USER MANUAL

Power Brick LV-IMS SLSA

Power Brick LV-IMS

PBL8-xxx-xxx-xxxxxxxAS3

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Copyright Information

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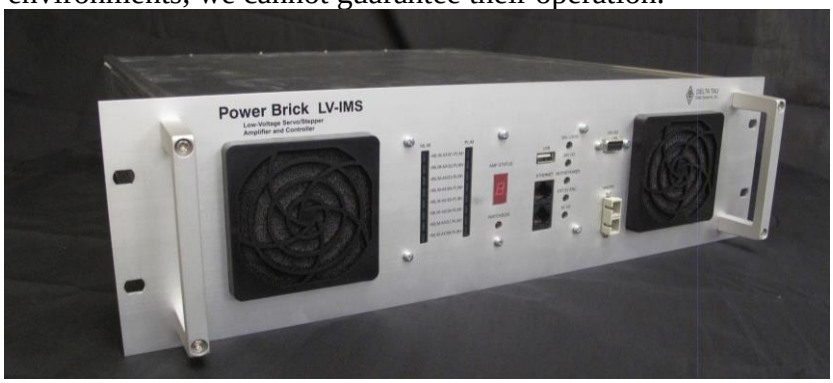
Operating Conditions

All Faraday Motion Controls UK Ltd. motion controller products, accessories, and amplifiers contain static sensitive components that can be damaged by incorrect handling. When installing or handling Faraday Motion Controls UK Ltd. products, avoid contact with highly insulated materials. Only qualified personnel should be allowed to handle this equipment.
In the case of industrial applications, we expect our products to be protected from hazardous or conductive materials and/or environments that could cause harm to the controller by damaging components or causing electrical shorts. When our products are used in an industrial environment, install them into an industrial electrical cabinet or industrial PC to protect them from excessive or corrosive moisture, abnormal ambient temperatures, and conductive materials. If Faraday Motion Controls UK Ltd. products are directly exposed to hazardous or conductive materials and/or environments, we cannot guarantee their operation.



Safety Instructions

Qualified personnel must transport, assemble, install, and maintain this equipment. Properly qualified personnel are persons who are familiar with the transport, assembly, installation, and operation of equipment. The qualified personnel must know and observe the following standards and regulations:

IEC 364 resp. CENELEC HD 384 or DIN VDE 0100
IEC report 664 or DIN VDE 0110
National regulations for safety and accident prevention or VBG 4

The following British standards also apply:

BS EN 954-1:1997 Safety of machinery. Safety related parts of control systems. General principles for design.

Incorrect handling of products can result in injury and damage to persons and machinery. Strictly adhere to the installation instructions. Electrical safety is provided through a low-resistance earth connection. It is vital to ensure that all system components are connected to earth ground.

This product contains components that are sensitive to static electricity and can be damaged by incorrect handling. Avoid contact with high insulating materials (artificial fabrics, plastic film, etc.). Place the product on a conductive surface. Discharge any possible static electricity build-up by touching an unpainted, metal, grounded surface before touching the equipment.

Keep all covers and cabinet doors shut during operation. Be aware that during operation, the product has electrically charged components and hot surfaces. Control and power cables can carry a high voltage, even when the motor is not rotating. Never disconnect or connect the product while the power source is energized to avoid electric arcing.

After removing the power source from the equipment, wait at least 10 minutes before touching or disconnecting sections of the equipment that normally carry electrical charges (e.g., capacitors, contacts, screw connections). To be safe, measure the electrical contact points with a meter before touching the equipment.

The following text formats are used in this manual to indicate a potential for personal injury or equipment damage. Read the safety notices in this manual before attempting installation, operation, or maintenance to avoid serious bodily injury, damage to the equipment, or operational difficulty.

WARNING:

A Warning identifies hazards that could result in personal injury or death. It precedes the discussion of interest.

Caution:

A Caution identifies hazards that could result in equipment damage. It precedes the discussion of interest.

Note:

A Note identifies information critical to the user's understanding or use of the equipment. It follows the discussion of interest.

REVISION HISTORY				
REV.	**DESCRIPTION**	**DATE**	**CHG**	**APPVD**
0.1	PRELIMINARY MANUAL CREATION	06/07/15	AJ	Tony Jacobs
1.0	Rev 1.0 RELEASED	01/01/19	AJ	Tony Jacobs

Table of Contents

INTRODUCTION

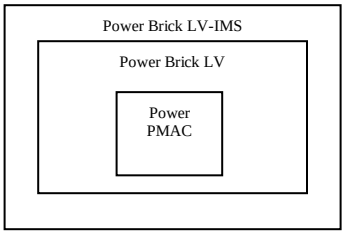
Philosophy of the Power Brick LV-IMS
The Power Brick LV-IMS is essentially a wrapper around the Power Brick LV product inserting it into a 19” 4U high rack mountable enclosure with specific connectivity.

