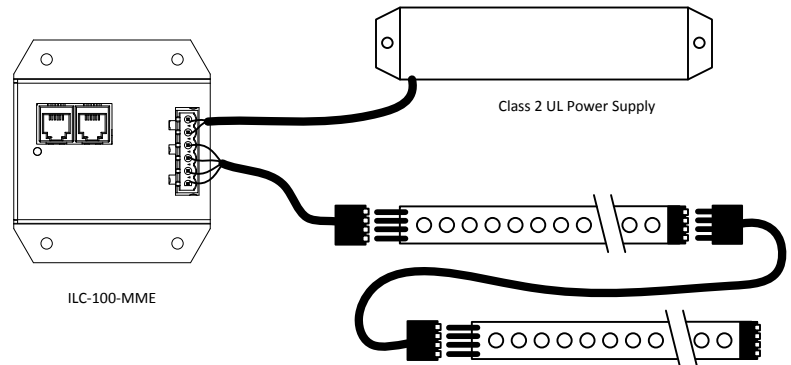- Decorative   • Ambient   •Focal Point •Home automation - Ethernet and Serial control
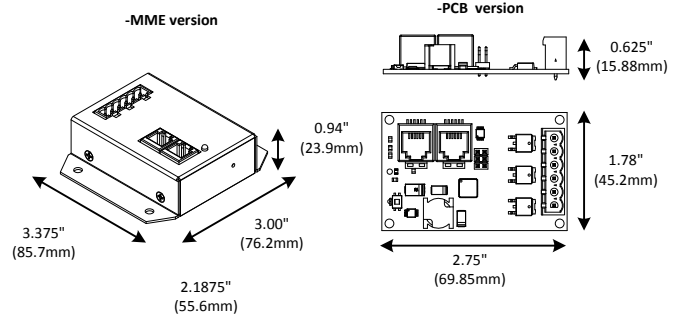
Connectors

LED Output: BLUE, RED, GREEN, Common +, *DC Input +*, *DC input -*

Discovery Button

CS-Bus Port 0   CS-Bus Port 1

Mounting

2.0" (50.8mm)   2.8" (71.4mm)

Single ILC-100 driving two FLLA strips in series

ILC-100-MME

Class 2 UL Power Supply

Dimensions

-MME version

0.94" (23.9mm)

3.375" (85.7mm)   3.00" (76.2mm)

2.1875" (55.6mm)

-PCB version

0.625" (15.88mm)

1.78" (45.2mm)

2.75" (69.85mm)

ILC-100 Specification

Voltage:	12v -48v DC
Max Current Out:	6.67 amps
Network:	CS-Bus
Color Temp:	Variable
Add'l I/O:	RS-232/Ethernet
Colors:	16.9 million
Power Supply:	Class 2 UL
Mounting:	Screws, standoffs
Warranty:	1yr

Power Supply Specification

Voltage:	Volts match load
Class 2 (12v rating):	12v DC @80w.
Class 2 (24v rating):	24v DC@100w.
Cabling to ILC-100:	FLLA-LC-15
Mounting:	Mfg instructions
Rating:	UL Class 2

Model No.	Enclosure Type
ILC-100	PCB-Printed Circuit Board with 4 mounting holes which can be mounted using commercially available standoffs to third-party provided mounting enclosures MME-Custom metal enclosure with two mounting ears.

FOR CURVILINEAR APPLICATIONS OR TO CONTINUE RUN—SPECIFY FLLA-IC-13
Note: Please order one FLLA-LC-15 for powered-end of FLLA-RGB100 LED strips (Dry and IP-54 only).
Note: If product comes with Class 2 power supply, the supply is listed by agencies referenced by logos on this page.

Ordering Example:

ILC-100 – MME
Enclosure Type

Converging Systems Inc.

FLLA-Flexible Linear Lighting Arrays Specification Sheet
Low-Voltage Color Changing (RGB) LED Elements

Date:

Type:

Cat. No. FLLA-RGB100 - _____ - _____ - _____ - _____

Description:

The FLLA is an ingenious, easy-to-install family of color changing LED elements that are designed to work seamlessly with the ILC-100 Intelligent Lighting Controller to generate virtually any color of illumination (including white).

