Parker Automation

p/n YPM08123

ACR1200
Hardware Manual

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CHANGE NOTICE

ACR1200 Hardware Manual P/N PM08123 Version Change:
From: Version 1.03, Dated 6/30/2000
To: Version 1.04, Dated 12/3/2001

Page 5. Figure 1, ACR1200 Motherboard Outline.	Updated drawing to add pin 1 references and JP22-JP25 locations.
Page 13. Digital Output Sink/Source Select (JP20 and JP21)	Added sinking IC source to Table 2.4.
Page 18. RS-422/485 Config Jumpers	Updated MUX Flags setup table.
Page 29. Stepper Fuse (F1)	Corrected fuse reference designation.
Page 32. Digital I/O Power	Corrected fuse reference designation.
Page 33. Standalone Power	Corrected fuse reference designations.
Page 36. Technical Specification	Corrected operating temperature range and Digital I/O power requirements.

ACR1200 Hardware Manual P/N PM08123 Version Change:
From: Version 1.02, Dated 3/28/2000
To: Version 1.03, Dated 6/30/2000

Page 5. Figure 1, ACR1200 Motherboard Outline.	Updated drawing to reflect connector changes in Revision 2 of the PCB.
Page 25. Encoder Inputs (P1)	Updated connector from 26-Pin Mini D-Sub to 26-pin shrouded male header.
Page 28. Analog Input/Output (P2)	Updated connector from 26-Pin Mini D-Sub to 25-pin D-Sub female connector.
Page 30. Digital Inputs/Outputs (P3)	Updated connector from 36-Pin Mini D-Sub to 34-pin shrouded male header.
Page 31. Communications (P5)	Updated connector from 36-Pin Mini D-Sub to 34-pin shrouded male header.

CHANGE NOTICE

ACR1200 Hardware Manual P/N PM08123 Version Change:
From: Version 1.01, Dated 10/31/1999
To: Version 1.02, Dated 6/13/2000

Page 5. Figure 1a, ACR1200 Motherboard Outline.	Corrected connector reference designations. Added pin 1 markings to PWR1 and PWR2 connector.
Page 6. Figure 1b, Motherboard Outline.	Added new figure for right angle JP11-JP12 header.
Page 33. Table 2.19, ACR1200 Isolated Power Fuses	Corrected current rating from “4 Amps” to “2 Amps”.
Page 34. Table 2.21, ACR1200 Standalone Power Fuses	Corrected current rating from “2 Amps” to “4 Amps”.

ACR1200 Hardware Manual P/N PM08123 Version Change:
From: Version 1.00, Dated 9/30/1999
To: Version 1.01, Dated 10/31/1999

Page 6, 7. Figure 1b, 1c. Motherboard Outline.	Added new version of outline for right angle JP11-JP12 header.
Page 21. Figure 4, ACR1200 RS-422/ RS-485 Interface Schematic.	Corrected jumpers.

ACR1200 Hardware Manual P/N PM08123 Version Change:
Version 1.00, Dated 9/30/1999, Released

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FIGURES

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INTRODUCTION

This document provides hardware connection information for the Acroloop ACR1200 motion controller.

NOTE: This document applies to ACR1200 PCB Revision 2 and above. For Revision 1 boards, please contact Acroloop for correct documentation.

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CHAPTER 1

ACR1200 MOTHERBOARD HARDWARE SETUP

CHAPTER 1 OVERVIEW

This section contains diagrams of the jumpers and switches on the ACR1200 motherboard.

