USER MANUAL

Geo Brick LV
NSLS II

Geo Brick LV NSLS II

BH08-C0-442-000xxxxxx

July 11, 2011

DELTA TAU
Data Systems, Inc.
NEW IDEAS IN MOTION ...

Single Source Machine Control *Power // Flexibility // Ease of Use*
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Operating Conditions
All Delta Tau Data Systems, Inc. motion controller products, accessories, and amplifiers contain static sensitive components that can be damaged by incorrect handling. When installing or handling Delta Tau Data Systems, Inc. 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 Delta Tau Data Systems, Inc. products are directly exposed to hazardous or conductive materials and/or environments, we cannot guarantee their operation.

REVISION HISTORY				
REV.	**DESCRIPTION**	**DATE**	**CHANGED BY**	**APPROVED BY**
--	Initial Release	07/11/2011	Toru Sarumaru	Sina Sattari
A	correct typo, modify jumper settings, describe watch dog	07/18/2011	Toru Sarumaru	Sina Sattari
B	Correct Watchdog relay description, and add DB 37 GPIO connector detail.	07/25/2011	Toru Sarumaru	Sina Sattari
C	Modify Amp1-8 pin out description	01/09/2012	Toru Sarumaru	Sina Sattari

Table of Contents

Introduction

The Geo Brick **L**ow **V**oltage, 12~60V(DC) bus power input, combines the intelligence and capability of the Turbo PMAC2 motion controller with the latest MOSFET technology, resulting in a compact 4 or 8- axis smart servo package. The flexibility of the Turbo PMAC2 enables the Geo Brick LV to drive Stepper, Brush, or Brushless motors with unsurpassed pure digital DSP performance.

The Geo Brick LV also features a wide variety of options varying from processor speeds as high as 240MHz, multiple digital and analog inputs/outputs, USB2.0, Ethernet 100 Base T, serial communication, and Fieldbus connectivity to virtually accepting any type of encoder feedback.

Documentation

In conjunction with this hardware reference manual, the Turbo Software Reference Manual and Turbo PMAC User Manual and Geo Brick LV are essential for proper use, motor setup, and configuration of the Geo Brick LV. It is highly recommended to always refer to the latest revision of the manuals found on Delta Tau's website, under Support>documentation>Manuals: Delta Tau Manuals Link

System Wiring

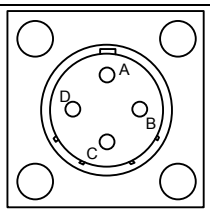
WARNING

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.

Connectors on Back Panel

5V DC EXT ENC Supply

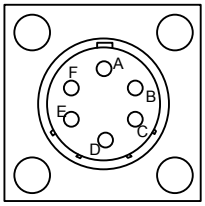
This connector is to provide the external 5 volts to the encoder power. In order to use it, it also requires changing the jumpers on 300-603946-10X board. Please see the jumper setting in this manual.

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

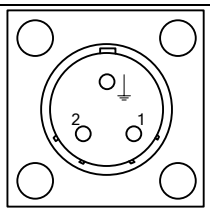
24V I/O and 24V Logic

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

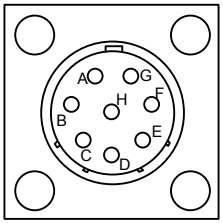
48V Motor

48V Motor			
Pin #	**Symbol**	**Function**	**Description**
1	48V	Input	48 volts for Bus Input Power
2	0V	Common	48 volts return
⏚	GND	Common	Chassis Ground

This is a list of mating connector and pin.

