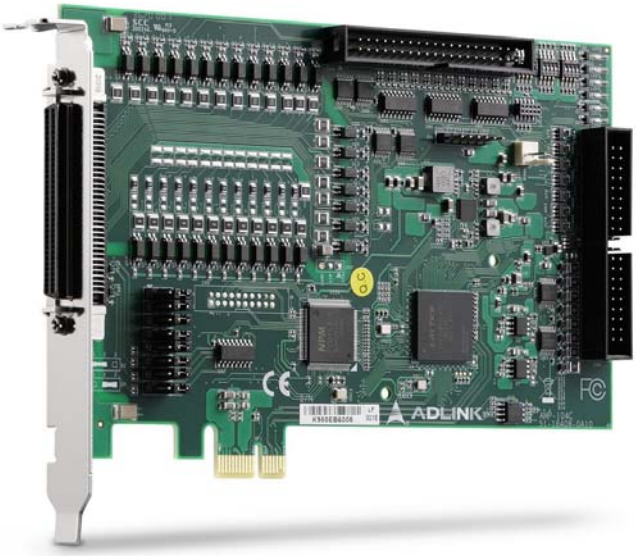
AMP-104C

4-Axis Pulse Motion Controller

User's Manual



Manual Rev.:	1.0
Revision Date:	2020-12-22
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Leading **EDGE COMPUTING**

Revision History

Revision	Release Date	Description of Change(s)
1.0	2020-12-22	Initial release

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Preface

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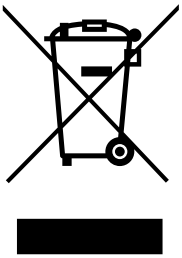
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Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.

NOTE: Additional information, aids, and tips that help users perform tasks.

CAUTION: Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.
ATTENTION: Informations destinées à prévenir les blessures corporelles mineures, les dommages aux composants, la perte de données et/ou la corruption de programme lors de l'exécution d'une tâche.

WARNING: Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.
AVERTISSEMENT: Informations destinées à prévenir les blessures corporelles graves, les dommages aux composants, la perte de données et/ou la corruption de programme lors de l'exécution d'une tâche spécifique.

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Table of Contents

Preface ..... **iii**

List of Tables ..... **vii**

List of Figures ..... **ix**

1 Introduction **1**

1.1 Overview 1
1.2 Features 2
1.3 Specifications 3
1.4 Supported Software 4
1.5 Accessories 5

2 Getting Started **7**

2.1 Package Contents 7
2.2 Board Layout 8
2.3 Hardware and Software Driver Installation 9
2.4 DIP Switch Settings 12
2.5 Jumper Setting: Pulse Output Mode Selection 15
2.6 Pin Assignments to Connectors 15

3 Signal Connections **21**

3.1 Pulse Output Signals 22
3.2 Encoder Feedback Input Signal 26
3.3 Motion I/O Interface Signal 28
3.4 GPIO Interface Signal 32
3.5 Other I/O Interface Signal 35

Important Safety Instructions **37**

Consignes de Sécurité Importante **39**

Getting Service **43**

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List of Tables

Table 2-1: Board Features Legend 8
Table 2-2: SW1 Card ID Selection 12
Table 2-3: SW2 End Limit Type Selection 13
Table 2-4: SW3 DO Initial State Selection 14
Table 2-5: CN1 External Stop/Start Signals 15
Table 2-6: CN2 AMP-104C Main Connector 17
Table 2-7: CN3 Extended TTL DIO 18
Table 2-8: CN4 Extended Encoder Feedback Input Signals 19
Table 3-1: Pulse Output Signals 22

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List of Figures

Figure 1-1: Functional Diagram..... 1
Figure 2-1: AMP-104C Board Layout..... 8

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1 Introduction

1.1 Overview

The AMP-104C is a cost-effective 4-axis motion controller card with a PCI Express® interface that can generate a pulse train up to 4.9MHz to control a motor. With more general purpose IOs and 4-channel encoder feedback input, the AMP-104C can be used for a multitude of scenarios or applications.

As a motion controller, the AMP-104C provides non-symmetric acceleration and deceleration speed profile settings, T-curve and S-curve speed profile control, and selection of motion stop method. Also, changing speed on the fly with a single axis operation, linear Interpolation with any 2 axes, and simultaneously start/stop on multiple axes are also available.

Multiple AMP-104C cards can be installed in one system. The onboard switch can be used to the set a specific index for each board in order to manage multiple cards.

Figure 1-1 shows the AMP-104C card functional diagram. All functions and computations are performed internally by the ASIC and FPGA, thus limiting the impact on the PC's CPU.

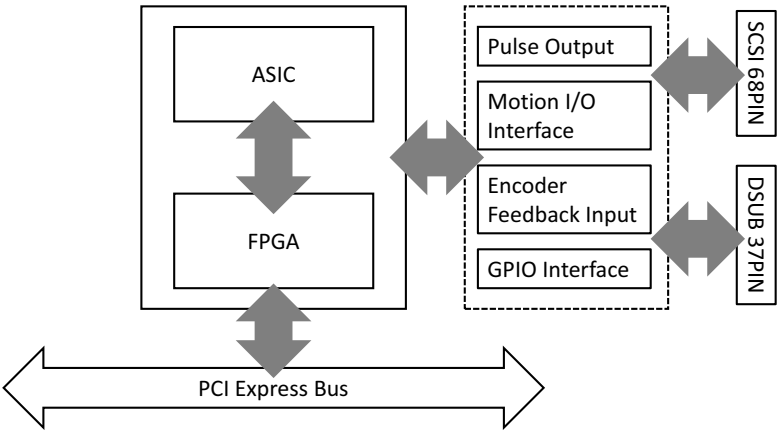


Figure 1-1: Functional Diagram

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1.2 Features

The following list summarizes the main features of the AMP-104C motion control system.

- 4 Axes Pulse Type Motion Card
- PCI Express® Gen1 x1
- Supports up to 16 Cards in One System
- Pulse Output Frequency up to 4.9 Mpps
- Pulse Output Mode: CW/CCW, OUT/DIR
- Encoder Feedback Input Frequency up to 20 MHz
- Mechanical Signal Input
- 28-ch Onboard Isolated GPIO/31-ch Extended TTL GPIO
- 8-ch Position Latch Trigger Input
- Selection of Card Index by Switch
- Selection of EL Logic NO/NC Mode by Switch
- Selection of DO Initial State by Switch
- Selection of Motion Stop Method: EMG / Deceleration Stop
- External Start/Stop Control (STA/STP)
- Current Position Counter/Encoder Feedback Counter
- Programmable Interrupt Control
- Linear and S-curve Acceleration/Deceleration Control
- Speed Change On-The-Fly
- 3 Home Return Modes
- Linear Interpolation
- Security Protection for User's Program