The Power Brick LV-IMS consists of a Power PMAC section and Plant Interface Module or PIM
It is important to understand how the product is constructed so as to be able to select the correct hardware, firmware and software manuals. It is also important to understand the modular approach that Faraday Motion Controls adopts with it’s manuals.

Each product has a number of very specific manuals associated with the finished product and the Power Brick LV-IMS assembly is no exception. The following diagram aims to show what manuals are appropriate for the system as a whole.

Documentation

In conjunction with this hardware reference manual, the Power PMAC Software Reference Manual and Power PMAC User Manual and Power Brick LV HRM are essential for proper use, motor setup, and configuration of the Brick Controller IMS-II. It is highly recommended to always refer to the latest revision of the manuals found on Faraday Motion Controls’s website or Delta Taus web site,



Power PMAC

PPMAC Software Reference Manual

Power PMAC User Manual

Power Brick LV-IMS

Caution:

The connectivity shown in the Power Brick LV User Manual becomes internal when incorporated into the –IMS system. Non of the external connections for the –IMS are shown in the Power Brick LV User Manual..

Power Brick LV User Manual

Note:

It is highly recommended to refer to the latest revision of the manuals.
They can be found at: http://www.deltatau.com/fmenu/fmenu.htm

Environmental Specifications

Description	Specifications
Ambient operating Temperature Range (EN50178 Class 3K3 – IEC721-3-3)	Minimum operating temperature:……..…….0°C (32°F) Maximum operating temperature:……..…… 45°C (113°F)
Storage Temperature Range (EN 50178 Class 1K4 – IEC721-3-1/2)	Minimum Storage temperature:……-25°C (-13°F) Maximum Storage temperature:…..…….…… 70°C (158°F)
Humidity Characteristics (with no condensation and no formation of ice) (IEC721-3-3)	Minimum Relative Humidity:…….. 5% HU Maximum Relative Humidity up to 35°C (95°F):……...95% HU Maximum Relative Humidity from 35°C up to 50°C (122°F) :……..85% HU
De-rating for Altitude	0~1000m (0~3300ft):…….…… no modification 1000 ~3000m (3300~9840ft):……..-1%/m (-0.33%/ft) 3000 ~4000m (9840~13000ft):……..……..-2%/m (-0.67%/ft)
Environment (ISA 71-04)	For use in pollution degree 2 environments
Atmospheric Pressure (EN50178 class 2K3)	70KPa to 106 KPa
Shock	Unspecified
Vibration	Unspecified
Air Flow Clearances	Additional fans and clearances may be required when stacking units
Cooling	Fans situated on the front face of the unit should be kept clear
Standard IP Protection	IP20

Electrical Specifications

Description	Specifications
Logic Power Supply	Input Voltage:……..24Vdc Continuous Input Current:……..…….A (rms)
Number of Axes	4/8
Output	+/- 10V 16Bit or Pulse and Direction for use with external stepper drives

Recommended Fusing and Wire Gauge

Model	Recommended Fuse (FRN/LPN)	Recommended Wire Gauge*
4 axes		
8 axes		
* See local and national code requirements		

RECEIVING AND UNPACKING

Faraday Motion Controls products are thoroughly tested at the factory and carefully packaged for shipment. Upon receipt of hardware, please follow carefully the instructions below for proper maintenance and handling:

1. Observe the condition of the shipping container and report any damage immediately to the commercial carrier.
2. Remove the hardware from the shipping container and remove all packing materials. Check all shipping material for connector kits and documentation. Some components may be quite small and can be accidentally discarded if care is not used when unpacking the equipment. The container and packing materials may be retained for future shipment.
3. Verify that the part number of the unit received matches the part number listed on the purchase order.
4. Inspect the drive for external physical damage that may have been sustained during shipping and report damages immediately to the commercial carrier. Document any damage with photographs.
5. Electronic components in this unit are design-hardened to reduce static sensitivity. However, use proper procedures when handling the equipment to avoid electrostatic discharges (ESD).
6. If the Power Brick LV-IMS is to be stored for several weeks before integration (i.e., spare part), be sure that it is stored in a location that conforms to environmental specifications on page 5 of this manual. Also, testing of the unit is recommended before storing it for future use.

Use of Equipment

The following restrictions will ensure the proper use of the Power Brick LV-IMS:

- The components built into electrical equipment or machines can be used only as integral components of such equipment.
- The Power Brick LV-IMS must not be operated on power supply networks without a ground
- If the Power Brick LV-IMS is used in residential areas, or in business or commercial premises, implement additional filter measures.
- The Power Brick LV-IMS may be operated only in a closed switchgear cabinet, taking into account the ambient conditions defined in the environmental specifications.

Faraday Motion Controls guarantees the conformance of the Power Brick LV-IMS with the standards for industrial areas stated in this manual only if Faraday Motion Controls components (cables, accessories, etc.) are used.

