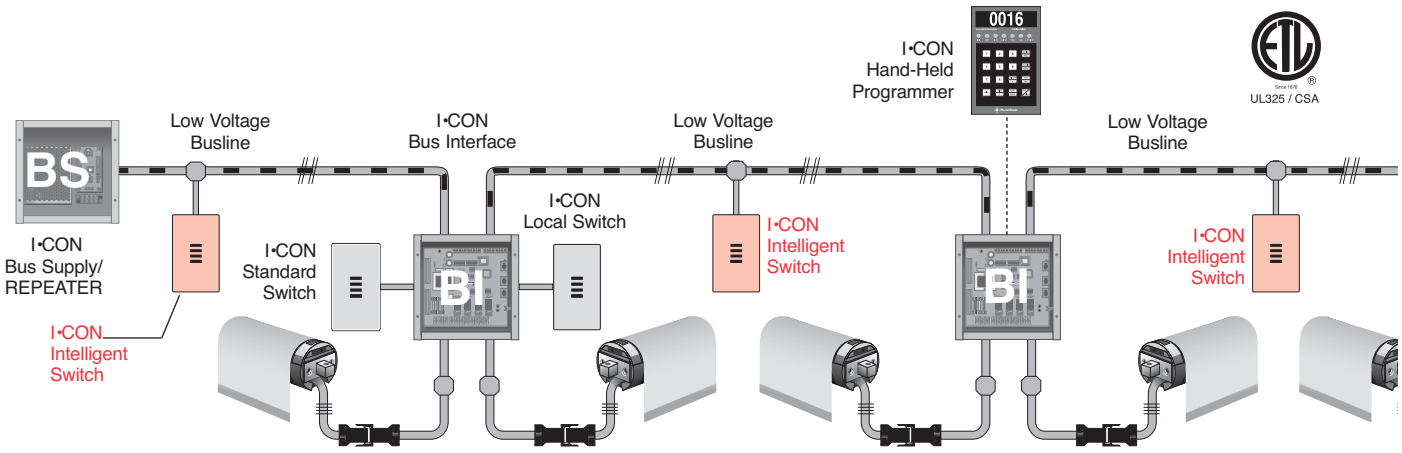
Networked: Low Voltage Controls – I•CON™

I•CON

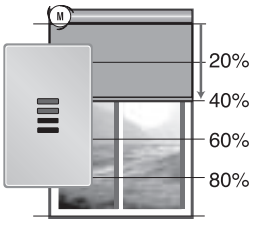
Addressable Local and Wide Zone Switching on a bus.



The fully addressable MechoShade's® Intelligent Motor Control System™ (I•CON™) is a 2-way communicating softwar busline control system that is ideal for medium, large and complex networks. The major advantages of the I•CON system are wiring simplicity, exceptional flexibility and lower installation costs, making I•CON the ideal solution for base building and multitenant Class A office building projects where floor layouts frequently change. Also, Audio/ Visual centers and/or conference rooms with movable walls resulting constant changes in shade configuration.

The I•CON features:

- Expandable/Scalable system employs 2-way, low voltage communication network capable of building-wide applications.
- "Out -Of-The-Box" configuration.
- Free Topology wiring allows low voltage connections to be run in the most cost-efficient manner (daisy-chain, star/home run, loop, etc.).
- Two forms of addressing – DIP Switch or software
- Program/Re-program Motor grouping without rewiring or "Climbing the ladder".
  - DIP switch addressing available for installation without manual programming tools or PC.
  - Handheld Programmer enables convenient programming of motor groups from 1 location without accessing each controller.
- Multi-Level Overlapping Control (individual / group / master control)
  - Each motor can be part of up to 9 different control groups.
  - Simplified wiring: communication network requires only 1 connection per controller regardless of how many control groups are implemented.
- Open architecture allows access via dry-contact control.
- Local control network enables cost effective local control through dry contact inputs without separate device.
  - Integrates controllers with 3rd party controllers without adding components.
  - Allows 3rd party switches to control shades while keeping a consistent user interface with lights and other systems.
- Six (6) Alignment Positions.
  - Four (4) programmable mid-window alignment positions which default to 20% / 40% / 60% / 80%.
- Two Modes of Shade Operation: Normal and UniformMode™.
- Integrates with Lighting, HVAC, A/V and BMS.
  - Dry contact integration through local control network
  - LonWorks integration through communications network
  - AAC/PC for building-wide SolarTrac Applications