Construction:

30 (Std. brightness-SB) or 60 (Enhanced brightness-EB) LED RGB diodes implemented per meter. Maximum length of 5 meters of continuous run. Longer lengths require a separate power feed to head-end of LED strip. Standard packaging: Dry (dry locations); IP54 (standard water resistant for moist locations-recommended); IP67 (super water resistant with sealed power connector).

Electrical:

SB--12v DC. 2.0 watts/foot. 43 lumens/foot. EB-24v DC. 4.0 watts/foot. 86 lumens/foot. **Important: LED strips are to be fed from Class II UL Listed Power Supplies.**

Mounting:

Mounts onto solid surface with factory-attached 3M double-sided adhesive strips. Water-resistant versions can be mounted using silicon straps and screws where moisture content may make adhesive strip weaken over time.
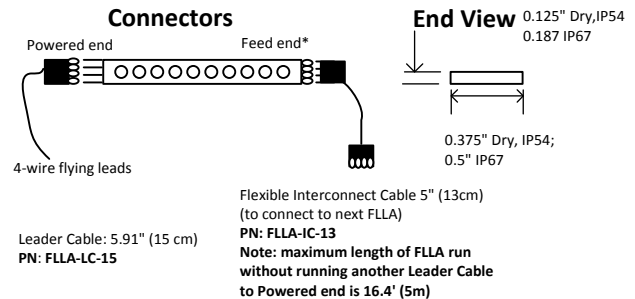
Applications

•Soffit lighting •Navigational / Accessibility lighting •Decorative • Ambient •Focal Point •Home automation-- Ethernet and Serial control.

Connectors

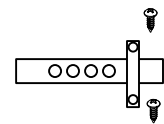Powered end   Feed end*

4-wire flying leads

Leader Cable: 5.91" (15 cm)
PN: **FLLA-LC-15**

Flexible Interconnect Cable 5" (13cm)
(to connect to next FLLA)
PN: FLLA-IC-13
Note: maximum length of FLLA run without running another Leader Cable to Powered end is 16.4' (5m)

End View 0.125" Dry,IP54
0.187 IP67

0.375" Dry, IP54;
0.5" IP67

Mounting Clip Detail

1.25" x .1875" silicone clip

Kit: 10 Silicone Clips
w/ 20 screws
PN FLLA-SC-10

LED Specification-SB

Voltage:	12v(DC
Watts:	2.0 Watts/aft
Lumens/ft.:	43 (R+G+B-all on)
Color Temp:	Variable
Bean Spread:	120°
Max. Run:	16.4' (5m)
Max. Single Length:	16.4' (5m)
Mounting:	3M tape, clips
Warranty:	1yr

LED Specification-EB

Voltage:	24v (DC)
Watts:	4.0 Watts/ft.
Lumens/ft.:	86 (R+G+B all on)
Color Temp:	Variable
Bean Spread:	120°
Max. Run:	16.4' (5m)
Max. Single Length:	16.4' (5m)
Mounting:	3M tape, clips
Warranty:	1yr

Model No.	DC Voltage	Brightness	IP Rating	Length (metric/SAE)
FLLA-RGB100	12, 24	SB (Std. Brightness-30 LEDS/m), EB (Enhanced Brightness-60 LEDs/m)	Dry, IP54, IP67	010 (0.1m;3"15/16"), 020 (0.2m;7"7/8"), 050 (0.5m; 19"11/16"), 100 (1.0m; 39"3/8"), 300 (9' 10"1/8";3m), 500 (16'4"7/8")

FOR CURVILINEAR APPLICATIONS OR TO CONTINUE A RUN—SPECIFY FLLA-IC-13

Note: Please order one FLLA-LC-15 for powered-end of FLLA-RGB100 LED strips (Dry and IP54 only)

Note: Maximum length of FLLA run by daisy-chaining one strip to another is 16'4"7/8" (5m)

Ordering Example:

FLLA – RGB100 - 12 - SD - DRY - 500

Voltage   Brightness   IP Rating   Length (cm)

Converging Systems Inc.