Mounting

The controller placement in the machine cabinet is important. Installation should be in an area that is protected from direct sunlight, corrosives, harmful gases or liquids, dust, metallic particles, and other contaminants. Exposure to these conditions can reduce the operating life and degrade performance of the drive.

Several other factors should be carefully evaluated when selecting a location for installation:

- For effective cooling and maintenance, the control should be mounted in a suitable 19" rack system
- Top and bottom clearance must be provided for air flow.
- Temperature, humidity and Vibration specifications should also be taken into account.

It is extremely important that the airflow is not obstructed by the placement of conduit tracks or other devices in the enclosure.

Make sure that all metal chips are cleaned up before the drive is mounted so there is no risk of getting metal chips inside the drive.

Caution:

Units must be installed in an enclosure that meets the environmental IP rating of the end product (ventilation or cooling may be necessary to prevent enclosure ambient from exceeding 45° C [113° F]).

SYSTEM WIRING

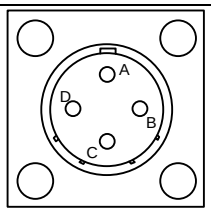
Installation of electrical control equipment is subject to many regulations including national, state, local, and industry guidelines and rules. General recommendations can be stated but it is important that the installation be carried out in accordance with all regulations pertaining to the installation.

WARNING

Connectors on Back Panel

5V DC EXT ENC Supply

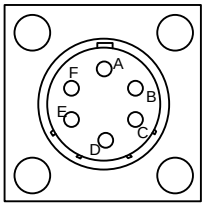
This connector is to provide the external 5 volts to the encoder power. In order to use it, it also requires changing the jumpers on 300-603946-10X board. Please see the jumper setting in this manual.

5V DC EXT Encoder Supply **(PN: UT00104PH Manufactured By SOURIAU)**			
Pin #	**Symbol**	**Function**	**Description**
A	5 V	Input	5 volts input power from Power Supply
B	N.C.		
C	0 V	Common	Common Ground
D	N.C.		

This is a list of mating connector and pin.

Part Number	**Manufacture**	**Description**
UT06104SH	SOURIAU	Circular Conn Plug, Size 10, 4 pos, cable
UT010JCS	SOURIAU	CABLE CLAMP, 10, BRASS
RC16M23K	SOURIAU	Crimp Socket, 20-16AWG

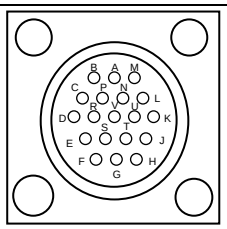
24V I/O and 24V Logic

24V I/O and 24V Logic Power Supply Input Connector **(PN: UT0W0106PH, Manufactured By SOURIAU)**			
Pin #	**Symbol**	**Function**	**Description**
A	24VLogic	Input	24 volts for Logic Power Input
B	0VLogic	Common	24 volts return for Logic Power
C	24VI/O	Input	24 volts for I/O Power Input
D	0VI/O	Common	24 volts return for I/O power.
E	N.C.		
F	N.C.		

This is a list of mating connector and pin.

Part Number	**Manufacture**	**Description**
UT06106SH	SOURIAU	Circular Conn Plug, Size 10, 6 pos, cable
UT010JCS	SOURIAU	CABLE CLAMP, 10, BRASS
RC18W3K	SOURIAU	CONTACT SOCKET, UT0W, 22-20AWG