Auto Set Positions

Continued ☞

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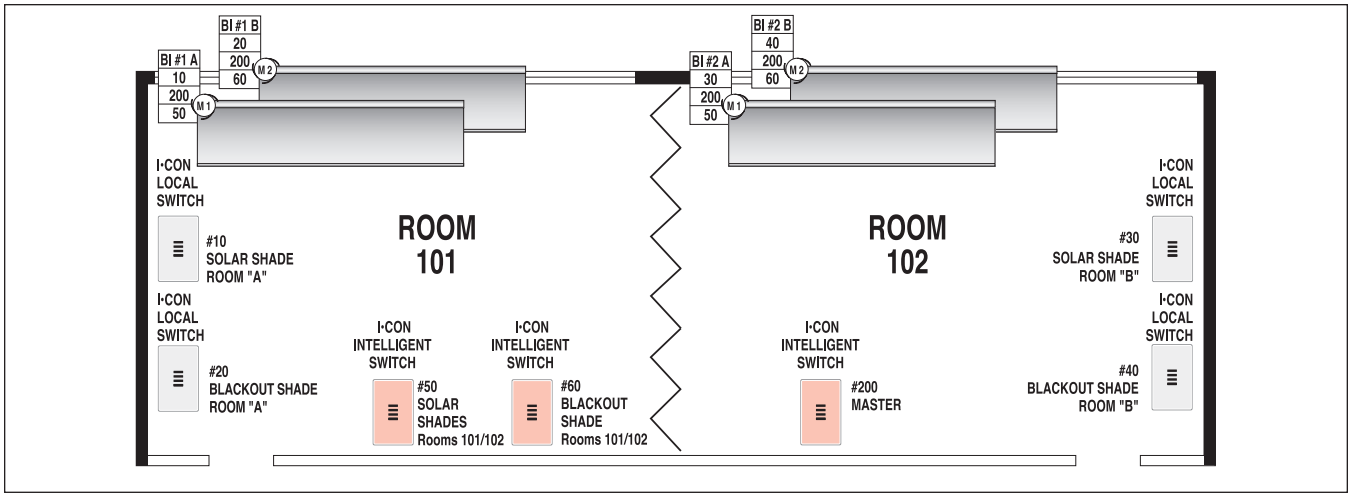
I•CON



Multi-Level Control

The I•CON Control System consists of standard, open source line voltage motors connected to addressable, 2-motor I•CON Bus Interface Controllers (BI).

- Each I•CON network can support 255 unique addresses.
- If more than 255 addresses are required, the network can be extended.
- Through the BI each motor can respond to up to 9-unique addresses thus enabling a motor to be part of 8 different group addresses and yet still be individually addressed.
- Control wiring is simple, flexible and independent of addressing scheme unlike hardwired systems.
- Control wiring links every BI together into the network using 2 twisted pair, low voltage cabling or standard CAT5 cabling.
- Control network wiring is a free topology.

Addressing

Within the I•CON BI each motor can be addressed and controlled through up to 9 different addresses:

1) 8 - Software Programmable Network Addresses
2) 1 - Local Port DIP Switch Address (DSA)

Devices on the network (ie. Intelligent Switches) can control a motor through any one of its internal 9 addresses. Devices on a BI's Local Port can control the motor they are directly wired to plus any motors which have a Programmable or DSA address coinciding with the DIP switch address of the Local Port that the Local Switch is connected to.