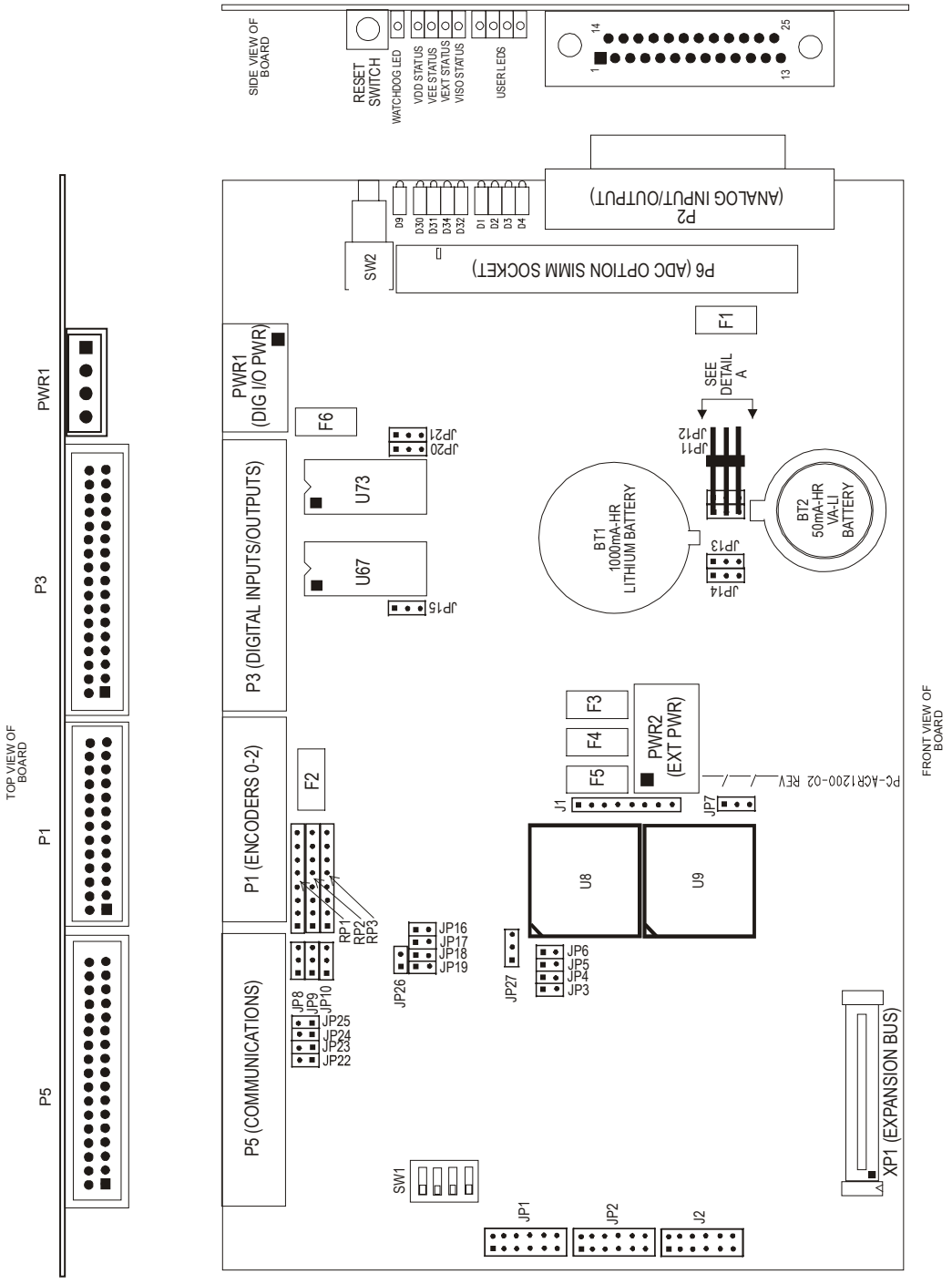
Encoder pull-up jumpers must be set correctly based on the types of encoders being used. Failure to set these jumpers correctly may cause damage to the encoders or to the receivers on the controller card.

There are no analog adjustment “pots” on the board. All analog gain and offset is under software control. The analog outputs must be wired to differential control signal inputs on a servo amplifier. The DAC outputs provide an analog control voltage of ±10 volts.

Stepper outputs provide open-collector step and direction signals. There are no pull-up resistors provided on the Stepper outputs.