Part Number	**Manufacture**	**Description**
UT06103SH	SOURIAU	Circular Conn Plug, Size 10, 3 pos, cable
UT010JCS	SOURIAU	CABLE CLAMP, 10, BRASS
RC14M30K	SOURIAU	CONTACT, FEMALE, AWG16-14

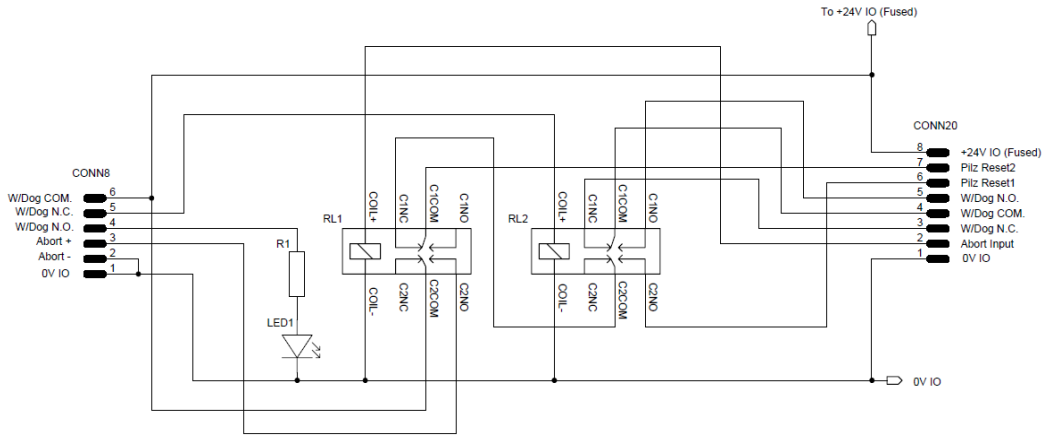
Watchdog & Abort I/P

Watchdog & Abort I/P **(PN: UT00128SH 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.

* When the Geo Brick LV 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.

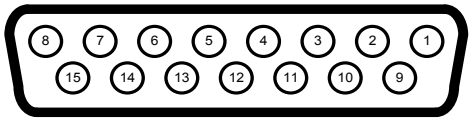
There is a schematic in below as a reference.



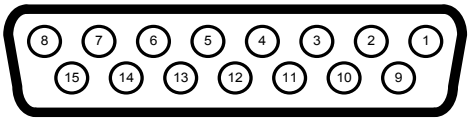
This is a list of mating connector and pin.

Part Number	Manufacture	Description
UT06128SH	SOURIAU	CIRCULAR CONN PLUG, SIZE 12, 8POS, CABLE
UT014JCS	SOURIAU	CABLE CLAMP, 14, BRASS
RM20M13K	SOURIAU	CONTACT, MALE

ENCODER 1 – ENCODER 8: Digital A Quad B

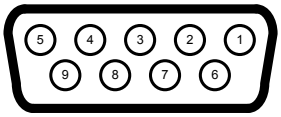
ENCODER # **D-sub 15 Female**			
Pin #	**Symbol**	**Function**	**Description**
1	CHA+	Input	Encoder A+
2	CHA-	Input	Encoder A-
3	CHB+	Input	Encoder B+
4	CHB-	Input	Encoder B-
5	CHC+	Input	Encoder Index+
6	CHC-	Input	Encoder Index-
7	Encoder Pwr	Output	Encoder Power 5VDC
8	GND	Common	Common Ground
9	CHU/DIR+	Input/Output	Hall Effect U / Direction+ output for PFM mode
10	CHV/DIR-	Input/Output	Hall Effect V / Direction- output for PFM mode
11	CHW/PUL+	Input/Output	Hall Effect W /Pulse+ output for PFM mode
12	CHT/PUL-	Input/Output	Hall Effect T / Pulse- output for PFM mode
13			Not used
14	Encoder Pwr	Input	Encoder Power 5VDC
15	GND	Common	Common Ground

ENCODER 1 – ENCODER 8: SSI (Available for Enhanced Unit)

ENCODER # **D-sub 15 Female**			
Pin #	**Symbol**	**Function**	**Description**
1			Not used for SSI Feedback
2			Not used for SSI Feedback
3			Not used for SSI Feedback
4			Not used for SSI Feedback
5			Not used for SSI Feedback
6			Not used for SSI Feedback
7	Encoder PWR	Output	Encoder Power 5VDC
8	0V	Common	Common Ground
9	DATA-	Input	Data- Packet
10	CLOCK+	Output	Serial Encoder Clock+
11	CLOCK-	Output	Serial Encoder Clock-
12	DATA+	Input	Data+ Packet
13			Not used for SSI Feedback
14	Encoder PWR	Output	Encoder Power 5VDC
15	0V	Common	Common Ground