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1.3 Specifications

Pulse Type Motion Control	
Max. Axes	4
Pulse Output Frequency	0.5 pps to 4.9 Mpps
Pulse Output Mode	CW/CCW, OUT/DIR
Pulse Output Type	Differential / Single-End
Encoder Feedback Input Mode	CW/CCW; OUT/DIR; 1x/2x/4x AB Phase
Encoder Feedback Input Frequency	5 MHz (up to 20 MHz at 4x AB)
Encoder Feedback Counter Resolution	32-bit
Positon Counter Resolution	24-bit
Motion I/O Interface Signals	
External Stop/Start Signal Pin	STP and STA
End Limit Signal Pin	PEL and MEL
Slow Down Signal Pin	PSD and MSD
Home Sensor	ORG
GPIO Interface Signals	
GPIO Onboard	16-ch Optically Isolated DI
	12-ch Optically Isolated DO
GPIO Extended	16-ch Non-isolated TTL DI
	15-ch Non-isolated TTL DO
General Specifications	
Main Connector	68-pin SCSI-Type Connector
Extend Connector	40-pin to 37-pin SCSI Box Header
Operating Temperature	0°C to 60°C
Storage Temperature	-20°C to 80°C
Humidity	5% to 85%, non-condensing
Power Consumption	
External Power Supply (Input)	24V DC ±5%

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1.4 Supported Software

1.4.1 OS Support / Software Compatibility

- OS Support
  - Windows 7/8/10 (x86/x64)
- Software Compatibility
  - Visual Studio VB.NET, C#, VC.NET Compatible
  - APS Function Library Support

1.4.2 APS Functions

The AMP-104C is fully compliant with the APS (Automation Product Software) function library, independent of programming languages and operating systems (OS). A complete detailed listing of functions can be found in the APS Function Library User Manual.

1.4.3 MotionCreatorPro 2 (MCP2)

MotionCreatorPro2™ is a user interface exclusively developed for ADLINK motion control products in a standard Windows environment to easily to setup cards and axis parameters. A Setup Wizard guides users through hardware installation and wiring as well as single-axis manipulation in minutes.

MotionCreatorPro2™ not only effectively reduces development time but also enables concurrent validation of overall mechanism and electric design with all single axis and interpolation motion operation pages.

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1.5 Accessories

The main connector utilizes ADLINK's exclusive DIN-68S terminal board and ACL-10569 cable. For extended connectors, TTL DI/O and Encoder Feedback Input, use a DIN-37 terminal board with ACL-10437 and ACL-10137 cables (sold separately).

	Main Function	TTL DI/O	Encoder Feedback Input
Terminal Board			
DIN-68S-01	Yes		
DIN-37D-01		Yes	Yes
Cable			
ACL-10569-X, X = 1, 2, 3 (M)	Yes		
ACL-10137-X, X = 1, 2, 3, 5 (M)		Yes	Yes
ACL-10437		Yes	Yes

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2 Getting Started

This chapter describes how to install and connect to the AMP-104C, its hardware settings, and related signals.

2.1 Package Contents

The package includes the following items:

- 1x AMP-104C Card 4-Axis Pulse Motion Controller
- Product Warranty Card

If any of these items are missing or damaged, contact the dealer from whom you purchased the product. Save the shipping materials and carton to ship or store the product in the future.

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2.2 Board Layout

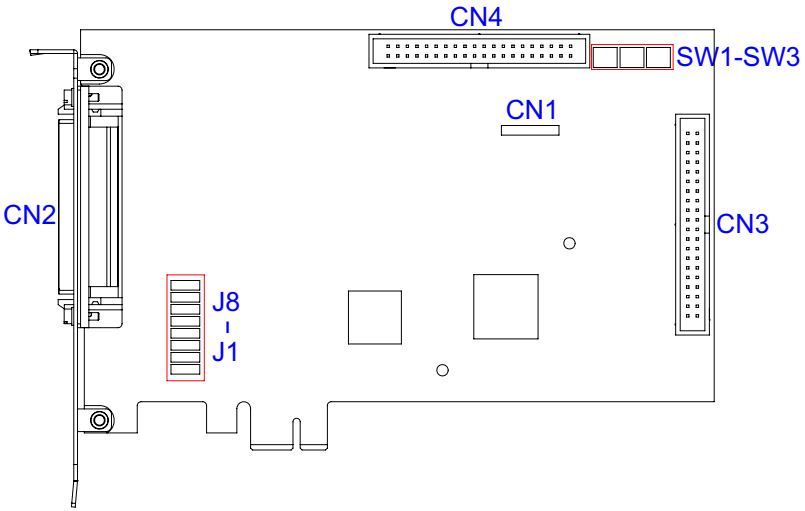


Figure 2-1: AMP-104C Board Layout

Item	Description
SW1	Card ID Selection Switch
SW2	End Limit Type Selection Switch
SW3	DO Initial State Selection Switch
J1-J8	Pulse Output Mode Selection Jumper
CN1	External Stop/Start Signals 6-pin header (ST/D2.54)
CN2	AMP-104C Main Connector 68-pin SCSI
CN3	Extended TTL DIO 40-pin box header
CN4	Extended Encoder Feedback Input Signals 40-pin box header

Table 2-1: Board Features Legend

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2.3 Hardware and Software Driver Installation

2.3.1 Hardware Configuration

The AMP-104C is fully Plug-and-Play compliant and can be installed in any PCI Express slot. It employs a PCI Express Gen1 x1 bus, and the system BIOS can auto-configure memory and IRQ channels.

ADLINK's exclusive DIN-68S-01 terminal board and ACL-10569 cable combine for an easy-to-use set to connect to external drivers. The DIN-37D-01 terminal board and ACL-10137/ACL-10437 cables is another easy-to-use set to fulfill extra functions.

2.3.2 Installation Procedures

1. Read through this manual and setup the switches, jumper and I/O signals according to your application.

2. Turn off the computer and all relevant terminal boards, and install the AMP-104C in any available PCI Express x1/x4/x8/x16 slot. Make sure you have proper ESD (Electrostatic discharge) protection.

3. Connect the AMP-104C and DIN-68S-01 with the ACL-10569 (68-pin SCSI-II) cable.

4. Connect the AMP-104C and DIN-37D-01 with the ACL-10137 (37-pin D-SUB) and ACL-10437 cables (if applicable).

5. Set up servo or stepper drive connection as well as mechanical signals, GPIO and any essential drive signals.

6. Turn on the system power including computer power, terminal board power, and 24V DC power.

7. Verify all signals and servo operation via MotionCreatorPro2.

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2.3.3 Troubleshooting

If the computer cannot power on normally or the motion control system operates abnormally after system installation, follow the steps described below for troubleshooting. If the problem persists, please consult the dealer for technical services.