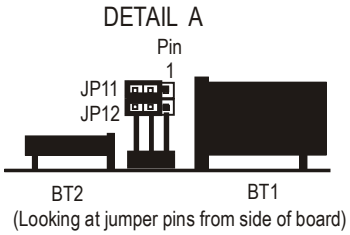
DAC/Stepper Output configuration is set at the factory and is not field configurable.

Factory default jumper settings for the ACR1200 motherboard are highlighted within the following jumper tables.



NOTE: Square pin indicates Pin 1.

Figure 1.a. ACR1200 Motherboard Outline



NOTE: Square pin indicates Pin 1.

Figure 1.b. ACR1200 Motherboard Outline Detail A – JP11-JP12 Right Angle Header

ACR1200 MOTHERBOARD SWITCHES

Serial Communication Card Selection Switch (SW1)

Serial communication via the COM1 and COM2 communication ports on the ACR1200 Motherboard is performed with multiple cards using different ACR1200 card numbers. The following table shows how the switch positions relate to the ACR1200 card number.

Note that Switch 4 should be left in the "OFF" position, unless using the Flash Bypass Mode of operation. Flash Bypass Mode is selected when the user does not want to load the program information from flash at power-up or reset. Serial communication via the COM1 and COM2 communication ports on the ACRCOMM module will recognize the card as Card Number 15. However, the card should be placed back to a valid card number during normal operation.

Refer to Figure 1 for switch location.

Card Number	SW1 Settings				
	4	3	2	1	Function
0	OFF	OFF	OFF	OFF	Serial Communications
1	OFF	OFF	OFF	ON	Serial Communications
2	OFF	OFF	ON	OFF	Serial Communications
3	OFF	OFF	ON	ON	Serial Communications
4	OFF	ON	OFF	OFF	Serial Communications
5	OFF	ON	OFF	ON	Serial Communications
6	OFF	ON	ON	OFF	Serial Communications
7	OFF	ON	ON	ON	Serial Communications
8-14	RESERVED				
15	ON	ON	ON	ON	Flash Bypass Mode

Table 2.1 ACR1200 Serial Communication Card Number Select

ACR1200 MOTHERBOARD JUMPERS

Jumper Table List

The following is a list of the jumper functions on the ACR1200 motherboard:

JUMPER	JUMPER FUNCTION
JP1	COM1 RS-422/RS-485 Configuration (Page 18)
JP2	COM2 RS-422/RS-485 Configuration (Page 18)
JP3	COM1 and COM2 Autobaud Detect Enable (Page 22)
JP4	Reserved
JP5	Reserved
JP6	Reserved
JP7	Firmware Eprom Size Select (Page 15)
JP8	ENC0 Pull-up to Voltage Select (Page 9)
JP9	ENC1 Pull-up to Voltage Select (Page 9)
JP10	ENC2 Pull-up to Voltage Select (Page 9)
JP11	Battery BT1 Enable/Disable (Page 17)
JP12	Battery BT2 Enable/Disable (Page 17)
JP13	User Memory Battery Chip Enable Select (Page 16)
JP14	User Memory Battery Power Select (Page 16)
JP15	Digital Input Sinking/Sourcing Select (Page 11)
JP16	COM1 Half Duplex Select (Page 18)
JP17	COM1 Half Duplex Select (Page 18)
JP18	COM2 Half Duplex Select (Page 18)
JP19	COM2 Half Duplex Select (Page 18)
JP20	Digital Output Sinking/Sourcing Select (Page 13)
JP21	Digital Output Sinking/Sourcing Select (Page 13)
JP22	COM1 RS-422 Termination Resistor Select (Page 21)
JP23	COM1 RS-422 Termination Resistor Select (Page 21)
JP24	COM1 RS-422 Termination Resistor Select (Page 21)
JP25	COM1 RS-422 Termination Resistor Select (Page 21)
JP26	Factory Install -- DUART Select (Page 23)
JP27	Factory Install -- DUART Select (Page 23)
J1	Factory Programming Header**
J2	Factory Test Header**

** Connecting external signals to these headers my cause board failure or damage to IC's.

Refer to Figure 1 for locations.