BSKP-Family of Intelligent Keypads Specification Sheet
CS-Bus™ Wall-Mounted Keypads

Cat. No. BSKP-____ - ____

View

BSKP 2110-L
BSKP 2110-M
BSKP 2116-M

BSKP 2050-M

BSKP 2030-M

BSKP 2020-L
BSKP-2020-M

Description:
The BSKP-family of intelligent keypads enable wired control of CS-Bus lighting and motor control devices with some models also providing a built-in infrared receiver for remote operation. For the ILC-100 LED lighting controller, the -2110-L model provides complete control of color, and provides the ability to save and recall 6 settings plus additional lighting effects in addition to normal OFF and ON control. For the IMC-100 family of motor controllers, the -2030-M, -2050-M, -2110-M and -2116-M keypads provide from 3 to 5 to 10 buttons for precise control of motor operations (with IR receiver). The -2020-L and -2020-M configurations (for lighting and motors) are Decora®-type paddle switch with on-board LED indicators for lighting and motor presets as well as quick ON and OFF settings.

Construction:
Small format single-gang wall pads configured with a built-in RJ-25 connector to make interconnection easy with any CS-Bus device. The -2030/2050/2110 series comes in standard white. The -2020 is available in standard white with other colors optionally available.

Electrical:
Self-powered from DC voltage available on standard CS-Bus lines. Up to three (3) keypads can be connected to each ILC-100 controller while up to two (2) keypads can be connected to each IMC-100 controller.
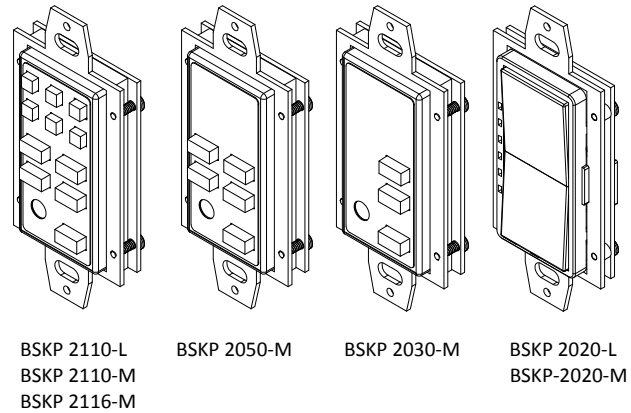
Mounting:
Mounts in the same space as a standard single gang keypad. Designed for dry locations.

Mounting Detail

0.8"
(20 mm)

Applications
•Control of ILC-100 lighting controllers •Control of IMC-100 family of motor controllers*

Connectors

RJ25
CS-Bus

BSKP-20X0-L Specification	
Control Type:	Lighting
Bus Compatibility:	CS-Bus
Buttons	2/3/5/10
Max/CS-Bus Length:	4000' (1219m)
Max per ILC-100:	3
Pwr. Req't:	70ma@5vdc
Mounting:	Wall box
Warranty:	1yr

BSKP-20X0-M Specification	
Control Type:	Motors
Bus Compatibility:	CS-Bus
Buttons:	2/3/5/10
Max/CS-Bus Length:	4000' (1219m)
Max per IMC-100:	2
Pwr. Req't:	70ma@5vdc
Mounting:	Wall box,
Warranty:	1yr
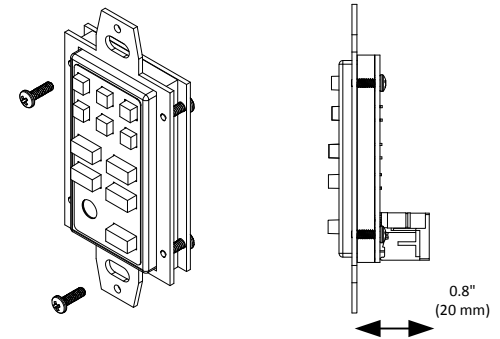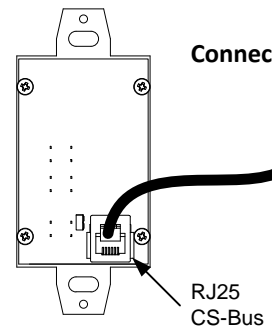
Model No.	Button Configuration	Device Control Type
BSKP	2020-(Decora-type paddle with IR indicators) 2030-(Three button with IR 2050-(Five button with IR) 2110-(10 button with IR) 2116-(10 buttons with IR/presets)	L-(LED Lighting Control—for ILC-100) M-(Motor Control—for IMC-100x family)

REQUIRES PC-BASED ENODE PILOT APPLICATION and e-NODE for the more sophisticated addressing schemes/setup (only for setup)

* Note: Lighting keypads cannot be field programmed to become Motor keypads

Ordering Example:

BSKP-2110-L

Converging Systems Inc.