Problem	Correction
The card does not appear in Windows Device Manager after its driver has been installed	Ensure the card is properly mounted in PCI Express slot and the driver is properly installed in Windows Control Panel's "Add/remove programs"
MotionCreatorPro2™ is not lunch after driver installation	Ensure .NET framework v3.5 or later version has been installed
The NO Signal indicator in MotionCreatorPro2™ appears after the motor is connected and the motor does not work.	Ensure 24 VDC power is provided to the system
When using the MotionCreatorPro2™, all the control indicators of the drive light correctly but the drive warns	Ensure correctness of the axis parameter setup, alarm logic (ALM) and the EMG loop configuration
Value of output command differs from the encoder feedback	Ensure encoder feedback signal (CW/CCW, OUT/DIR, 1xAB, 2xAB, 4xAB) settings comply with that of the drive
During motion control, the motor moves only in one direction rather than both back and forth movement	Ensure setting of signal pattern (CW/CCW, OUT/DIR) comply with that of the motor drive

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2.3.4 Software Driver Installation

1. Download the AMP-104C WDM file from ADLINK and run it. Installation executes automatically.

2. Select **NEXT** as prompted to complete installation.

3. After installation is complete, select **FINISH**.

4. Ensure the Windows Device Manager lists the AMP-104C correctly.

5. Restart the computer immediately, or later, as desired.

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2.4 DIP Switch Settings

2.4.1 SW1 – Card ID Selection

The SW1 switch is used to set the card ID. For example, if 1 is set to ON and the others are OFF, that card index is 1. The index value can be from 0 to 15. Refer to the following table for details.

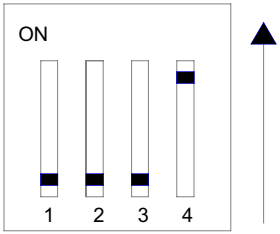
Card ID	Switch Setting (ON=1)
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
10	1010
11	1011
12	1100
13	1101
14	1110
15	1111 (default)

Table 2-2: SW1 Card ID Selection

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2.4.2 SW2 – End Limit Type Selection

The SW2 switch is used to set the type of end limit logic, which are Normally Open (NO) and Normally Closed (NC). For example, if the switch pin is set to “OFF”, the type of end limit logic is Normally Open. Refer to the following table for details.



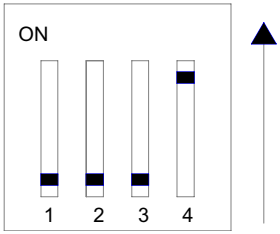
Axis #	SW2 Pin No.	NO (Default)	NC
0	1	OFF	ON
1	2	OFF	ON
2	3	OFF	ON
3	4	OFF	ON

Table 2-3: SW2 End Limit Type Selection

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2.4.3 SW3 – DO Initial State Selection

The SW3 switch is used to set the initial DO state group setting. For example, if the SW3 Pin1 is set to “OFF”, the initial states of “DO0 to DO3” are high. Refer to the following table for details.



DO #	SW3 Pin No.	High (Default)	Low
DO0 - DO3	1	OFF	ON
DO4 - DO11	2	OFF	ON
TDO0 - TDO7	3	OFF	ON
TDO8 - TDO14	4	OFF	ON

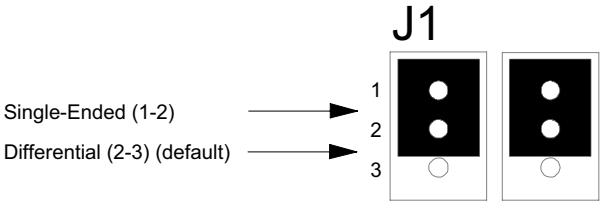
Table 2-4: SW3 DO Initial State Selection

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2.5 Jumper Setting: Pulse Output Mode Selection

Jumpers J1-J8 are used to set the mode of pulse output signals. The output signal mode can either be differential line driver or single-ended output. Refer to Section 3.1 for detailed jumper settings.

J1 & J2	Axis 0
J3 & J4	Axis 1
J5 & J6	Axis 2
J7 & J8	Axis 3



2.6 Pin Assignments to Connectors

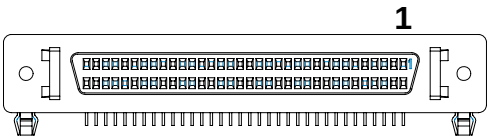
2.6.1 CN1 – External Stop/Start Signals

No.	Name	I/O	Function
1	GND	-	Digital GND
2	STP/EMG	I/O	STOP Signal
3	STA	I/O	START Signal
4	STP/EMG	I/O	STOP Signal
5	STA	I/O	START Signal
6	+3V3	O	Digital Power +3.3V, output current limit: 1000mA

Table 2-5: CN1 External Stop/Start Signals

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2.6.2 CN2 – AMP-104C Main Connector



No.	Name	I/O	Function	No.	Name	I/O	Function
1	GND	--	Digital GND	35	OUT2+	O	Pulse Signal +
2	OUT0+	O	Pulse Signal +	36	OUT2-	O	Pulse Signal -
3	OUT0-	O	Pulse Signal -	37	DIR2+	O	Direction Signal +
4	DIR0+	O	Direction Signal +	38	DIR2-	O	Direction Signal -
5	DIR0-	O	Direction Signal -	39	OUT3+	O	Pulse Signal +
6	OUT1+	O	Pulse Signal +	40	OUT3-	O	Pulse Signal -
7	OUT1-	O	Pulse Signal -	41	DIR3+	O	Direction Signal +
8	DIR1+	O	Direction Signal +	42	DIR3-	O	Direction Signal -
9	DIR1-	O	Direction Signal -	43	DO0	O	Digital Output
10	PEL0	I	Positive End Limit Signal	44	DO1	O	Digital Output
11	MEL0	I	Negative End Limit Signal	45	DO2	O	Digital Output
12	PSD0	I	Positive Ramping-down Signal	46	DO3	O	Digital Output
13	MSD0	I	Negative Ramping-down Signal	47	DO4	O	Digital Output
14	ORG0	I	Origin Position Signal	48	DO5	O	Digital Output
15	PEL1	I	Positive End Limit Signal	49	DO6	O	Digital Output
16	MEL1	I	Negative End Limit Signal	50	DO7	O	Digital Output
17	PSD1	I	Positive Ramping-down Signal	51	DO8	O	Digital Output
18	MSD1	I	Negative Ramping-down Signal	52	DO9	O	Digital Output