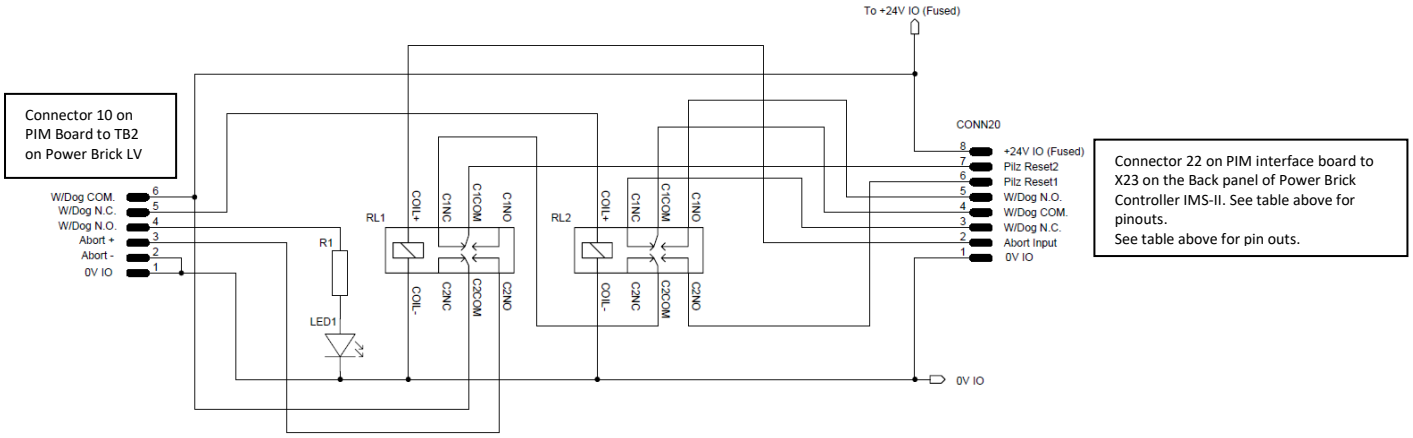
Watchdog & Abort I/P

Watchdog Abort I/P & STO Safe Torque Output **(PN: UT0W01419SH Manufactured By SOURIAU)**			
Pin #	**Symbol**	**Function**	**Description**
A	0V I/O	Common	Common return for 24V I/O
B	Abort	Input	Abort Input 24VDC reference to 0V I/O
C	WD N.C.	Output	Watchdog Relay (Open Contact in Normal Operation)*
D	WD Common	Common	Watchdog Common
E	WD N.O.	Output	Watchdog Relay (Closed Contact in Normal Operation)*
F	Pilz Reset1	I/O	When Abort Input is off, Pilz Reset1 to Pilz Reset2 are connected together. When Abort Input is on, Pilz Reset1 to Pilz Reset2 are not connected.
G	Pilz Reset2	I/O	
H	24V I/O	Output	24V Power Output.
J	N/C		
K	STO FB		
L	STO IN 1		
M	STO IN 2		
N	STO Disable		
P	STO Disable Return		
R	N/C		
S	N/C		
T	N/C		
U	24V		
V	24V		

* When the Power Brick LV-IMS is operating normally, the contact for WD N.C. is open, and the contact for WD N.O. is closed. When a watchdog condition occurs, the WD N.C. contact will be closed, and the WD N.O. contact will be open.

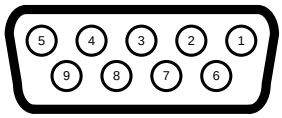
When Abort Input is off, Pilz Reset1 and Pilz Reset 2 are connected at normal condition. When Abort Input is On, Pilz Reset 1 and Pilz Reset 2 are not connected at normal condition. When PMAC gets watchdog, Pilz Reset 1 and Pilz Reset 2 are not connected in any conditions of Abort Input.

There is a schematic in below as a reference.

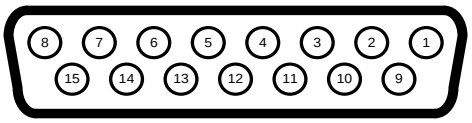


USER FLAGS

User Flag Input voltage is 24V.

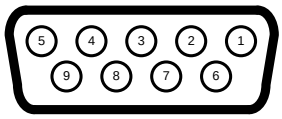
USER FLAGS D-sub 9 Female			
Pin #	**Symbol**	**Function**	**Description**
1	USER1	Input	User Flag Input for Channel 1
2	USER2	Input	User Flag Input for Channel 2
3	USER3	Input	User Flag Input for Channel 3
4	USER4	Input	User Flag Input for Channel 4
5	USER5	Input	User Flag Input for Channel 5
6	USER6	Input	User Flag Input for Channel 6
7	USER7	Input	User Flag Input for Channel 7
8	USER8	Input	User Flag Input for Channel 8
9	0VI/O	Common	Reference 0V I/O

ENCODER 1 – ENCODER 8:

ENCODER # **D-sub 15 Female**			
Pin #	**Symbol**	**Function**	**Description**
1	CHU/DIR+	Input/Output	Hall Effect U / Stepper Direction+ output for PFM mode / Data-
2	GND	Common	0V of 24V and 5V Common Ground
3	CHV/DIR-	Input/Output	Hall Effect V / Stepper Direction- output for PFM mode / CLK+
4	CHC-	Input	Encoder C-
5	CHB-	Input	Encoder B-
6	CHA-	Input	Encoder A-
7	Encoder Pwr	Output	Encoder Power 5VDC
8	Encoder Pwr	Output	Encoder Power 5VDC
9	GND	Common	0V of 24V and 5V Common Ground
10	CHT/PUL-	Input/Output	Hall Effect T / Stepper Pulse- output for PFM mode / Data +
11	CHW/PUL+	Input/Output	Hall Effect W /Stepper Pulse+ output for PFM mode / CLK-
12	CHC+	Input	Encoder C+
13	CHB+	Input	Encoder B+
14	CHA+	Input	Encoder A+
15	GND	Common	0V of 24V and 5V Common Ground

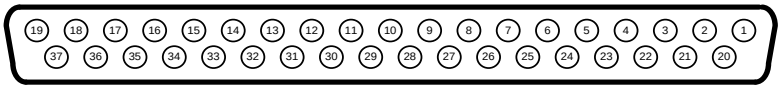
EQU

All EQU outputs is TTL 5V.