IBT-100™ Intelligent Bus Translator Specification Sheet
CS-Bus™ Serial Adapter (RS-232-C)

Cat. No. IBT-100

View

Description:
The Intelligent Bus Translator (IBT-100) is a robust, standalone serial interface converter/firewall for CS-Bus and other RS-485 devices. This ingenious device enables automation systems with RS-232-C capability the ability to control CS-Bus equipment (ILC-100 lighting control and IMC-100 motor/shading products) up to 4000' away. For the installer, the IBT-100 is the interface upgrade tool of choice for nearly all CS-Bus devices. Simply connect the adapter to your computer and then connect the device to virtually any CS-Bus controller, keypad, or accessory to upgrade or customer firmware within seconds.

Construction:
Small format self-contained adapter housed in a molded plastic enclosure can be hidden nearly anywhere. Static protection to 16kV. Integrated galvanic opto-isolation.

Electrical:
Self-powered from DC voltage available on standard CS-Bus and other RS-485 bus lines. DB9(f) connector (for serial), RJ-25 connector (for CS-Bus/ RS-485 inputs).
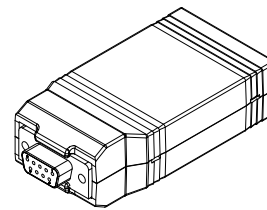
Mounting:
Typically plugs into DB9(m) port on RS-232-C equipment or to USB to RS-232-C adapters (i.e. Keyspan). Designed for dry locations.
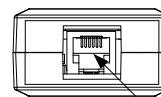
Applications
•Serial (RS-232-C) support for CS-Bus compatible Motor and Lighting Controllers •Extends range of serial devices from 50' to 4000'

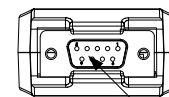| Pin	Signal
1	-
2	Transmit
3	Receive
4	-
5	Ground
6	-
7	-
8	-
9	-

Connectors

RJ25
CS-Bus

DB9 (F)
CPU or Data
Terminal

CS-Bus

Terminal
Equipment
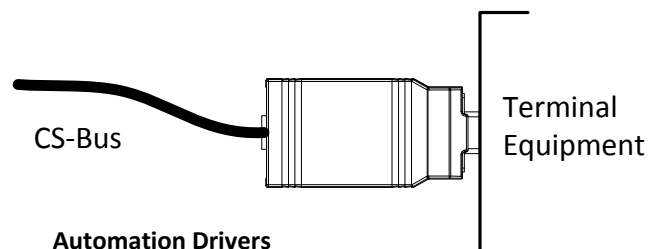
IBT-100 Specification	
Control Type:	RS-233C (DB-9)
Bus Output:	CS-Bus
Modes:	Serial, PROG
Max/CS-Bus Length:	4000' (1219m)
Max/RS-232 Length:	50' (15.24m)
Voltage:	5v to 15v DC
Current:	250ma
Warranty:	1yr

Compatible CS-Bus Devices	
For FW Upgrades	**For Serial Cntl**
ILC-100	IMC-100C
IMC-100T	IMC-100T
IMC-100C	IRC-300
BSKP-Keypads	ILC-100
IBE-1000	
IBE-1200	
IBE-1600	

Automation Drivers
Crestron
AMX
Elan Home Systems
Control 4
Savant
URI
Vantage

Model No.	Options
IBT-100	N/A

Note: RS-232-C baud rate/parameters are field adjustable
Note: For third-party automation support, please consult vendors directly
Note: Support of non-CS-Bus devices requires factory drivers. Please consult factory for options.

Ordering Example:

IBT-100

e-Node Internet Protocol Adapter Specification Sheet
CS-Bus Internet Interface Adapter and Commissioning Tool

Date:

Type:

Cat. No. IQA-eNODE - _____ - _____

Description:
The e-Node is in intelligent Internet Protocol (IP) controller which is designed to enable wired or wireless (Ethernet) control of nearly a limitless range of facility automation clients/devices. Its factory defaults allow it to communicate and control a wide range of CS-Bus compatible motor and lighting control devices (i.e. IMC-100, ILC-100). In addition, any device that supports RS-232-C or RS-485 communication can be controlled as well with factory provided drivers. Built-in web-pages accessible through any browser, iPAD, smart PDA can be viewed to control supported equipment.