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No.	Name	I/O	Function	No.	Name	I/O	Function
19	ORG1	I	Origin Position Signal	53	DO10	O	Digital Output
20	PEL2	I	Positive End Limit Signal	54	DO11	O	Digital Output
21	MEL2	I	Negative End Limit Signal	55	DI4	I	Digital Input
22	PSD2	I	Positive Ramping-down Signal	56	DI5	I	Digital Input
23	MSD2	I	Negative Ramping-down Signal	57	DI6	I	Digital Input
24	ORG2	I	Origin Position Signal	58	DI7	I	Digital Input
25	PEL3	I	Positive End Limit Signal	59	DI8	I	Digital Input
26	MEL3	I	Negative End Limit Signal	60	DI9	I	Digital Input
27	PSD3	I	Positive Ramping-down Signal	61	DI10	I	Digital Input
28	MSD3	I	Negative Ramping-down Signal	62	DI11	I	Digital Input
29	ORG3	I	Origin Position Signal	63	DI12	I	Digital Input
30	DI0	I	Digital Input	64	DI13	I	Digital Input
31	DI1	I	Digital Input	65	DI14	I	Digital Input
32	DI2	I	Digital Input	66	EXGND	--	Isolation GND
33	DI3	I	Digital Input	67	E24V	I	Isolation Power +24V
34	EXGND	--	Isolation GND	68	DI15	I	Digital Input

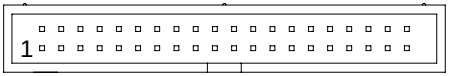
Table 2-6: CN2 AMP-104C Main Connector



Pins 1-9, 35-42: Non-Isolation Signals.

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2.6.3 CN3 – Extended TTL DIO



No.	Name	I/O	Function	No.	Name	I/O	Function
1	TDI0	I	TTL Input	2	TDI1	I	TTL Input
3	TDI2	I	TTL Input	4	TDI3	I	TTL Input
5	TDI4	I	TTL Input	6	TDI5	I	TTL Input
7	TDI6	I	TTL Input	8	TDI7	I	TTL Input
9	TDI8	I	TTL Input	10	TDI9	I	TTL Input
11	TDI10	I	TTL Input	12	TDI11	I	TTL Input
13	TDI12	I	TTL Input	14	TDI13	I	TTL Input
15	TDI14	I	TTL Input	16	TDI15	I	TTL Input
17	+3V3	O	Digital Power +3.3V	18	+3V3	O	Digital Power +3.3V
19	GND	--	Digital GND	20	GND	--	Digital GND
21	TDO0	O	TTL Output	22	TDO1	O	TTL Output
23	TDO2	O	TTL Output	24	TDO3	O	TTL Output
25	TDO4	O	TTL Output	26	TDO5	O	TTL Output
27	TDO6	O	TTL Output	28	TDO7	O	TTL Output
29	TDO8	O	TTL Output	30	TDO9	O	TTL Output
31	TDO10	O	TTL Output	32	TDO11	O	TTL Output
33	TDO12	O	TTL Output	34	TDO13	O	TTL Output
35	TDO14	O	TTL Output	36	----	--	Reserved
37	GND	--	Digital GND	38	----	--	Reserved
39	----	--	Reserved	40	----	--	Reserved

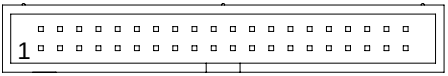
Table 2-7: CN3 Extended TTL DIO

NOTE:

+3V3 output current limit: 1000mA

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2.6.4 CN4 – Extended Encoder Feedback Input Signals



No.	Name	I/O	Function	No.	Name	I/O	Function
1	EA0+	I	Encoder A-phase+	2	EA0-	I	Encoder A-phase-
3	EB0+	I	Encoder B-phase+	4	EB0-	I	Encoder B-phase-
5	EZ0+	I	Encoder Z-phase+	6	EZ0-	I	Encoder Z-phase-
7	DGND	--	Digital GND	8	DGND	--	Digital GND
9	DGND	--	Digital GND	10	DGND	--	Digital GND
11	EA1+	I	Encoder A-phase+	12	EA1-	I	Encoder A-phase-
13	EB1+	I	Encoder B-phase+	14	EB1-	I	Encoder B-phase-
15	EZ1+	I	Encoder Z-phase+	16	EZ1-	I	Encoder Z-phase-
17	DGND	--	Digital GND	18	DGND	--	Digital GND
19	DGND	--	Digital GND	20	DGND	--	Digital GND
21	EA2+	I	Encoder A-phase+	22	EA2-	I	Encoder A-phase-
23	EB2+	I	Encoder B-phase+	24	EB2-	I	Encoder B-phase-
25	EZ2+	I	Encoder Z-phase+	26	EZ2-	I	Encoder Z-phase-
27	DGND	--	Digital GND	28	DGND	--	Digital GND
29	DGND	--	Digital GND	30	DGND	--	Digital GND
31	EA3+	I	Encoder A-phase+	32	EA3-	I	Encoder A-phase-
33	EB3+	I	Encoder B-phase+	34	EB3-	I	Encoder B-phase-
35	EZ3+	I	Encoder Z-phase+	36	EZ3-	I	Encoder Z-phase-
37	DGND	--	Digital GND	38	DGND	--	Digital GND
39	DGND	--	Digital GND	40	DGND	--	Digital GND

Table 2-8: CN4 Extended Encoder Feedback Input Signals

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3 Signal Connections

Signal connections of all I/O's are described in this chapter. Refer to the contents of this chapter before wiring any cables between the AMP-104C and any motor drivers.

This chapter contains the following sections:

Section 3.1:Pulse Output Signals

Section 3.2:Encoder Feedback Input Signal

Section 3.3:Motion I/O Interface Signal

Section 3.4:GPIO Interface Signal

Section 3.5:Other I/O Interface Signal

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3.1 Pulse Output Signals

There are 4 axis pulse output signals on the AMP-104C, each supporting up to 4.9 MHz output frequency. For each axis, two pairs of OUT and DIR signals are used to transmit the pulse train and to indicate the direction. In this section, the electrical characteristics of the OUT and DIR signals are detailed. Each signal consists of a pair of differential signals. For example, OUT2 consists of OUT2+ and OUT2- signals. The following table shows all pulse output signals on CN2.

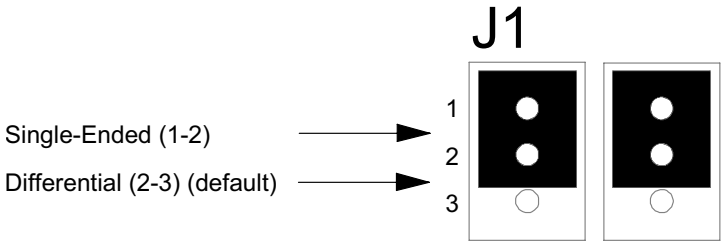
Max. Axes	4
Pulse Output Frequency	Up to 4.9 MHz
Pulse Output Mode	CW/CCW, OUT/DIR
Pulse Output Type	Differential / Single-End

Axis #	CN2 Pin No.	Signal Name	Description
0	2	OUT0+	Pulse Signal +
	3	OUT0-	Pulse Signal -
	4	DIR0+	Direction Signal +
	5	DIR0-	Direction Signal -
1	6	OUT1+	Pulse Signal +
	7	OUT1-	Pulse Signal -
	8	DIR1+	Direction Signal +
	9	DIR1-	Direction Signal -
2	35	OUT2+	Pulse Signal +
	36	OUT2-	Pulse Signal -
	37	DIR2+	Direction Signal +
	38	DIR2-	Direction Signal -
3	39	OUT3+	Pulse Signal +
	40	OUT3-	Pulse Signal -
	41	DIR3+	Direction Signal +
	42	DIR3-	Direction Signal -