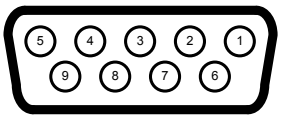
USER FLAGS

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

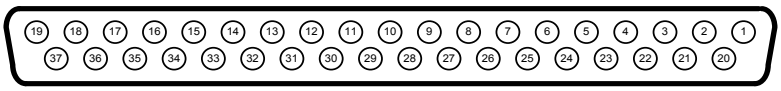
EQU

All EQU outputs is TTL 5V.

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

GPIO

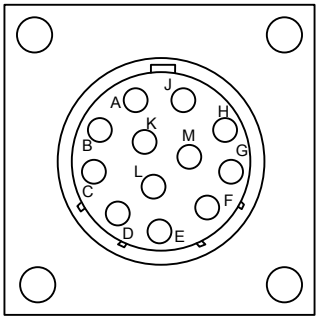
GPIO working voltage is 12-24V. It is configurable to work either sourcing or sinking output/input by hardware wiring.

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 ourcing.
- ✓ 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.

AMP 1 – AMP 8

AMP # **(PN: UT001412SH Manufactured By SOURIAU)**			
Pin #	**Symbol**	**Function**	**Description**
A	Motor GND	Common	Common
B	PHASE A+	Output	Motor Phase A+ Output for Stepper Motor (1)
C	PHASE A-	Output	Motor Phase A- Output for Stepper Motor (2)
D	PHASE B+	Output	Motor Phase B+ Output for Stepper Motor (3)
E	PHASE B-	Output	Motor Phase B- Output for Stepper Motor (4)
F	SHIELD	Common	Cable Shield
G	PLIM	Input	Positive Limit Input
H	MLIM	Input	Negative Limit Input
J	HOME	Input	Home Flag 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

NOTE:

(1) Motor Phase U for 3-phase Blushless Motor
(2) Motor Phase W for 3-phase Blushless Motor
(3) Motor Phase V for 3-phase Blushless Motor
(4) Not used for 3-phase Blushless Motor

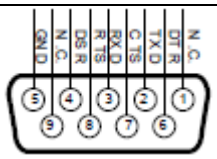
This is a list of mating connector and pin.

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

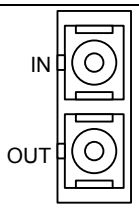
Connectors on Front Panel

RS232

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)

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.		

Reset & Bootstrap Switch

Reset Switch

When this switch is on at power up, Geo Brick LV is going to re-initialize.

Bootstrap Switch

When this switch is on at power up, geo Brick LV is now bootstrap mode. The user is able to download PMAC Firmware.

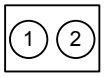
When this switch is on and hold at the normal operating condition, the user can change the IP address for Ethernet communication. There are two ways to change the IP address. The one way is to connect USB cable to the unit and open "Configure Ethernet 100 BaseT", which is coming with PMAC Executive Pro2 Suite. The user can change to the desired IP address. After change it, press "Store IP" button, and then click "Done" button.

Another way is to Open PMAC Executive Pro2 and open PCOMM server. Select Ethernet communication, and then click "Properties…" button. Click "General" button, and then change the IP address.