Construction:
This DIN-rail packaged small foot print device can be hidden nearly anywhere.

Electrical:
External UL-listed 12v DC power supply 250ma provides power. Standard CAT5 connects e-Node to PC, router or other Ethernet source. Maximum cable length 328' (100m). Maximum CS-Bus cable length 4000' (1219m).
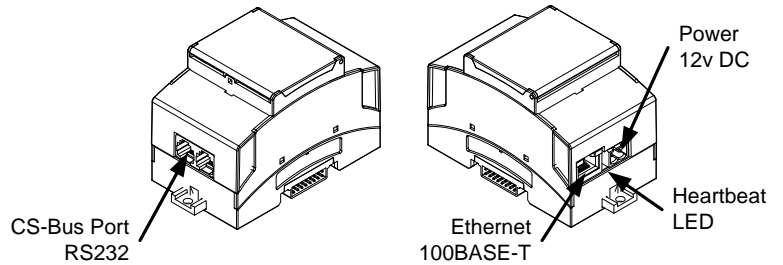
Mounting:
Mounts onto a standard 35-mm wide rail widely used to mount other DIN-rail products. Integrated spring clips can be also used to mount device to flat surface without DIN rail system. Designed for dry locations.
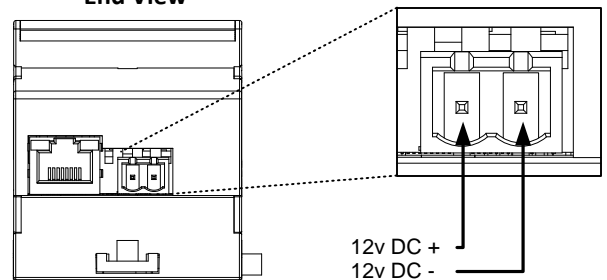
Applications
•Ethernet Support for CS-Bus Compatible Motor and Lighting Controller •Commissioning Tool for Easy-Setup of CS-Bus Devices.
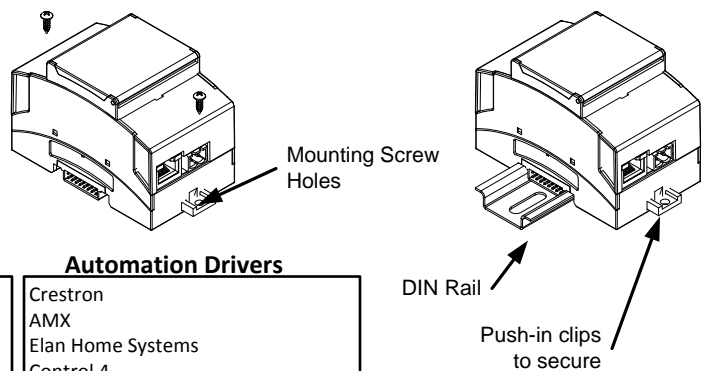
Connectors

CS-Bus Port RS232

Power 12v DC

Ethernet 100BASE-T

Heartbeat LED

End View

12v DC +
12v DC -

Mounting Detail

Mounting Screw Holes

DIN Rail

Push-in clips to secure

E-Node Specification

Control Type:	IP (RJ-45)
Bus Output:	CS-Bus, Serial
Web-Page Output:	Factory Config
Max. CS-Bus Lngt:	4000' (1219m)
Max RS-232 Lngt:	50' (15.24m)
Max.CS-Bus clients:	255
Pwr. Req't:	12v @250ma
Mounting:	DIN, screws
Warranty:	1yr

Protocols/Services

TCP	DNCP
UDP	NetBIOS
Telnet Client	SNTP
ARP	CGI
ICMP	XML Processor
DLC	AUTOIP
WINS	
Web Server	
HTTP / AJAX	

Automation Drivers

Crestron
AMX
Elan Home Systems
Control 4
Savant
URI
Lutron Grafix Eye
Lutron Grafix Eye QS
Ipod / Android with HTTP/AJAX

Model No.	Factory Default Bus Setup	Supplied PS
IQA-eNode	CS2 - Dual CS-Bus Architecture, RS2 - RS-232-C architecture, CC0 - Custom-Contact Factory	N-(None), 120-(120v AC input - 12v DC@250ma output), 220-(220-240v AC input - 12v DC@250ma output

REQUIRES PC BASED ENODE PILOT APPLICATION (INCLUDED) FOR CS-BUS DEVICE COMMISSIONING

Note: RS-232-C baud rate/parameters are field adjustable
Note: For third-party automation support, please consult vendors directly
Note: Support of non-CS-Bus devices requires factory drivers. Please consult factory for options.