Table 3-1: Pulse Output Signals

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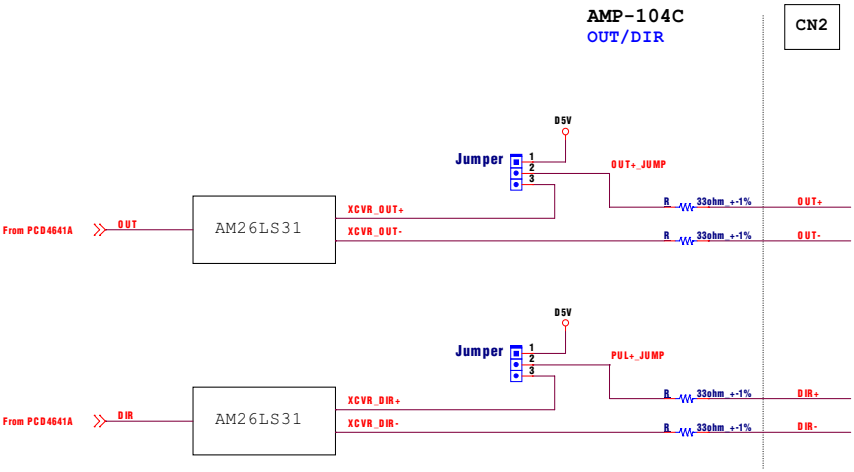
The output of the signals can be configured by jumpers as either Single-Ended or Differential Line Driver output. Users can select the output mode either by closing breaks between 1 and 2 or 2 and 3 of jumpers J1-J8 as follows:



Axis #	Signal Name	Jumper	Single-Ended Output	Differential Line Driver Output
0	OUT0	J1	Close breaks between 1 and 2	Close breaks between 2 and 3
	DIR0	J2		
1	OUT1	J3		
	DIR1	J4		
2	OUT2	J5		
	DIR2	J6		
3	OUT3	J7		
	DIR3	J8		

The default setting of OUT and DIR is set to differential line driver mode. The following wiring diagram is for OUT and DIR signals on the 4 axes.

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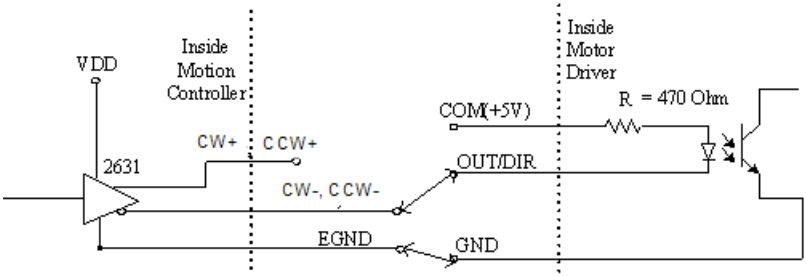
NOTE:

If the pulse output is set to Single-Ended output mode, CW- and CCW- are used to transmit CW and CCW signals. The sink current must not exceed 20mA on the CW- and CCW- pins. The default setting of jumper is 2-3 shorted.

Suggest Usage: Jumper 2-3 shorted and connect CW+/CCW+ to a 470 ohm pulse input interface's COM of driver. See the following figure.

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Choose one of CW/CCW+ and CW/CCW- to connect to driver's OUT/DIR



WARNING:

The sink current must not exceed 20mA or the 2631 will be damaged!

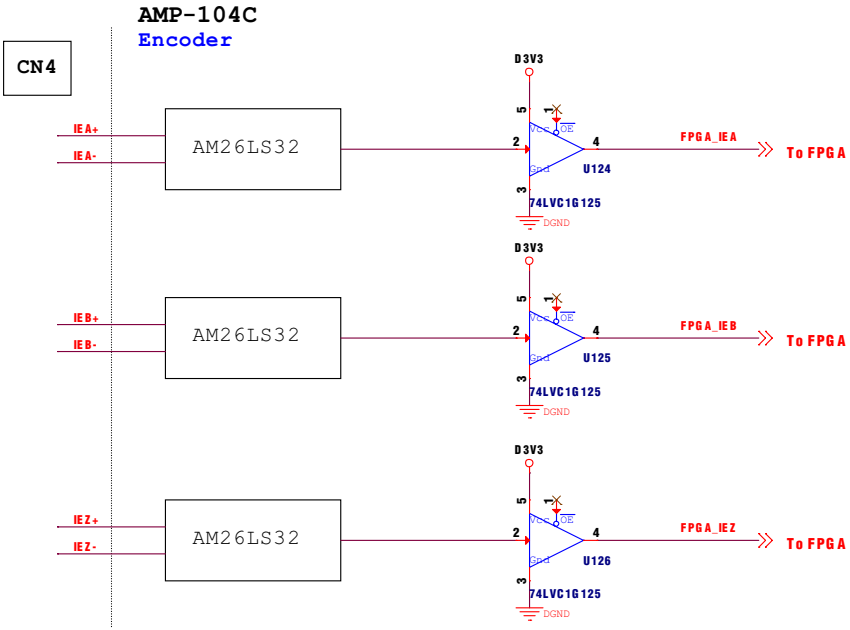
3.2 Encoder Feedback Input Signal

The AMP-104C provides 4 encoder feedback input channels each with up to 5MHz and EA, EB, and EZ signals. Each group of EA, EB, and EZ signals contains a pair of differential signals (e.g. the EA signal contains EA+ and EA-).

A 32-bit counter for each encoder feedback input axis and three kinds of decoder modes (CW/CCW, OUR/DIR, 1x/2x/4x AB Phase) are available. For more information, see the APS Function Library User Manual.