EQU **D-sub 9 Female**			
Pin #	**Symbol**	**Function**	**Description**
1	EQU5	output	EQU output for Channel 5
2	EQU6	output	EQU output for Channel 6
3	EQU7	output	EQU output for Channel 7
4	EQU8	output	EQU output for Channel 8
5	EQU1	output	EQU output for Channel 1
6	EQU2	output	EQU output for Channel 2
7	EQU3	output	EQU output for Channel 3
8	EQU4	output	EQU output for Channel 4
9	0VI/O	Common	Reference 0V I/O

GPIO

GPIO working voltage is 12-24V. It is configurable to work either sourcing or sinking output/input by hardware wiring.

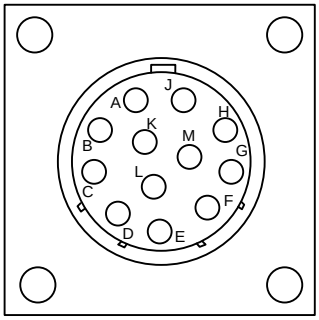
GPIO D-sub 37 Female			
Pin #	**Symbol**	**Function**	**Description**
1	GPI1	Input	Input 1
2	GPI3	Input	Input 3
3	GPI5	Input	Input 5
4	GPI7	Input	Input 7
5	GPI9	Input	Input 9
6	GPI11	Input	Input 11
7	GPI13	Input	Input 13
8	GPI15	Input	Input 15
9	IN COM 1-8	Common	Input 1 to 8 common
10	N.C.		Not Connected
11	COM-EMT	Input	Common Emitter
12	GPO1-	Output	Sourcing Output 1
13	GPO2-	Output	Sourcing Output 2
14	GPO3-	Output	Sourcing Output 3
15	GPO4-	Output	Sourcing Output 4
16	GPO5-	Output	Sourcing Output 5
17	GPO6-	Output	Sourcing Output 6
18	GPO7-	Output	Sourcing Output 7
19	GPO8-	Output	Sourcing Output 8
20	GPI2	Input	Input 2
21	GPI4	Input	Input 4
22	GPI6	Input	Input 6
23	GPI8	Input	Input 8
24	GPI10	Input	Input 10
25	GPI12	Input	Input 12
26	GPI14	Input	Input 14
27	GPI16	Input	Input 16
28	IN_COM9-16	Common	Input 9 to 16 common
29	COM_COL	Input	Common Collector
30	GPO1+	Output	Sinking Output 1
31	GPO2+	Output	Sinking Output 2
32	GPO3+	Output	Sinking Output 3
33	GPO4+	Output	Sinking Output 4
34	GPO5+	Output	Sinking Output 5
35	GPO6+	Output	Sinking Output 6
36	GPO7+	Output	Sinking Output 7
37	GPO8+	Output	Sinking Output 8

Note:

- ✓ All General Purpose I/Os are optically isolated.

- ✓ The Inputs are 12-24V, and can be wired as sinking or sourcing.
- ✓ The Outputs are 24V nominal, 0.5A maximum current overload protected.
- ✓ For Sinking Outputs, connect the COM_EMT (pin11) line to the Analog Ground of the power supply and the outputs to the individual plus output lines, e.g. GPO1+
- ✓ For Sourcing Outputs, connect the COM_COL (pin29) line to 12-24V and the outputs to the individual minus output lines, e.g., GPO1-
- ✓ Do not mix topologies, i.e., all sinking or all sourcing outputs. If the common emitter is used, the common collector should not be connected and vice versa.

AMP1 – AMP 8

AMP # **(PN: UT001412SH Manufactured By SOURIAU)**			
Pin #	**Symbol**	**Function**	**Description**
A	Motor GND	Common	Common
B	PHASE U	Output	Motor Phase U Output
C	PHASE W	Output	Motor Phase W Output
D	PHASE V	Output	Motor Phase V Output
E	PHASE X	Output	Motor Phase X Output
F	SHIELD	Common	Cable Shield
G	PLIM	Input	Positive Limit Input
H	HOME	Input	Home Flag Input
J	MLIM	Input	Negative Limit Input
K	5V	Output	5V power supply for Flag/Limits
L	24V	Output	24V power supply for Flag/Limits
M	0V	Common	0V power supply for Flag/Limits

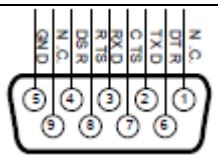
This is a list of mating connector and pin.

Part Number	**Manufacture**	**Description**
UT061412PH	SOURIAU	CIRCULAR CONN PLUG SIZE 14, 12POS, CABLE
UT014JCS	SOURIAU	CABLE CLAMP, 14, BRASS
RM16M23K	SOURIAU	CRIMP PIN, 20-16AWG

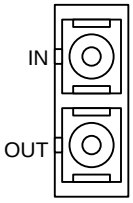
Connectors on Front Panel

RS232(Front Panel

This port can be used as a primary communication mean or employed as a secondary port that allows simultaneous communication.