Ordering Example:

IQA- eNode - CS2 - 120
Bus Setup   Supplied Power Supply

Converging Systems Inc.

FLLA LED Installation Instructions

1. Create a dry, flat, non-conductive platform to which the FLLA LED Strips will be mounted.

2. Install a UL-listed Class 2 power supply to provide either 12v DC or 24v DC (select the same output voltage for the power supply as the rated input voltage for the intended FLLA LED strip to be connected).

3. See the table below for the maximum run of a single (or wired in series) FLLA-24 or FLLA-12 volt LED array. In addition, find the maximum run of FLLA-12 or FLLA-24 strips that can be supported by a single UL-Listed Class 2 power supply. Follow these recommendations for sizing your particular job.

> Example: ***FLLA-12-SB arrays using UL Class 2 power supply***. Up to 30' of FLLA LED arrays can be connected to a single ILC-100. This run length would require two (2) Leader Cables, one for a 16.4' (5m) run and another for the remaining 13.6' (4.15) run
>
> ***FLLA-24-EB arrays using UL Class 2 power supply***. Up to 25' of FLLA LED arrays can be connected to a single ILC-100. This run length would require two (2) Leader Cables, one for a 16.4' (5m) run and another for the remaining 8.6' (2.62) run

ILC-100 Output Details per Type of LED Array

| Model	W/Ft.	Max run/ single leader wire	Max run/ single UL-Class 2 Power Supply	Max run/ single Higher wattage Power Supply*	Sample Possible runs with single UL-Class 2 PS	Sample Possible runs with higher wattage PS*
FLLA-12-SB	2w/ft.	16.4' (5m)	30' (9.14m)	40' (12.19m)	One 16.4' (5m) plus one 13.6' (4.15m)	Two 16.4' (5m) plus one 7.2' (2.19m)
FLLA-24-EB	4w/ft.	16.4' (5m)	25' (7.62m)	40' (12.19m)	One 16.4' (5m) plus one 8.6'(2.62m)	Two 16.4' (5m) plus one 7.2' (2.19m)

*Note: The Factory cannot recommend this case, however, facts are presented for completeness

4. Run the FLLA Leader Cable from the ILC-100 to the powered-end (male connector of the FLLA). If the above table indicates a second Leader Cable is required, run that second (or additional) Leader Cable back to the ILC-100. Should you wish to extend the distance between the ILC-100 and the powered-end of the FLLA, select appropriate hook-up wire (i.e. proper gauge with respect to length of run) as specified in the Voltage Drop Table. Pay particular attention to maintaining the proper polarity and pin-outs from the ILC-100 to the FLLA itself. Make sure that you connect the Common + (marked 12v+ or 24+ on the FLLA) to the same marked port on the ILC-100.

5. Mount the FLLA LED arrays to the selected surface. Use either the built-in 3M adhesive on the bottom of the strips by peeling off the protective covering or use silicon straps (FLLA-SILSTPS-KIT).

Instructions for Field Cutting FLLA LED Strips

If you determine that the lengths of the FLLA LED strips that you ordered are too long, it is preferable to return them to the factory and reorder the correct length so that you do not compromise the product warranty. If time is a problem and if you are willing to impact the warranty, you may field cut the FLLA LED strips in the following manner. Make sure the power to the FLLA LED strips is disconnected before proceeding:

1. ***FLLA-12-SB Strips.*** These strips may be cut at 3.93"(0.10m) at the white line. When measuring from the end, you will find a set of eight solder points. Using a sharp tool, cut exactly between the eight pads, leaving four on either side of the cut.

2. ***FLLA-24-EB Strips.*** These strips may be cut at 1.99" (0.05m) at the white line. When measuring from the end, you will find a set of eight solder points. Using a sharp tool, cut exactly between the eight pads, leaving four on either side of the cut.