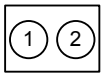
Appendix A: E-Point Jumpers

E-Point Jumper Description for Geo Brick LV Controller (603793)

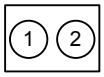
E0: Reset Control

E-Point	Description	Default
E0 	Factory use only; the board will not operate with E0 installed.	No Jumper

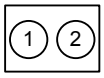
E1: Card0 Select

E-Point	Description	Default
E1 	Remove jumper to specify that this PMAC is Card 0, which generates its own phase and servo clock (default). Jump pins 1 to 2 to specify that this PMAC is not Card 0, but Card 1 to F (15), which requires external phase and servo clock signals from the serial port to operate.	No Jumper

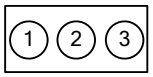
E2: (Reserved For Future Use)

E-Point	Description	Default
E2 	Factory Use Only	No Jumper

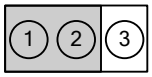
E4: (Reserved For Future Use)

E-Point	Description	Default
E4 	Factory Use Only	No Jumper

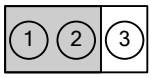
E5: (Reserved For Future Use)

E-Point	Description	Default
E5 	Factory Use Only	No Jumper

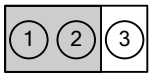
E6: AENA5 Source Selection on J15

E-Point	Description	Default
E6 	1-2 to set AENA5 on J15 connector from GPIO 2-3 to set AENA5 on J15 connector from AENA5	1-2

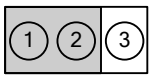
E7: AENA6 Source Selection on J15A

E-Point	Description	Default
E7 	1-2 to set AENA6 on J15A connector from GPIO 2-3 to set AENA6 on J15A connector from AENA6	1-2

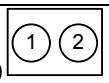
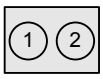
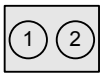
E8: AENA7 Source Selection on J16

E-Point	Description	Default
E8 	1-2 to set AENA7 on J16 connector from GPIO 2-3 to set AENA7 on J16 connector from AENA3	1-2

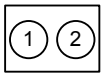
E9: AENA8 Source Selection on J16A

E-Point	Description	Default
E9 	1-2 to set AENA8 on J16A connector from GPIO 2-3 to set AENA8 on J16A connector from AENA4	1-2

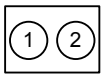
E10, E11 & E12: CPU Configuration

E-Point	Description	Default
E10  E11  E12 	Other combination is for factory use only.	E10—No Jumper E11—1-2 E12—1-2

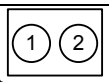
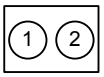
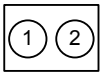
E13: Load Firmware

E-Point	Description	Default
E13 	1-2 to enable to re-download Turbo PMAC2 Firmware No jumper for normal operation	No Jumper

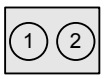
E14: Watchdog Disable

E-Point	Description	Default
E4 	1-2 to disable watchdog circuit. No jumper for normal operation.	No Jumper

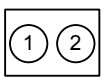
E15A, E15B & E15C: Flash Memory Bank Select

E-Point	Description	Default
E15A  E15B  E15C 	Factory Use Only	E15A— No Jumper E15B— No Jumper E15C— No Jumper

E40: USB/Ethernet Firmware Re-Download Enable

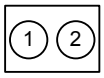
E-Point	Description	Default
E40 	1-2 for normal operation. Remove Jumper at Power up and then install jumper. It will be able to download USB/ETH Firmware.	1-2

E41: USB/Ethernet Disable

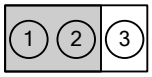
E-Point	Description	Default
E41 	1-2 to disable USB/Ethernet communication No jumper for normal operation.	No Jumper

E-Point Jumper Description for GIB Board (603946)

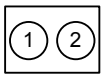
PL1: Stepper Output Enable for CH1

E-Point	Description	Default
PL1 	1-2 to enable PFM output from Encoder 1 connector	No Jumper

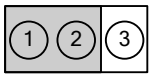
PL2: Encoder Power Selection for Encoder 1

E-Point	Description	Default
PL2 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

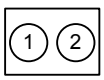
PL3: Stepper Output Enable for CH2

E-Point	Description	Default
PL3 	1-2 to enable PFM output from Encoder 2 connector	No Jumper

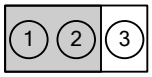
PL4: Encoder Power Selection for Encoder 2

E-Point	Description	Default
PL4 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

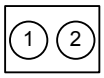
PL5: Stepper Output Enable for CH3

E-Point	Description	Default
PL5 	1-2 to enable PFM output from Encoder 1 connector	No Jumper