RS232			
Pin #	**Symbol**	**Function**	**Description**
1	N.C.		
2	TXD	Output	Receive Data
3	RXD	Input	Send Data
4	DSR	Bi-directional	Data set ready
5	GND	Common	Common Ground
6	DTR	Bi-directional	Data term ready
7	CTR	Input	Clear to send
8	RTS	Output	Request to send
9	N.C.		

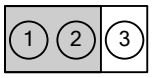
MACRO (Available for Enhanced Unit) Front Panel

MACRO SC-Style Fiber Connector		
Pin #	Symbol	Function
1	IN	MACRO Ring Receiver
2	OUT	MACRO Ring Transmitter
The fiber optic version of MACRO uses 62.5/125 multi-mode glass fiber optic cable terminated in an SC-style connector. The optical wavelength is 1,300 nm.		

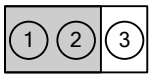
APPENDIX A: E-POINT JUMPERS

E-Point Jumper Description for PIM-II Board DT-P26-PCB-001-xx

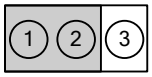
Encoder Power Selection for Encoder 1

E-Point	Description	Default
LK67 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

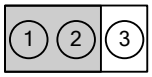
Encoder Power Selection for Encoder 2

E-Point	Description	Default
LK71 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

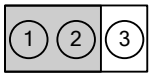
Encoder Power Selection for Encoder 3

E-Point	Description	Default
LK75 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

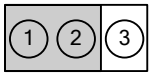
Encoder Power Selection for Encoder 4

E-Point	Description	Default
LK79 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

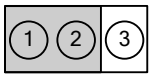
Encoder Power Selection for Encoder 5

E-Point	Description	Default
LK65 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

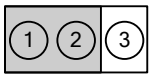
Encoder Power Selection for Encoder 6

E-Point	Description	Default
LK69 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

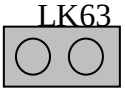
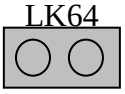
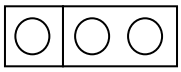
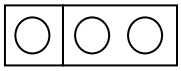
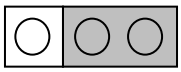
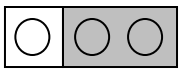
Encoder Power Selection for Encoder 7

E-Point	Description	Default
LK73 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

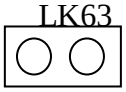
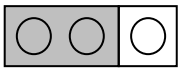
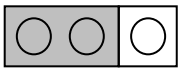
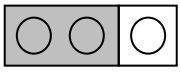
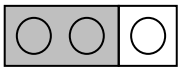
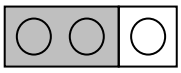
Encoder Power Selection for Encoder 8

E-Point	Description	Default
LK77 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

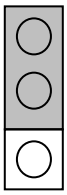
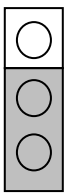
24V Flag Input Voltage Selection for Ch1

E-Point	Description	Default
LK63  LK64 	Install Link 63 and Link 64 for 24 Volt operation	24V operation is the default configuration
LK58 	Remove Links 58 and 59	
LK59 		
LK60 	Install links 60, 61 & 62 in the “park” position	
LK61 		
LK62 		

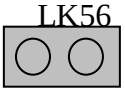
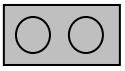
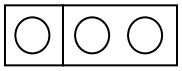
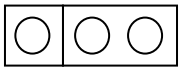
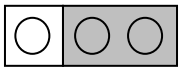
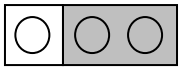
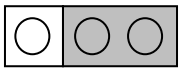
5V Flag Input Voltage Selection for Ch1

E-Point	Description	Default
LK63  LK64  LK58  LK59  LK60  LK61  LK62 	Remove Links 63 and Link 64 for 5 Volt operation install Links 58, 59, 60, 61 & 62	

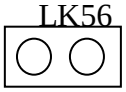
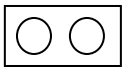
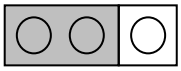
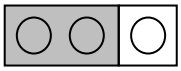
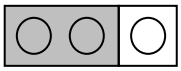
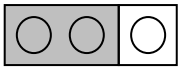
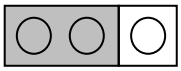
Sink or Source Selection for Ch1

E-Point	Description	Default
LK29  	Link as shown for Source (printed on PCB) Link as shown for Sink (printed on PCB)	Default

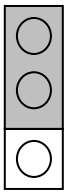
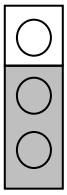
24V Flag Input Voltage Selection for Ch2

E-Point	Description	Default
LK56  LK57  LK51  LK52  LK53  LK54  LK55 	Install Link 56 and Link 57 for 24 Volt operation Remove Links 51 and 52 Install links 53, 54 & 55 in the “park” position	24V operation is the default configuration