Axis #	CN4 Pin No.	Signal Name	CN4 Pin No.	Signal Name
0	1	EA0+	2	EA0-
	3	EB0+	4	EB0-
	5	EZ0+	6	EZ0-
1	11	EA1+	12	EA1-
	13	EB1+	14	EB1-
	15	EZ1+	16	EZ1-
2	21	EA2+	22	EA2-
	23	EB2+	24	EB2-
	25	EZ2+	26	EZ2-
3	31	EA3+	32	EA3-
	33	EB3+	34	EB3-
	35	EZ3+	36	EZ3-

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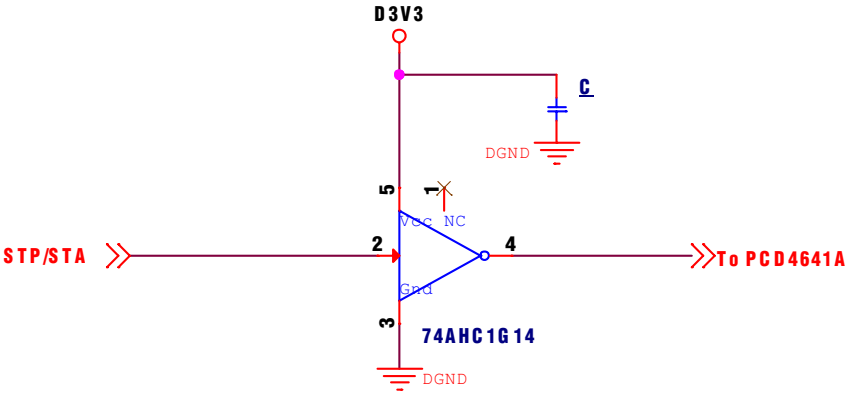
3.3 Motion I/O Interface Signal

3.3.1 External Stop/Start Signals (STP/STA)

The AMP-104C provides STP and STA signals, which not only enable simultaneous stop/start of motions on multiple axes, but STP can stop a motor in an emergency. If the external emergency stop signal is triggered, all motion control commands will be stopped immediately. See the table below for corresponding pins of STP and STA signals:

Pin No.	Signal Name	Description
2/4	STP/EMG	STOP signal
3/5	STA	START signal

The diagram below shows the onboard circuit. The STA and STP signals of the four axes are tied together respectively.



The STA and STP signals are input signals. To operate the start and stop action simultaneously, both software control and external control are needed. With software control, the signals must be generated from an external event to the PCD4641 chip. Users can also use an external open collector or switch to drive the STA/STP signals for simultaneous start/stop.

If there are two or more AMP-104C cards, tie all STA and all STP signals of all cards for simultaneous start/stop control on all concerned axes.

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3.3.2 Mechanical Signal Input

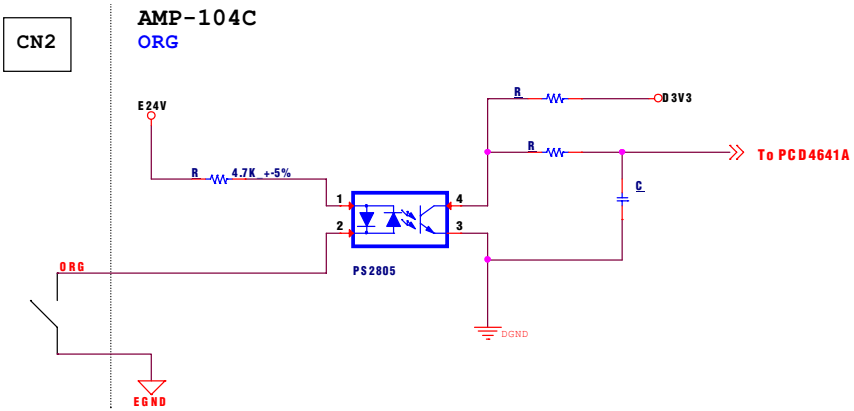
The AMP-104C provides some dedicated input pins for mechanical signals such as original position signal (ORG), direction end limit signals (PEL/MEL), and direction ramping-down point detection signals (PSD/MSD).

3.3.2.1 Origin Position Signal (ORG)

The AMP-104C provides one original or home signal for each axis. This signal is used for defining the zero position of this axis. The logic of this signal must be set properly before doing home procedure.

Axis #	CN2 Pin No.	Signal Name
0	14	ORG0
1	19	ORG1
2	24	ORG2
3	29	ORG3

The input circuit of the ORG signals is shown below. Usually, a limit switch is used to indicate the origin on one axis. The specifications of the limit switch should have a contact capacity of +24V at 10mA minimum. An internal filter circuit is used to filter out any high frequency spikes, which may cause errors in the operation.



When the motion controller is operated in the home return mode, the ORG signal is used to inhibit the Pulse Output Signals.

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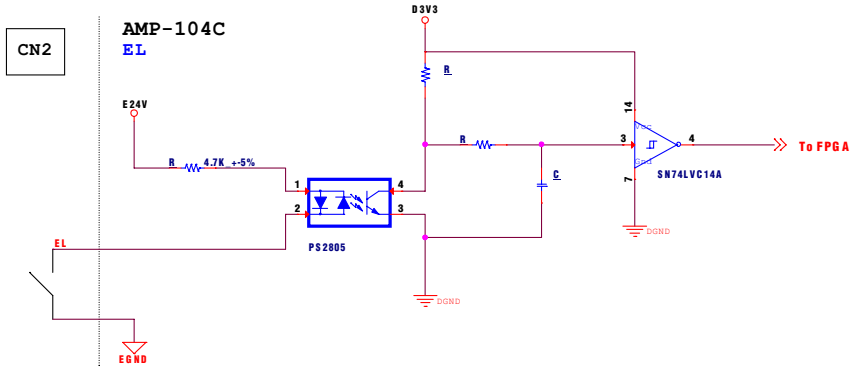
3.3.2.2 Direction End Limit Signal (PEL / MEL)

The end-limit switches are usually installed on both ends of an axis. The positive EL must be installed at the positive position of the axis, and vice versa. If they are installed reversely, the protection will be invalid. These two signals are for safety, which can prevent a machine crash when missing an operation.

The AMP-104C provides two direction end limit signals, PEL and MEL, for each axis. PEL indicates the end limit signal is in the positive direction and MEL indicates the end limit signal is in the negative direction.

Axis #	CN2 Pin No.	Signal Name	CN2 Pin No.	Signal Name
0	10	PEL0	11	MEL0
1	15	PEL1	16	MEL1
2	20	PEL2	21	MEL2
3	25	PEL3	26	MEL3

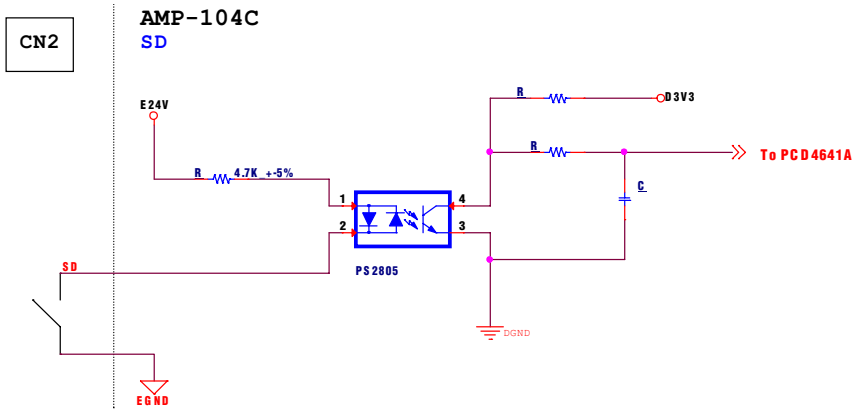
The external limit switch should have a contact capacity of +24V at 10mA minimum. The EL logical can be configured via switch.