Local Port Addressing - Local Switch Control:

Each I•CON BI has 2 local switch ports - one for each of the motors the BI controls. The I•CON Local Switch and Port allows one to pre-set a simple network in the factory, yet provide flexibility for changes and modifications in the field without reprogramming, while maintaining the key features of the I•CON system.

The I•CON Local Switch and Local Switch Port have the following features/functionality:

- I•CON Local Switches plug into one of 2 port on a BI, and directly control one of the corresponding motors without any addressing or programming.
- The I•CON Local Switch's control can be expanded to control other motors on the network by setting a DIP switch address on the Local Switch Port that the I•CON Local Switch is connected to.
- Any motor on the network with an address that corresponds with the DIP switch address will respond to the Local Switch.
- Preset DIP Switch Addressing provides out of the box group control functionality, avoiding field commissioning and programming.
- The I•CON Local Switch provides 6 alignment positions, including full up, full down and 4 default intermediate positions of 20%, 40%, 60% and 80%.
- Up to 4, custom intermediate alignment positions can be easily be set by the user or installer.

Network Addressing – Intelligent Switch Control

I•CON Intelligent Switches provide maximum flexibility in wiring, control and access to the I•CON network. I•CON Intelligent Switches share the same 4 button architecture as the I•CON Standard Switch, but have additional intelligence built into a circuit board on the back of the switch. I•CON Intelligent Switch features and functions include:

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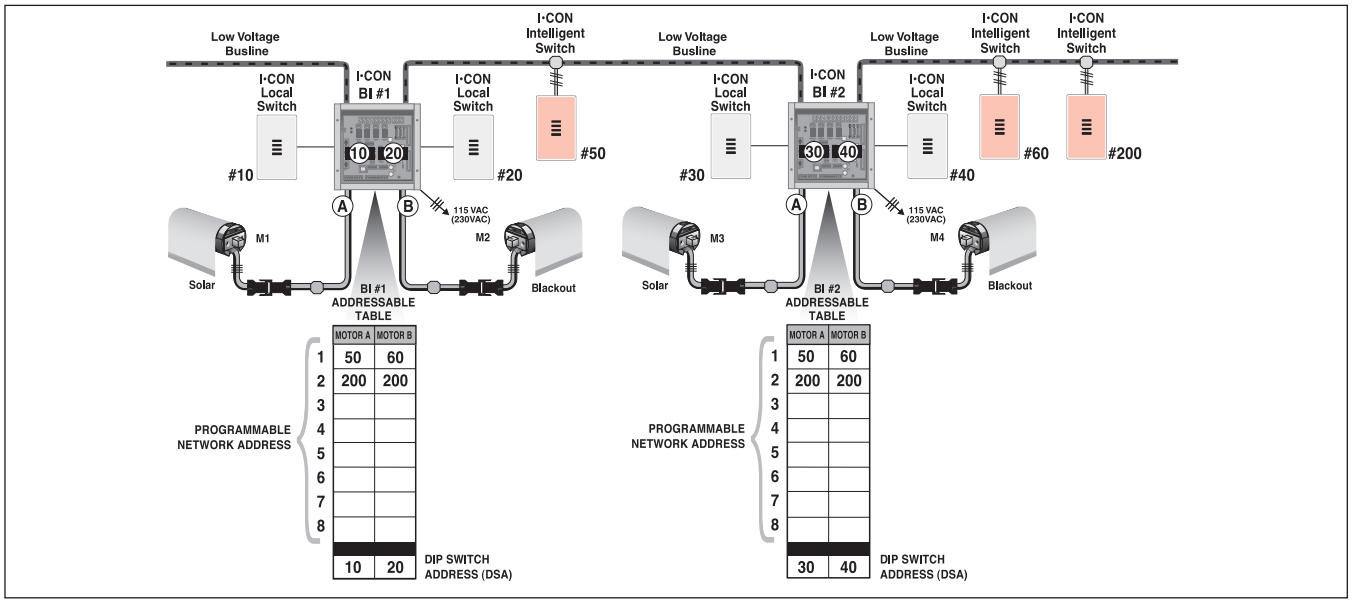