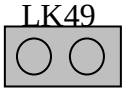
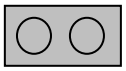
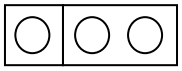
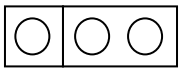
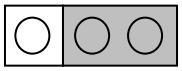
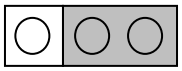
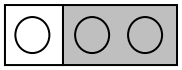
5V Flag Input Voltage Selection for Ch2

E-Point	Description	Default
LK56  LK57  LK51  LK52  LK53  LK54  LK55 	Remove Links 56 and Link 57 for 5 Volt operation install Links 51, 52, 53, 54 & 55	

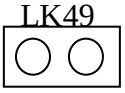
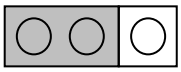
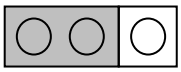
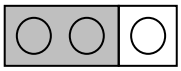
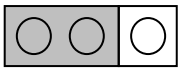
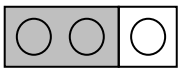
Sink or Source Selection for Ch2

E-Point	Description	Default
LK28 	Link as shown for Source (printed on PCB)	Default
	Link as shown for Sink (printed on PCB)	

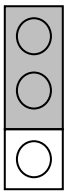
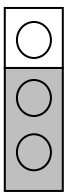
24V Flag Input Voltage Selection for Ch3

E-Point	Description	Default
LK49  LK50  LK44  LK45  LK46  LK47  LK48 	Install Link 49 and Link 50 for 24 Volt operation Remove Links 44 and 45 Install links 46, 47 & 48 in the “park” position	24V operation is the default configuration

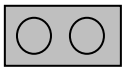
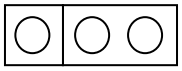
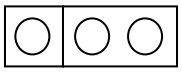
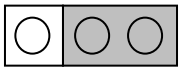
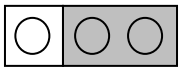
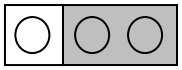
5V Flag Input Voltage Selection for Ch3

E-Point	Description	Default
LK49  LK50  LK44  LK45  LK46  LK47  LK48 	Remove Links 49 and Link 50 for 5 Volt operation install Links 44, 45, 46, 47 & 48	

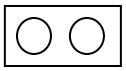
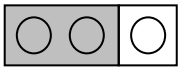
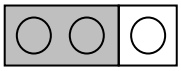
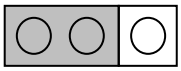
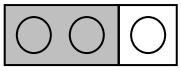
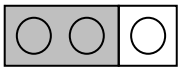
Sink or Source Selection for Ch3

E-Point	Description	Default
LK20 	**Link as shown for Source (printed on PCB)**	**Default**
	**Link as shown for Sink (printed on PCB)**	

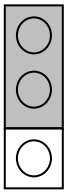
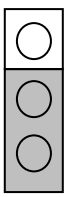
24V Flag Input Voltage Selection for Ch4

E-Point	Description	Default
LK42  LK43 	Install Link 42 and Link 43 for 24 Volt operation	24V operation is the default configuration
LK37  LK38 	Remove Links 37 and 38	
LK39  LK40  LK41 	Install links 39, 40& 41 in the “park” position	

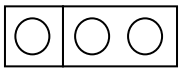
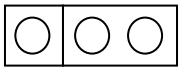
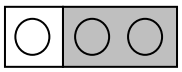
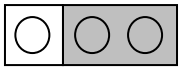
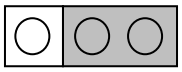
5V Flag Input Voltage Selection for Ch4

E-Point	Description	Default
LK42  LK43  LK37  LK38  LK39  LK40  LK41 	Remove Links 42 and Link 43 for 5 Volt operation install Links 37, 38, 39, 40 & 41	

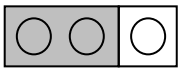
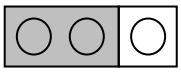
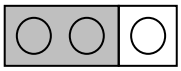
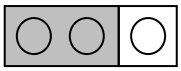
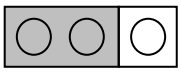
Sink or Source Selection for Ch4

E-Point	Description	Default
LK19  	**Link as shown for Source (printed on PCB)** **Link as shown for Sink (printed on PCB)**	**Default**

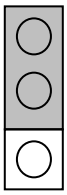
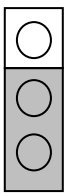
24V Limit Input Voltage Selection for Ch5

E-Point	Description	Default
LK35  LK36  LK30  LK31  LK32  LK33  LK34 	Install Link 35 and Link 36 for 24 Volt operation Remove Links 30 and 31 Install links 32, 33 & 34 in the “park” position	24V operation is the default configuration