3.3.2.3 Direction Ramping-down Point Detection Signal (PSD / MSD)

The AMP-104C provides a slow down function through PSD or MSD signal input for each axis. PSD indicates the direction is in the positive and MEL indicates the direction is in the negative.

Axis #	CN2 Pin No.	Signal Name	CN2 Pin No.	Signal Name
0	12	PSD0	13	MSD0
1	17	PSD1	18	MSD1
2	22	PSD2	23	MSD2
3	27	PSD3	28	MSD3



3.4 GPIO Interface Signal

The AMP-104C provides a 28-channel onboard isolated GPIO (DI/DO) and a 31-channel extended TTL GPIO (TDI/TDO).

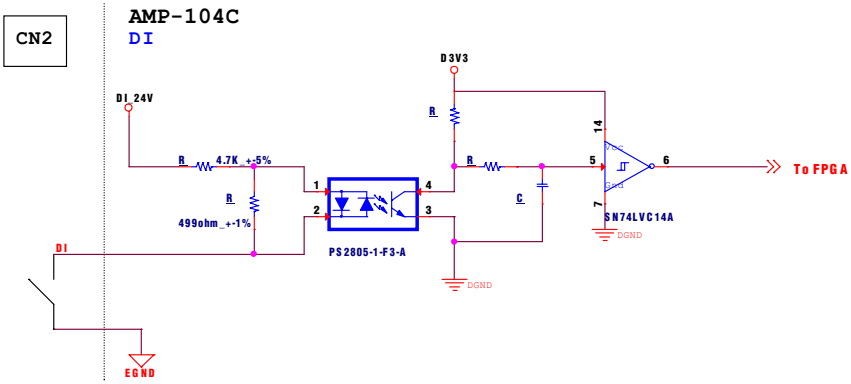
GPIO Onboard	Main Connector CN2	16 CH Optically Isolated DI
		12 CH Optically Isolated DO
GPIO Extended	Extend Connector CN3	16 CH Non-isolated TTL DI
		15 CH Non-isolated TTL DO

3.4.1 28-Channel Onboard Isolated GPIO (DI/DO)

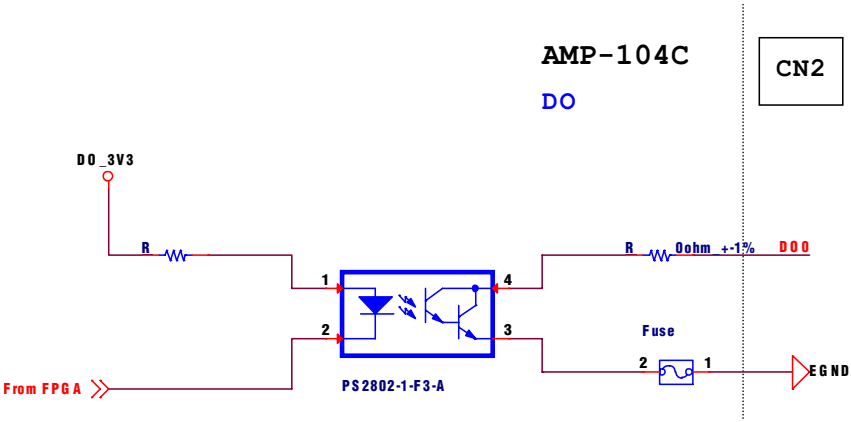
CN2 Pin No.	Signal Name	CN2 Pin No.	Signal Name
30	DI0	43	DO0
31	DI1	44	DO1
32	DI2	45	DO2
33	DI3	46	DO3
55	DI4	47	DO4
56	DI5	48	DO5
57	DI6	49	DO6
58	DI7	50	DO7
59	DI8	51	DO8
60	DI9	52	DO9
61	DI10	53	DO10
62	DI11	54	DO11
63	DI12		
64	DI13		
65	DI14		
68	DI15		

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Optically Isolated Digital Input:



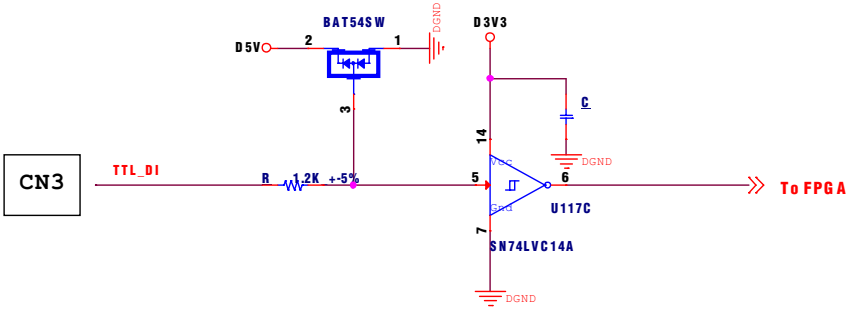
Optically Isolated Digital Output:



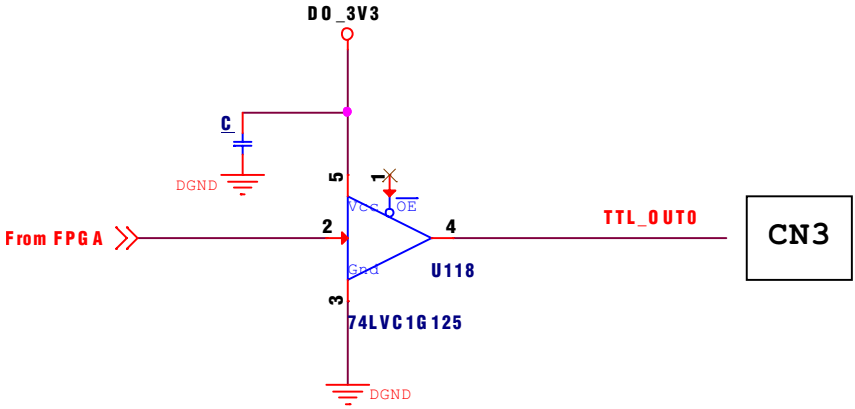
3.4.2 31-Channel Extended TTL GPIO (TDI/TDO)

CN3 Pin No.	Signal Name	CN3 Pin No.	Signal Name
1	TDI0	21	TDO0
2	TDI1	22	TDO1
3	TDI2	23	TDO2
4	TDI3	24	TDO3
5	TDI4	25	TDO4
6	TDI5	26	TDO5
7	TDI6	27	TDO6
8	TDI7	28	TDO7
9	TDI8	29	TDO8
10	TDI9	30	TDO9
11	TDI10	31	TDO10
12	TDI11	32	TDO11
13	TDI12	33	TDO12
14	TDI13	34	TDO13
15	TDI14	35	TDO14
16	TDI15		

Non-isolated TTL Digital Input:



Non-isolated TTL Digital Output:



3.5 Other I/O Interface Signal

3.5.1 Position Latch Trigger Input (LTC)

The AMP-104C provides 8-channel position latch trigger inputs, which are common with DI and TDI. With encoder feedback input signals, a position latch function is available for each axis.