- I•CON Intelligent Switches can be wired anywhere on the I•CON network and are not limited to connection to a BI, providing flexibility, convenience and lower wiring costs.
- I•CON Intelligent Switches can control motors anywhere on the network, regardless of physical location.
- A software based address is programmed into an I•CON Intelligent Switch: Any motor on the network with a corresponding address in their address table can respond to that switch.
- Ideal for master control and large or overlapping group control applications spanning multiple offices or floors.
- Ideal for environments where switches and controls may require reconfiguration.
- The I•CON Intelligent Switch provides access to the network for a Hand held I•CON programmer which allows access to any motor/ BI on the network for programming and commissioning.
- Features an elegant 4-button architecture by which to access all functions.
- Provides 6 alignment positions, including full up, full down and 4 default intermediate positions of 20%, 40%, 60% and 80%.
- Up to 4 custom intermediate alignment positions can be easily be set by the user or installer.
- Local Switch Port on the BI allows access to 3rd party control ie. A/V, Lighting and BMS, via dry contacts.

Six Position Mid-Window Alignment

I•CON automatically aligns two or more motorized shades at auto set or custom set positions on a window. Each switch positions shades to 6 aligned positions. Using a four button switch, shades may be positioned and aligned at four intermediate set points (20%, 40%, 60% & 80% of the window height or custom programmed at any point on the window as specified by the owner/architect). Plus full up and full down. Shades always align at the selected stop points top down or bottom up thus compensating for variances due to gravity. *(See illustration on page 4.38.)*

UniformMode™ and Normal Mode

UniformMode™: Shades may ONLY be stopped at any of the 6 alignment positions. Normal Mode: Shades may be stopped at any of the 6 alignment positions (Up, 20%, 40%, 60%,80%, Down) or anywhere in between.

With I•CON, even though the motors are asynchronous and the grouped shades are of different size width and weight, shade bands can be programmed to align at selected points on the window.

Third Party Integration

The Local Switch Port extends the integration and operation of the I•CON control network beyond Local Switches to third party control systems (Lighting, A/V, HVAC and BMS). The use of the dip switch addresses allows the Local Switch Port to broadcast the shad commands, from a third party system,

Continued ☞

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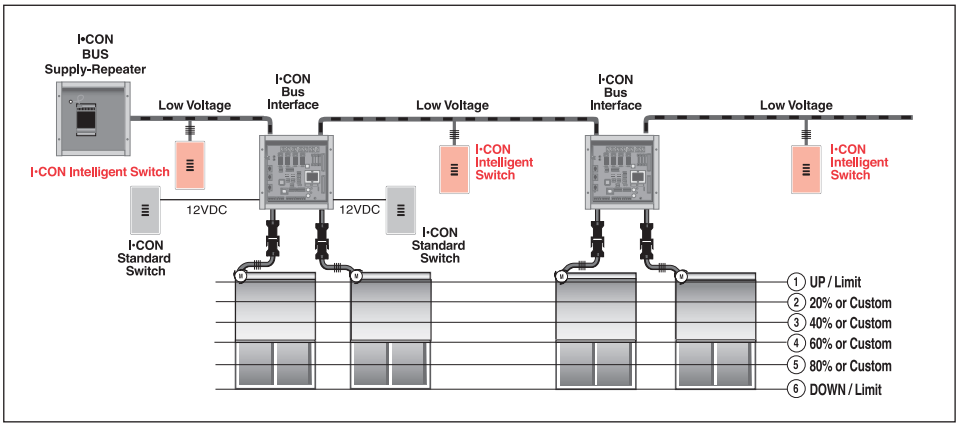
Networked: Low Voltage Controls – I•CON™: Features

throughout the network. Unlike many competing systems, the Local Switch Port provides dry contact integration without requiring the costly expense of adding an interface module (ie. dry contact interface, RS232 Interface). Thus, the Local Switch Port can provide a cost effective and universal method to extend control of the shading network to other systems within the building.