ACR1200 MOTHERBOARD JUMPERS

Encoder Pull-up Select Jumpers (JP8, JP9, JP10)

The ACR1200 is capable of handling various types of incremental open-collector and line driver encoders. Care must be taken to setup each channel to match the encoder type as described below:

The encoder options for the ACR1200 are selectable as follows:

Encoder Options	Encoders Supplied
None	Not Applicable
3	1, 2, and 3

Open Collector Encoders:

When using open-collector encoders, the encoder channels must be pulled to either +5 or +12 volts, depending upon the application. Pulling up to +12 volts provides higher noise immunity, but causes a slower response time. For high frequency applications (encoder rates higher than 1 megahertz) the +5 volt pull-up section may be necessary.

Line Driver Encoders:

When using line driver (or balanced pair) encoders, the corresponding resistor pack should be removed from it's socket. Leaving the resistor pack in the socket can cause faulty encoder operation and possibly severe encoder damage. Optionally, the resistor pack can be replaced with an 8-pin isolated resistor pack to supply termination resistance for the balanced signal pairs.

Pull-up Selection:

The following table lists the pull-up jumper settings for each encoder:

☠ WARNING

Wiring a line driver encoder with the pull-up selected to +12 volts will permanently damage the encoder.

Encoder Pull-up Select Jumpers, continued

Encoder Pull-Up Jumpers				
Encoder	Resistor	Jumper	+5V	+12V
0	RP1	JP8	1-2	2-3
1	RP2	JP9	1-2	2-3
2	RP3	JP10	1-2	2-3

Table 2.2 ACR1200 Encoder Pull-Up Jumpers

Refer to Figure 1 for jumper location.

ACR1200 MOTHERBOARD JUMPERS

Digital Input Reference Select (JP15)

This jumper selects the reference voltage to be used for the optically-isolated inputs. The reference voltage selected applies to all inputs; there are no combinations available.

Isolated voltage (VEXT) refers to +24VDC

WARNING

Wiring VEXT with the incorrect voltage will permanently damage the Digital I/O circuitry. The isolated voltage (VEXT) is selected as +24VDC.

Refer to Figure 1 for jumper location.

Digital Input Reference Jumper			
Input Type	Reference Voltage	JP15	User Supplies
Sinking	Reference Inputs to +24VDC Isolated Voltage (VEXT)	1-2	Path to GEXT
Sourcing	Reference Inputs to Isolated Common (GEXT)	2-3	Path to VEXT

Table 2.3 ACR1200 Digital Input Reference Jumper

USER CIRCUIT	JUMPER POSITIONS
Sink Input  	JP15-1 to JP15-2
Source Input +24VDC Isolated Voltage (VEXT)  	JP15-2 to JP15-3

Figure 2. ACR1200 Digital Input User Circuit

ACR1200 MOTHERBOARD JUMPERS

Digital Output Sink/Source Select Jumpers (JP20 and JP21)

These jumpers are set at the factory based on the type of the output drivers, IC's U67 and U73. The selected type of the output driver applies to all outputs; there are no combinations available.

Isolated voltage (VEXT) refers to +24VDC.

☠ WARNING

Wiring VEXT with the incorrect voltage will permanently damage the Digital I/O circuitry. The isolated voltage (VEXT) is +24VDC.

Selecting the wrong jumper settings for the type of output drivers installed on the board will permanently damage the output driver IC's (U67 and U73). The output drivers are installed at the factory, based on the Sinking or Sourcing Option selected when ordering the board.

Refer to Figure 1 for jumper location.