Any 8-channel position latch trigger input can be assigned to a latch source to trigger any axis by software. The AMP-104C provides 255 position latch buffer points for each axis. For more information, see the APS Function Library User Manual.

CN2 Pin No.	Signal Name	CN3 Pin No.	Signal Name
30	DI0 / LTC	1	TDI0 / LTC
31	DI1 / LTC	2	TDI1 / LTC
32	DI2 / LTC	3	TDI2 / LTC
33	DI3 / LTC	4	TDI3 / LTC

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Important Safety Instructions

For user safety, please read and follow all instructions, Warnings, Cautions, and Notes marked in this manual and on the associated device before handling/operating the device, to avoid injury or damage.

- Read these safety instructions carefully.
- Keep the User's Manual for future reference.
- Read the Specifications section of this manual for detailed information on the recommended operating environment.
- The device can be operated at an ambient temperature of 45ºC with DC input, and 35ºC with adapter input.
- It is recommended that the device be installed in Information Technology Rooms that are in accordance with Article 645 of the National Electrical Code and NFPA 75.
- To avoid electrical shock and/or damage to device:
  - Keep device away from water or liquid sources.
  - Keep device away from high heat or humidity.
  - Keep device properly ventilated (do not block or cover ventilation openings).
  - Always use recommended voltage and power source settings.
  - Always install and operate device near an easily accessible electrical outlet.
  - Secure the power cord (do not place any object on/over the power cord).
  - Only install/attach and operate device on stable surfaces and/or recommended mountings.
  - The power cord must be connected to a socket or outlet with a ground connection.
- If the device will not be used for long periods of time, turn off and unplug from its power source.
- Never attempt to repair the device, which should only be serviced by qualified technical personnel using suitable tools.

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- A Lithium-type battery may be provided for uninterrupted backup or emergency power.



Risk of explosion if battery is replaced with one of an incorrect type; please dispose of used batteries appropriately.

- This equipment is not suitable for use in locations where children are likely to be present.
- The device must be serviced by authorized technicians when:
  - The power cord or plug is damaged
  - Liquid has entered the device interior
  - The device has been exposed to high humidity and/or moisture
  - The device is not functioning or does not function according to the User's Manual
  - The device has been dropped and/or damaged and/or shows obvious signs of breakage
- Disconnect the power supply cord before loosening the thumbscrews and always fasten the thumbscrews with a screwdriver before starting the system up
- It is recommended that the device be installed only in a server room or computer room where access is:
  - Restricted to qualified service personnel or users familiar with restrictions applied to the location, reasons therefor, and any precautions required
  - Only afforded by the use of a tool or lock and key, or other means of security, and controlled by the authority responsible for the location



BURN HAZARD

Hot surface! Do not touch! Touching this surface could result in bodily injury. To reduce risk, allow the surface to cool before touching.

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Consignes de Sécurité Importante

S'il vous plaît prêter attention stricte à tous les avertissements et mises en garde figurant sur l'appareil, pour éviter des blessures ou des dommages.

- *Lisez attentivement ces consignes de sécurité.*
- *Conservez le manuel de l'utilisateur pour pouvoir le consulter ultérieurement.*
- *Lisez la section Spécifications de ce manuel pour des informations détaillées sur l'environnement d'exploitation recommandé.*
- *L'appareil peut être utilisé à une température ambiante de 45°C avec entrée CC pour les série MVP-61; 35ºC avec entrée adaptateur pour la série MVP-61.*
- *Il est recommandé d'installer l'appareil dans des salles de technologie de l'information conformes à l'article 645 du National Electrical Code et à la NFPA 75.*
- *Pour éviter les chocs électriques et/ou d'endommager l'appareil:*
  - *Tenez l'appareil à l'écart de toute source d'eau ou de liquide.*
  - *Tenez l'appareil à l'écart d'une forte chaleur ou d'une humidité élevée.*
  - *Maintenez l'appareil correctement ventilé (n'obstruer ou ne couvrez pas les ouvertures de ventilation).*
  - *Utilisez toujours les réglages de tension et de source d'alimentation recommandés.*
  - *Installez et utilisez toujours l'appareil près d'une prise de courant facilement accessible.*
  - *Fixez le cordon d'alimentation (ne placez aucun objet sur le cordon d'alimentation).*
  - *Installez/fixez et utilisez l'appareil uniquement sur des surfaces stables et/ou sur les fixations recommandées.*
  - *Le cordon d'alimentation doit être connecté à une prise ou à une prise de courant avec mise à la terre.*

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- Si l'appareil ne doit pas être utilisé pendant de longues périodes, éteignez-le et débranchez-le de sa source d'alimentation
- *N'essayez jamais de réparer l'appareil, qui ne doit être réparé que par un personnel technique qualifié à l'aide d'outils appropriés*
- *Une batterie de type Lithium peut être fournie pour une alimentation de secours ininterrompue ou d'urgence.*



ATTENTION: Risque d'explosion si la pile est remplacée par une autre de type incorrect. Veuillez jeter les piles usagées de façon appropriée.

- *Cet équipement ne convient pas à une utilisation dans des lieux pouvant accueillir des enfants.*
- *L'appareil doit être entretenu par des techniciens agrees lorsque:*
- *Le cordon d'alimentation ou la prise est endommagé(e)*
- *Un liquide a pénétré à l'intérieur de l'appareil.*
- *L'appareil a été exposé à une forte humidité et/ou de la buée.*
- *L'appareil ne fonctionne pas ou ne fonctionne pas selon le manuel de l'utilisateur.*
- *L'appareil est tombé et/ou a été endommagé et/ou présente des signes évidents de dommage.*
- *Débranchez le cordon d'alimentation avant de desserrer les vis à oreilles et serrez toujours les vis à oreilles avec un tournevis avant de mettre le système en marche.*
- *Il est recommandé d'installer l'appareil uniquement dans une salle de serveurs ou une salle informatique où l'accès est:*
  - *Réservé au personnel de service qualifié ou aux utilisateurs familiarisés avec les restrictions appliquées à l'emplacement, aux raisons de ces restrictions et toutes les précautions requises*
  - *Uniquement autorisé par l'utilisation d'un outil, d'une serrure et d'une clé, ou d'un autre moyen de sécurité, et contrôlé par l'autorité responsable de l'emplacement.*

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	***RISQUE DE BRÛLURES*** ***Partie chaude!*** *Ne touchez pas cette surface, cela pourrait entraîner des blessures. Pour éviter tout danger, laissez la surface refroidir avant de la toucher.*

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Getting Service

Ask an Expert: http://askanexpert.adlinktech.com

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