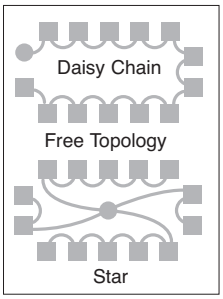
I•CON can also utilize a variety of interface modules to integrate with third party control systems through the network using RS232, RS485 and a various other protocols and media.

Installation

I•CON represents a networked shading control system which employs a single ubiquitous low voltage cable network to interconnect controllers (BIs) and switches in order to form control groups Network wiring.

- Eliminates the labor intensive “spider web” of connections found in a hardwired system where each switch must be wired directly to the controller for each motor that it controls.
- Greatly reduces the troubleshooting costs associated with complex groupings.

I•CON utilizes a free topology network to interconnect controllers (BIs), switches, and other network devices. Whether someone is homerunning cables back out a central panel or daisy chaining out to each successive devise, I•CON can meet the installation’s requirements to support cost minimization, quick installation, ease of troubleshooting and/or future expansion flexibility. Free topology supports any combination of star, bus and loop wiring structures even within the same installation. This simplifies installation by allowing the wiring to be run in the most expeditious manner. It also simplifies expansion by eliminating restrictions on wiring routing, splicing and network devise placement. Simplicity is the rule and problems due to field wiring errors are substantially reduced. While net difference in cost is minimal (the increased cost of the hardware being offset by the reduced cost of wiring) the net advantage in operation reliability and management flexibility is substantial.



Fully accessible, fully addressable and easily programmed / reprogrammed.

Each two motor BI has its own unique four digit location number for ease of locating and programming. Each of the two motors are managed by the BI through various address tables. Each side has:

1 BI Dip Switch Address (BI/DSA). Manually set.

8 Programmable Network Addresses (ISA). Set via the hand-held programmer.

The I•CON hand-held Programmer allows access and programming of any BI of Intelligent Switch from any location on the network. Thus the system can be reconfigured without rewiring.

Switch reconfiguration instead of rewiring

Each Switch and Bus Interface may be reprogrammed on site via the hand-held I•CON Programmer resulting in a system that can be reconfigured without rewiring. Additional Switches may be wired in series or in parallel.

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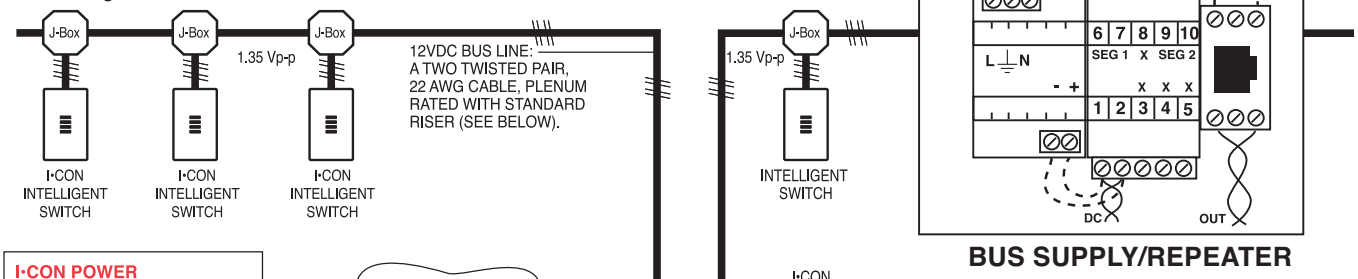
Networked: Low Voltage Control – I·CON™ Wiring Diagram

Low voltage Standard and Intelligent Switching over a two-way communication busline for two motors.