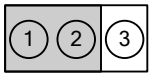
PL6: Encoder Power Selection for Encoder 3

E-Point	Description	Default
PL6 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

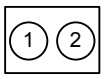
PL7: Stepper Output Enable for CH4

E-Point	Description	Default
PL7 	1-2 to enable PFM output from Encoder 1 connector	No Jumper

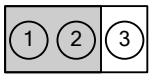
PL8: Encoder Power Selection for Encoder 4

E-Point	Description	Default
PL8 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

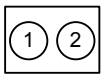
PL9: Stepper Output Enable for CH5

E-Point	Description	Default
PL9 	1-2 to enable PFM output from Encoder 1 connector	No Jumper

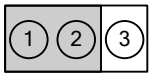
PL10: Encoder Power Selection for Encoder 5

E-Point	Description	Default
PL2 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

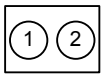
PL11: Stepper Output Enable for CH6

E-Point	Description	Default
PL11 	1-2 to enable PFM output from Encoder 1 connector	No Jumper

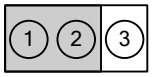
PL12: Encoder Power Selection for Encoder 6

E-Point	Description	Default
PL12 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

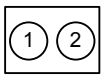
PL13: Stepper Output Enable for CH7

E-Point	Description	Default
PL13 	1-2 to enable PFM output from Encoder 1 connector	No Jumper

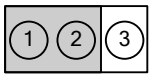
PL14: Encoder Power Selection for Encoder 7

E-Point	Description	Default
PL14 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

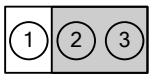
PL15: Stepper Output Enable for CH8

E-Point	Description	Default
PL15 	1-2 to enable PFM output from Encoder 1 connector	No Jumper

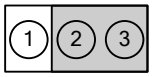
PL16: Encoder Power Selection for Encoder 8

E-Point	Description	Default
PL16 	1-2 is to use an internal 5V for Encoder Power. 2-3 is to use an external 5V for Encoder Power	1-2

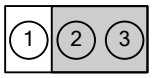
LK1: HOME Flag Input Voltage Selection for Ch1

E-Point	Description	Default
LK1 	1-2 is for 5V Home flag Input 2-3 is for 24V Home flag Input	2-3

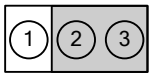
LK2: HOME Flag Input Voltage Selection for Ch2

E-Point	Description	Default
LK2 	1-2 is for 5V Home flag Input 2-3 is for 24V Home flag Input	2-3

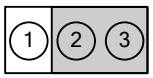
LK3: HOME Flag Input Voltage Selection for Ch3

E-Point	Description	Default
LK3 	1-2 is for 5V Home flag Input 2-3 is for 24V Home flag Input	2-3

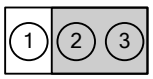
LK4: HOME Flag Input Voltage Selection for Ch4

E-Point	Description	Default
LK4 	1-2 is for 5V Home flag Input 2-3 is for 24V Home flag Input	2-3

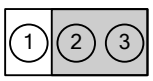
LK5: HOME Flag Input Voltage Selection for Ch5

E-Point	Description	Default
LK5 	1-2 is for 5V Home flag Input 2-3 is for 24V Home flag Input	2-3

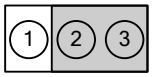
LK6: HOME Flag Input Voltage Selection for Ch6

E-Point	Description	Default
LK6 	1-2 is for 5V Home flag Input 2-3 is for 24V Home flag Input	2-3

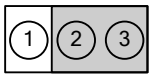
LK7: HOME Flag Input Voltage Selection for Ch7

E-Point	Description	Default
LK7 	1-2 is for 5V Home flag Input 2-3 is for 24V Home flag Input	2-3

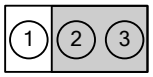
LK8: HOME Flag Input Voltage Selection for Ch8

E-Point	Description	Default
LK1 	1-2 is for 5V Home flag Input 2-3 is for 24V Home flag Input	2-3