3. Seal the end of the flexible array using Silicone Conformal Coating.
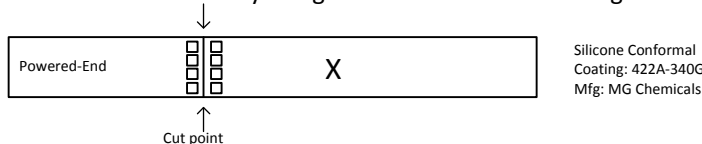
4. The section remaining after the cut (marked by X) may be salvaged depending upon the type LFFA LED array used (Dry-type only). If you are proficient at soldering, you can order male solder-on pins (FLLA-SLDONFL-4P-M) as well as female solder-on sockets (FLLA-SLDONFL-4P-F) which are designed to perfectly replicate the factory male and female connections. If the printed circuit board is thoroughly cleaned at the solder points, these connectors can be installed easily.

Please note: The factory warranty is void on field reworks.

1. FLLA LED Arrays by definition are flexible in construction. The DRY versions are much less tolerant of sharper bends as compared with the DAMP version. However, it should be noted that the FLLA strips can not be bent in sharp angles. See the examples below:

2. FLLA strips can be ordered in a wide variety of lengths. You should develop accurate drawings in advance of your order or plan on having some back-up mixed lengths in stock for contingency purposes.

3. For sharp corners, it is often best to run the first strip to near the end of the initial dimension and use a flexible interconnect cable to connect to another FLLA strip that would begin a new run on the new dimension. See the diagram below for clarification
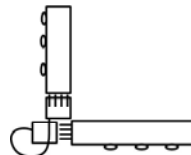
Flexible Interconnect Cable
PN: FLLA-IC-13

4. In some cases, it will be impossible to exactly fill a targeted dimension with FLLA strips even with the small lengths available from the factory. Several options exist here for optimizing the installation.

   - Option A is to double-up one strip above another for a short distance (see Option "A" below).
   - Option B is to cut the strip at a cut-line (see notes under "Instructions for Field Cutting FLLA LED Strips").
   - Option C is to "cheat" and under-run a specific FLLA strip in an area where the lack of illumination may not be too noticeable (see Option "C" below).
   - Option D is to run dual Leader cables in lieu of interconnecting two adjacent FLLA strips (see Option "D" below).
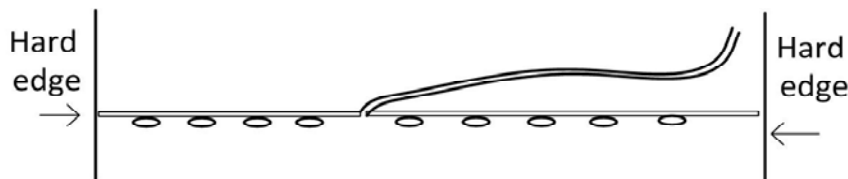
Option "A"- double up