For a network using only Local Switches the Bus Supply is not required. Intelligent Switch and Bus Supply is required when a motor is controlled by more than one address. However, the twisted pair bus line control wires are required in all network types. A Bus Supply and/or Repeater is required for networks greater than 62 nodes.



BUS SUPPLY/REPEATER

I·CON POWER REQUIREMENT:

INPUT

LINE VOLTAGE INPUT:
120 VAC, 50/60 HZ, ±10%
240 VAC, 50/60 HZ,± 10%

LOW VOLTAGE INPUT:
12 VDC, 10MA PER INPUT

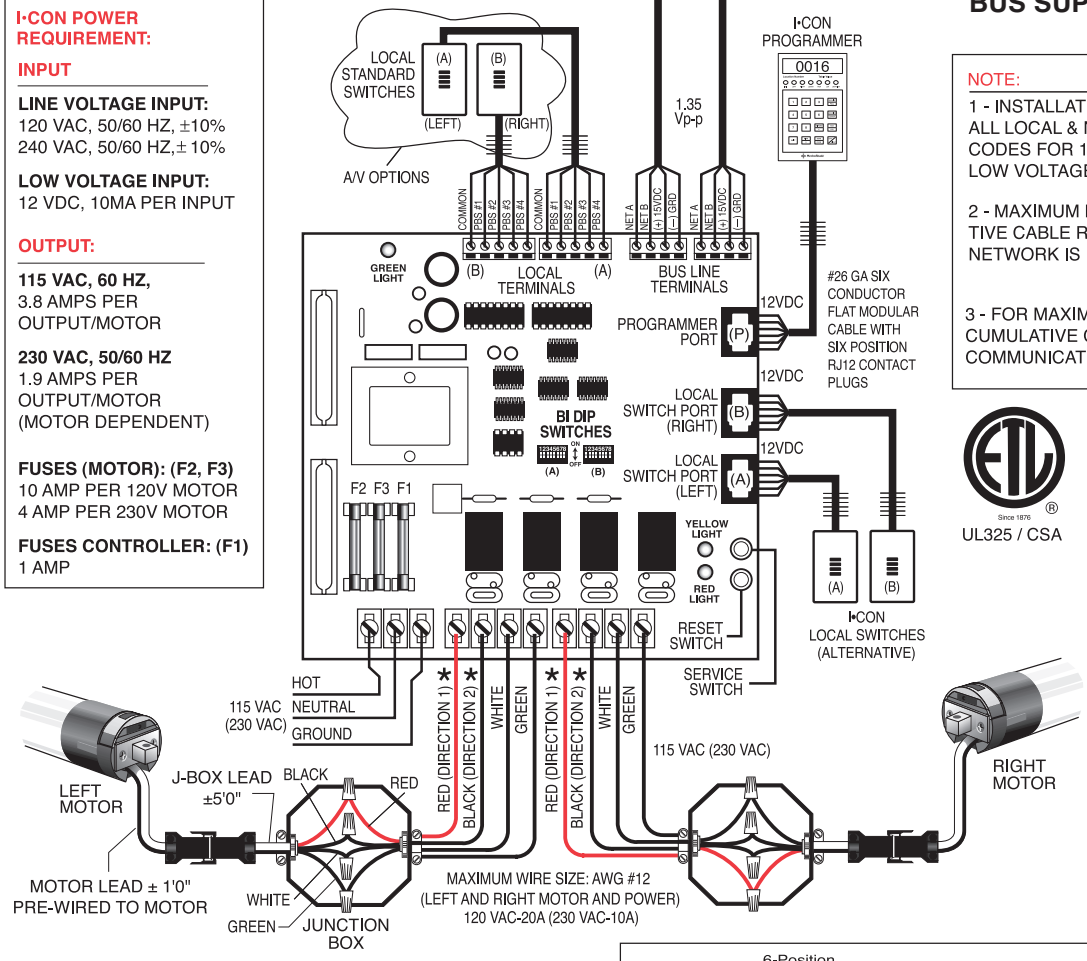
OUTPUT:

115 VAC, 60 HZ,
3.8 AMPS PER
OUTPUT/MOTOR

230 VAC, 50/60 HZ
1.9 AMPS PER
OUTPUT/MOTOR
(MOTOR DEPENDENT)

FUSES (MOTOR): (F2, F3)
10 AMP PER 120V MOTOR
4 AMP PER 230V MOTOR

FUSES CONTROLLER: (F1)
1 AMP



NOTE:

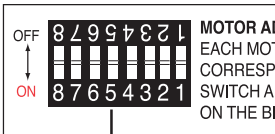
1 - INSTALLATION MUST COMPLY WITH ALL LOCAL & NATIONAL ELECTRICAL CODES FOR 115 VAC (230 VAC) AND LOW VOLTAGE WIRING REQUIREMENTS

2 - MAXIMUM LOW VOLTAGE CUMULATIVE CABLE RUN FOR LOCAL CONTROL NETWORK IS 400 FEET (133m)

3 - FOR MAXIMUM LOW VOLTAGE CUMULATIVE CABLE RUN FOR COMMUNICATION NETWORK:

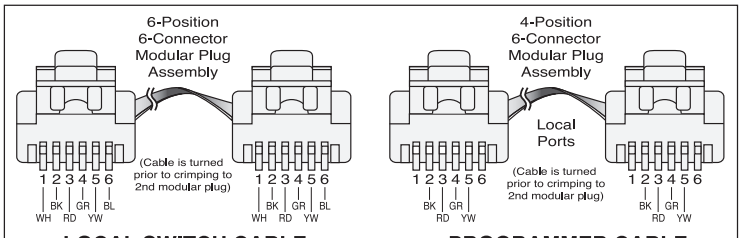
UL325 / CSA

Note: Drawings are incomplete unless both pages of this Wiring Diagram, 4.39 – 4.40, plus the Electrical Notes pages 4.49 – 4.51 are included.



MOTOR ADDRESSING:
EACH MOTOR HAS A DIP SWITCH ADDRESS WHICH CORRESPONDS TO ANY SOFTWARE OR INTELLIGENT SWITCH ADDRESS. IT IS ENTERED IN BINARY FORMAT ON THE BI AND THE INTELLIGENT SWITCH.