Digital Output Sink/Source Select Jumpers				
Output Type	Output Driver IC Type Installed (U67,U73) (See Warning Above)	JP20	JP21	User Supplies
Sink	Motorola / ST Micro ULN2803A	1-2	1-2	Path to VEXT
Source	Allegro UDN2981A	2-3	2-3	Path to GEXT

Table 2.4 ACR1200 Digital Output Sink/Source Select Jumper

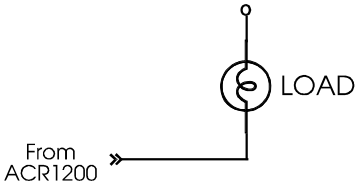
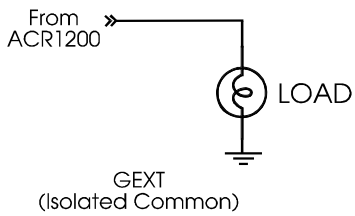
USER CIRCUIT	JUMPER POSITIONS
Sink Output +24VDC Isolated Voltage (VEXT)  	JP20-1 to JP20-2 JP21-1 to JP21-2
Source Output  	JP20-2 to JP20-3 JP21-2 to JP21-3

Figure 3. ACR1200 Digital Output User Circuit

ACR1200 MOTHERBOARD JUMPERS

EPROM Size Select Jumper (JP7)

This jumper is set at the factory to match the EPROM size required for the current firmware version. This jumper should not be set by the user.

EPROM Size Jumper		
Memory	Part No.	JP7
128K x 32	27C2048	1-2
256K x 32	27C4096	2-3

Table 2.5 ACR1200 EPROM Size Select Jumper

Refer to Figure 1 for jumper location.

ACR1200 MOTHERBOARD JUMPERS

Battery Back-Up Select Jumpers (JP13 and JP14)

These two jumpers allow for disabling and enabling of the battery back-up function on the ACR1200 motherboard, along with the Battery Enable Jumpers, JP11 and JP12.

When the jumpers are set to "Battery Function Enabled", user programs on the board are retained when power is removed (and batteries are enabled – see Battery Enable Jumpers). When the jumpers are set to "Battery Function Disabled", user programs on the board are not retained when power is removed.

Battery Back-up Jumpers		
Battery Function	JP13	JP14
Battery Function Disabled	1-2	1-2
Battery Function Enabled	2-3	2-3

Table 2.6 ACR1200 Battery Back-Up Enable Jumpers

Refer to Figure 1 for jumper location.

ACR1200 MOTHERBOARD JUMPERS

Battery Enable Jumpers (JP11 and JP12)

These two jumpers enable or disable the batteries on the ACR1200 Motherboard. A primary 1000mA-Hr Lithium (LI) coin battery is provided on the board (BT1 – User-Replaceable). A 50mA-Hr rechargeable Vanadium-Lithium (VA-LI) battery is also provided as a short-term secondary back-up source (BT2 – Factory Replaceable Only). This allows for continued back-up of the user memory during replacement of the primary battery.

The factory default jumper settings are set to disconnect the batteries from the circuit. This prevents the battery power from draining during shipping. The jumpers must be moved to the Battery Load Enable positions for normal battery back-up operation.

Battery Selection Jumpers		
Battery Type/Function	JP11	JP12
Battery Load Enable (BT1 and BT2 installed)	1-2	1-2
Battery Load Enable (BT1 only installed)	1-2	2-3
Battery Load Disable	2-3	2-3

Table 2.7 ACR1200 Battery Selection Jumpers

Refer to Figure 1 for jumper location.

ACR1200 MOTHERBOARD JUMPERS

RS-422/485 Configuration Jumpers (JP1, JP2, JP16, JP17, JP18, JP19)

The ACR1200 serial communication interface is software configurable. At power-up, the default COM1/COM2 communications mode is RS-232.

For ACR1200 boards, reconfiguration of the communications ports to RS-422/RS-485 must be performed via an RS-232 port.

If one of the serial ports is a dedicated RS-232 port, reconfiguration of the second port may be accomplished at power-up (or at any time).

If both ports are to be configured to RS-422/RS-485 mode, the following must be performed:

1. Open serial communication to one of the ports via RS-232.
2. Load a PBOOT program containing the desired communication flags configuration for COM1 and COM2 ports.