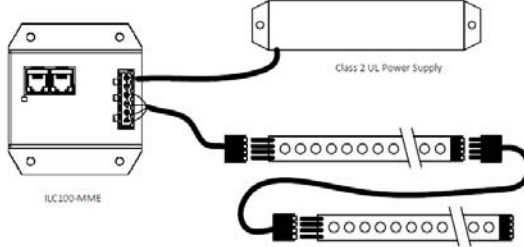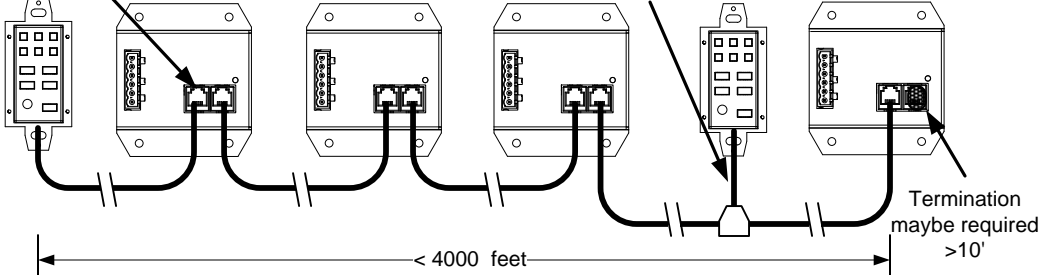Flexible Interconnect Cable
PN: FLLA-IC-13
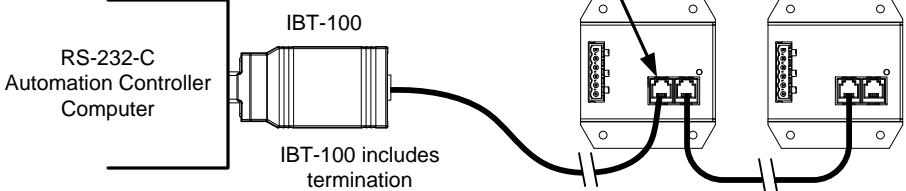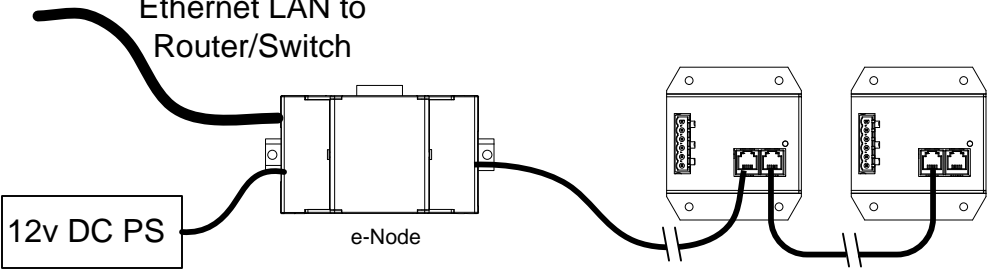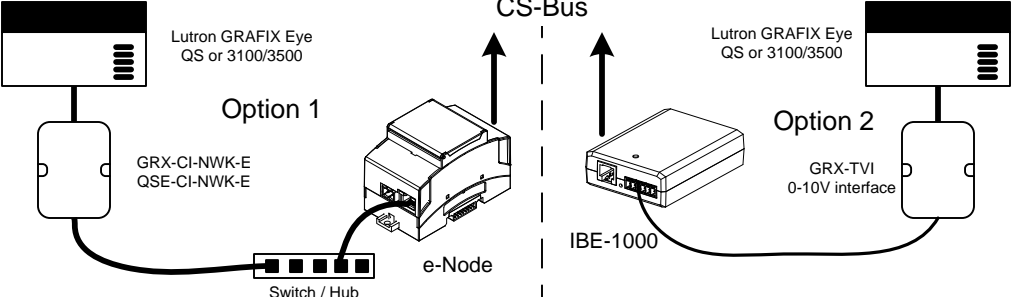
Option "C"- un-run a strip
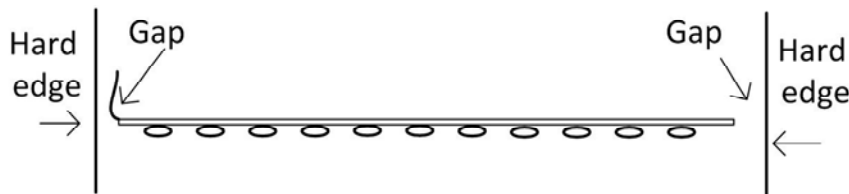
Leader Cable 5.91" (15cm)
PN: FLLA-LC-15

Option "D"- dual Leader Cables

Two (2) Leader Cable 5.91" (15cm)
PN: FLLA-LC-15

The various images below indicate the general type of wiring required for FLLA LED Arrays.

Power connections Single ILC-100 system	Single ILC-100 driving two FLLA strips in series
CS-Bus wiring Total length must be less than 4000 ft. Any stub lines must be less than 12 inches. Any lengths over 10 ft. may require termination. Termination should be used in electrical noisy installations. Keypad includes termination.	
CS-Bus Communication Wiring RS-232-c Baud rate : 57600 Bits : 8 Parity : None Stop bits : 1	
CS-Bus Communication Wiring-Ethernet	
CS-Bus Communication Wiring-Lutron Grafix Eye/ QS Option1: Multiple zones using e-Node (no Lutron load zone required). Option 2: Simple single zone using IBE-1000 (single Lutron load zone required).	

The chart below can be used to maintain the proper voltage to your FLLA LED lighting element. These tables assume no more than a 6% voltage drop (0.72 volts for 12 volts or 1.44 volts for 24 volts) for full light output.

Interconnect Distance from ILC-100 to FLLA LED (meters)

FLLA Length (meters)

22 SWG

20 SWG

18 SWG

16 SWG

14 SWG