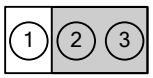
LK9: Positive Limit Input Voltage Selection for Ch1

E-Point	Description	Default
LK9 	1-2 is for 5V Positive Limit Input 2-3 is for 24V Positive Limit Input	2-3

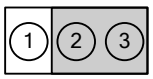
LK10: Positive Limit Input Voltage Selection for Ch2

E-Point	Description	Default
LK10 	1-2 is for 5V Positive Limit Input 2-3 is for 24V Positive Limit Input	2-3

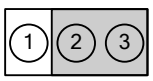
LK11: Positive Limit Input Voltage Selection for Ch3

E-Point	Description	Default
LK11 	1-2 is for 5V Positive Limit Input 2-3 is for 24V Positive Limit Input	2-3

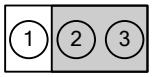
LK12: Positive Limit Input Voltage Selection for Ch4

E-Point	Description	Default
LK12 	1-2 is for 5V Positive Limit Input 2-3 is for 24V Positive Limit Input	2-3

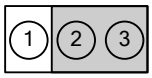
LK13: Positive Limit Input Voltage Selection for Ch5

E-Point	Description	Default
LK13 	1-2 is for 5V Positive Limit Input 2-3 is for 24V Positive Limit Input	2-3

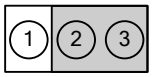
LK14: Positive Limit Input Voltage Selection for Ch6

E-Point	Description	Default
LK14 	1-2 is for 5V Positive Limit Input 2-3 is for 24V Positive Limit Input	2-3

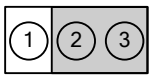
LK15: Positive Limit Input Voltage Selection for Ch7

E-Point	Description	Default
LK15 	1-2 is for 5V Positive Limit Input 2-3 is for 24V Positive Limit Input	2-3

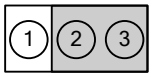
LK16: Positive Limit Input Voltage Selection for Ch8

E-Point	Description	Default
LK16 	1-2 is for 5V Positive Limit Input 2-3 is for 24V Positive Limit Input	2-3

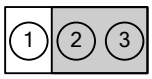
LK17: Negative Limit Input Voltage Selection for Ch1

E-Point	Description	Default
LK17 	1-2 is for 5V Negative Limit Input 2-3 is for 24V Negative Limit Input	2-3

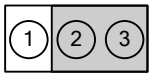
LK18: Negative Limit Input Voltage Selection for Ch2

E-Point	Description	Default
LK18 	1-2 is for 5V Negative Limit Input 2-3 is for 24V Negative Limit Input	2-3

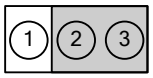
LK19: Negative Limit Input Voltage Selection for Ch3

E-Point	Description	Default
LK19 	1-2 is for 5V Negative Limit Input 2-3 is for 24V Negative Limit Input	2-3

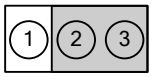
LK20: Negative Limit Input Voltage Selection for Ch4

E-Point	Description	Default
LK17 	1-2 is for 5V Negative Limit Input 2-3 is for 24V Negative Limit Input	2-3

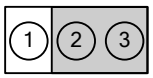
LK21: Negative Limit Input Voltage Selection for Ch5

E-Point	Description	Default
LK21 	1-2 is for 5V Negative Limit Input 2-3 is for 24V Negative Limit Input	2-3

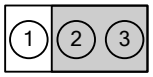
LK22: Negative Limit Input Voltage Selection for Ch6

E-Point	Description	Default
LK22 	1-2 is for 5V Negative Limit Input 2-3 is for 24V Negative Limit Input	2-3

LK23: Negative Limit Input Voltage Selection for Ch7

E-Point	Description	Default
LK23 	1-2 is for 5V Negative Limit Input 2-3 is for 24V Negative Limit Input	2-3

LK24: Negative Limit Input Voltage Selection for Ch8

E-Point	Description	Default
LK24 	1-2 is for 5V Negative Limit Input 2-3 is for 24V Negative Limit Input	2-3