This will configure the serial ports to the desired mode of operation at power-up. If a different communication mode is then required, disabling the User-Memory battery-backup batteries via jumpers or a issuing a BRESET command (or issuing a FLASH ERASE command, if the programs are stored in flash memory) will set the communications modes back to default (RS-232) at the next power-up sequence.

RS-422/485 Configuration Jumpers, continued

The following tables show the configuration schemes for the ACR1200 board. Refer to the User's Guide manual, COM1/COM2 Stream Flags, Appendix B, for bit flag details. Refer to the following page for hardware jumper details.

MUX Flags, Set-up communication type flags:

MUX1 FLAG	MUX0 FLAG	COMM FUNCTION
CLR (0)	CLR (0)	Not Used
CLR (0)	SET (1)	RS-232 (Default)
SET (1)	CLR (0)	RS-422/RS-485
SET (1)	SET (1)	Not Used

RECEIVE/TRANSMIT Flags, RS-485 flow control flags:

RECEIVE FLAG	TRANSMIT FLAG	COMM FUNCTION
CLR (0)	CLR (0)	Use for RS-485 Operation: (Default) Receiver Enabled Transmitter Disabled
CLR (0)	SET (1)	Not Used: Receiver Enabled Transmitter Enabled
SET (1)	CLR (0)	Not Used: Receiver Disabled Transmitter Disabled
SET (1)	SET (1)	Use for RS-485 Operation Receiver Disabled Transmitter Enabled

RS-422/485 Configuration Jumpers, continued

These jumpers selections show some of the standard interface configurations for the RS-422/RS-485 output control. Refer to the following figure for a schematic of the RS-422/RS-485 interface.

Standard RS-422/485 Interface Jumpers Examples		
Interface Function	COM1 Jumpers	COM2 Jumpers
RS-422 Full Duplex: Drivers and Receivers are enabled at all times. 4-Wire Interface.	JP1-1 to JP1-2 JP1-3 to JP1-4 JP16 Out JP17 Out	JP2-1 to JP2-2 JP2-3 to JP2-4 JP18 Out JP19 Out
RS-485 Half Duplex: Drivers and Receivers are enabled and disabled by the user via COM1/COM2 RXD/TXD Transmit Enable flags. 2-Wire Interface.	JP1-1 to JP1-2 JP1-3 to JP1-4 JP16 In JP17 In	JP2-1 to JP2-2 JP2-3 to JP2-4 JP18 In JP19 In

Table 2.8 ACR1200 RS-422/485 Configuration Jumpers

Refer to Figure 1 for jumper location.

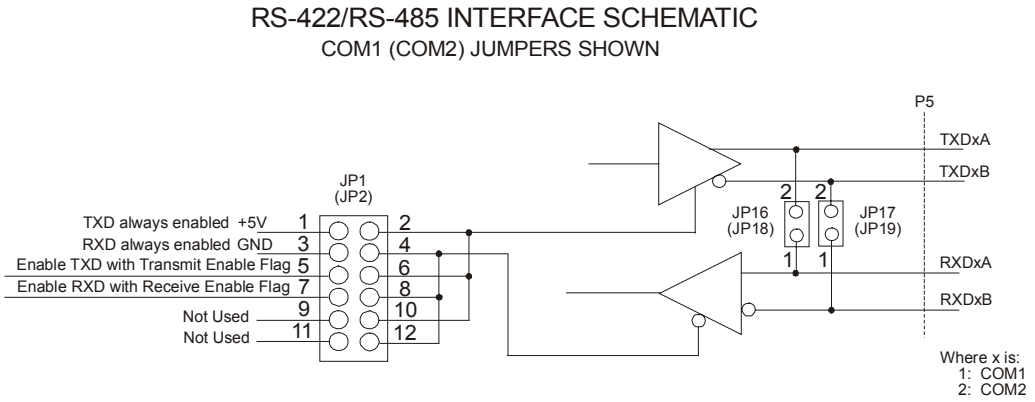


Figure 4. ACR1200 RS-422/RS-485 Interface Schematic

ACR1200 MOTHERBOARD JUMPERS

RS-422 Communication Ports Line Terminator Jumpers (JP22, JP23, JP24, JP25)

These jumpers provide 120 ohm termination resistors for the RS-422 signals.