87654321
00000001 BINARY = 1 DECIMAL
00001000 BINARY = 8 DECIMAL
10000000 BINARY = 255 DECIMAL



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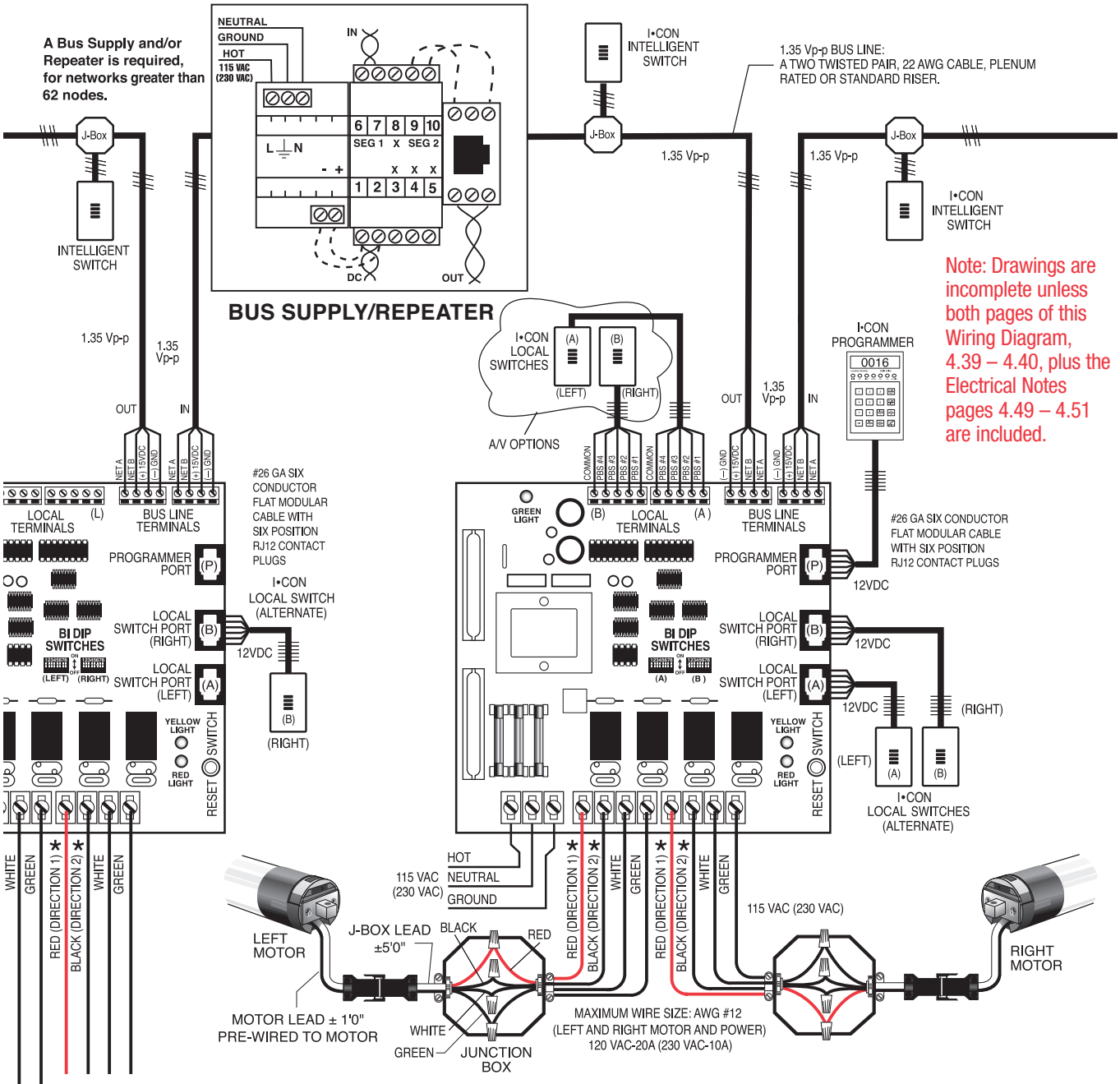
Networked: Low Voltage Control – I•CON™ Wiring Diagram

How to connect two or more I•CON Bus Interfaces and three or more motors to a bus line.



NOTE

The black and red motor lead wiring shown is for Direction 1:
- Right-Hand Drive Regular-Roll
- Left-Hand Drive Reverse-Roll

Reverse the black and red motor lead wiring for Direction 2:
- Left-Hand Drive Regular-Roll
- Right-Hand Drive Reverse-Roll

See ✱ indications below each Black and Red motor terminal.

Node-Node Spacing	Total Wire Length	P/N 2 Twisted Pair	Plan(P) / Non(N)	Strand (ST) / Solid (SO)
LOCAL SWITCH	400 ft.	Olympic Cable 3746-26	N	ST
1200 ft.	1500 ft.	Great Lakes Wire & Cable #70003	P	SO
1200 ft.	1500 ft.	ConnectAir #W222P-2003	P	ST
750 ft.	**1350 ft.**	**TIA568A CAT 5**	**P/N**	**ST/SO**

THE PROGRAMMABLE/SOFTWARE ADDRESSES, AND BI LOCATION ADDRESSES ARE PROGRAMMED USING THE HAND-HELD I•CON PROGRAMMER OR VIA A PC.

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