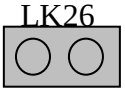
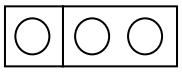
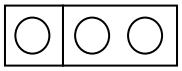
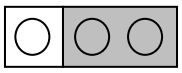
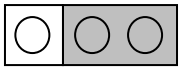
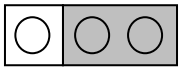
5V Flag Input Voltage Selection for Ch5

E-Point	Description	Default
LK35  LK36  LK30  LK31  LK32  LK33  LK34 	Remove Links 35 and Link 36 for 5 Volt operation install Links 30, 31, 32, 33 & 34	

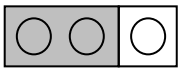
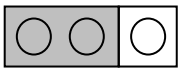
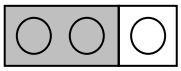
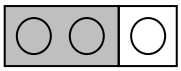
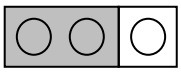
Sink or Source Selection for Ch5

E-Point	Description	Default
LK11  	**Link as shown for Source (printed on PCB)** **Link as shown for Sink (printed on PCB)**	**Default**

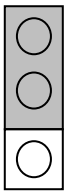
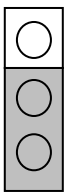
24V Flag Input Voltage Selection for Ch6

E-Point	Description	Default
LK26 	Install Link 26 and Link 27 for 24 Volt operation	24V operation is the default configuration
LK27 		
LK21 	Remove Links 21 and 22	
LK22 		
LK23 	Install links 23, 24 & 25 in the “park” position	
LK24 		
LK25 		

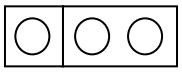
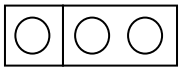
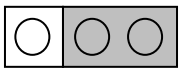
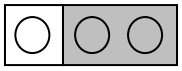
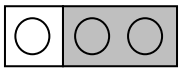
5V Flag Input Voltage Selection for Ch6

E-Point	Description	Default
LK26  LK27  LK21  LK22  LK23  LK24  LK25 	Remove Links 26 and Link 27 for 5 Volt operation install Links 21, 22, 23, 24 & 25	

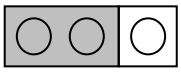
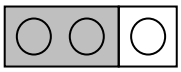
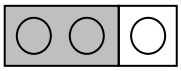
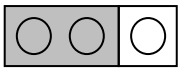
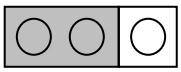
Sink or Source Selection for Ch6

E-Point	Description	Default
LK10  	Link as shown for Source (printed on PCB) Link as shown for Sink (printed on PCB)	Default

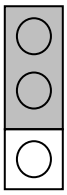
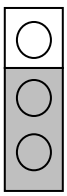
24V Flag Input Voltage Selection for Ch7

E-Point	Description	Default
LK17 	Install Link 17 and Link 18 for 24 Volt operation	24V operation is the default configuration
LK18 		
LK12 	Remove Links 12 and 13	
LK13 		
LK14 	Install links 14, 15 & 16 in the “park” position	
LK15 		
LK16 		

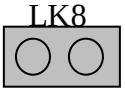
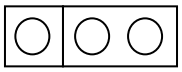
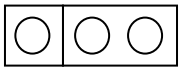
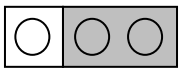
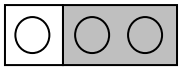
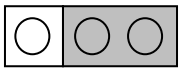
5V Flag Input Voltage Selection for Ch7

E-Point	Description	Default
LK17  LK18  LK12  LK13  LK14  LK15  LK16 	Remove Links 17and Link 18 for 5 Volt operation install Links 12, 13, 14, 15 &16	

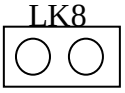
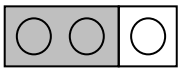
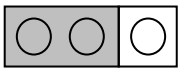
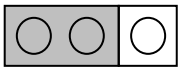
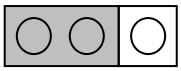
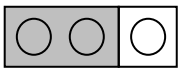
Sink or Source Selection for Ch7

E-Point	Description	Default
LK2  	Link as shown for Source (printed on PCB) Link as shown for Sink (printed on PCB)	Default

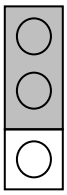
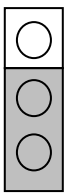
24V Flag Input Voltage Selection for Ch8

E-Point	Description	Default
LK8  LK9  LK3  LK4  LK5  LK6  LK7 	Install Link 8 and Link 9 for 24 Volt operation Remove Links 3 and 4 Install links 5, 6 & 7 in the “park” position	24V operation is the default configuration

5V Flag Input Voltage Selection for Ch8

E-Point	Description	Default
LK8  LK9  LK3  LK4  LK5  LK6  LK7 	Remove Links 8 and Link 9 for 5 Volt operation install Links 3, 4, 5, 6 &7	

Sink or Source Selection for Ch8

E-Point	Description	Default
LK1  	Link as shown for Source (printed on PCB) Link as shown for Sink (printed on PCB)	Default

5V & 24V I/O Fuses

These fuses are 2A Anti-Surge