Communication Ports Termination Jumpers			
Signal	Jumper	Termination	No Termination
RXD1A/RXD1B	JP22	Jumper In	Jumper Out
TXD1A/TXD1B	JP23	Jumper In	Jumper Out
RXD2A/RXD2B	JP24	Jumper In	Jumper Out
TXD2A/TXD2B	JP25	Jumper In	Jumper Out

Table 2.9 ACR1200 RS-422 Termination Jumpers

Refer to Figure 1 for jumper location.

Autobaud Detect Jumper (JP3)

This jumper enables or disables the autobaud detect feature of the serial communications channels on the ACR1200 Motherboard. This jumper works in conjunction with the COM1 Startup Mode (P7013) and COM2 Startup Mode (P7029) parameters listed in the User's Guide under Miscellaneous Parameters P6912-P7029.

When the Startup Enable bit is not set (0 - default) in the COM1/2 Startup Mode parameters, the jumper is ignored and Autobaud detect is always enabled. The default operation of the COM1 and COM2 ports is Autobaud Detect enabled.

When the Startup Enable bit is set (1) in the COM1/2 Startup Mode parameters, the jumper defines the Autobaud Detect function as listed in the following table.

Autobaud Detect Jumper	
Function	JP3
Autobaud Detect Enabled	ON
Autobaud Detect Disabled	OFF

Table 2.10 ACR1200 Autobaud Detect Jumper

Refer to Figure 1 for jumper location.

ACR1200 MOTHERBOARD JUMPERS

DUART Select Jumpers (JP26 and JP27)

These jumpers are used by the factory to select the type of DUART (U54) installed on the ACR1200.

DUART Select Jumpers (Factory Set)		
DUART TYPE	JP26	JP27
16C552	IN	1-2
Other (For future applications)	OUT	2-3

Table 2.11 ACR1200 DUART Select Jumper

Refer to Figure 1 for jumper location.

ACR1200 MOTHERBOARD HARDWARE WIRING

This section contains diagrams of the connectors on the ACR1200 motherboard.

Before optically-isolated digital inputs and outputs can be used, the card must be connected to an external +24V DC power supply. This connection is made at the PWR1 connector and is fused on-board at 2 amps to protect the controller card.

☠ WARNING

Wiring VEXT with the incorrect voltage will permanently damage the Digital I/O circuitry. The isolated voltage (VEXT) is +24VDC.

Encoder Inputs (P1)

There is one 26-pin connector provided on the ACR1200 for encoder feedback. The 26-pin connector provides up to three (3) axes of encoder feedback (Encoders 0 thru 2). Refer to Figure 1 for connector location.

Note: P1 is a 26-pin shrouded male header

P1			
Usage	**Pin**	**Pin**	**Usage**
CHA0	1	2	CHA0'
CHB0	3	4	CHB0'
MRK0	5	6	MRK0'
EVCC	7	8	GND
CHA1	9	10	CHA1'
CHB1	11	12	CHB1'
MRK1	13	14	MRK1'
EVCC	15	16	GND
CHA2	17	18	CHA2'
CHB2	19	20	CHB2'
MRK2	21	22	MRK2'
EVCC	23	24	GND
N.C.	25	26	N.C.

Table 2.12 ACR1200 Encoder Input Connector P1

Encoder Inputs (P1), continued.

The ACR1200 can accept any feedback device that supplies either a +5V or +12V differential signal to the ACR1200. The most common type of device is a differential encoder. Refer to the table below for common encoder setups.

Encoder Type	ACR1200 Pull-up/Jumper Setting	Length of Cable/Type
Differential Line Driver (+5 Volt Outputs)	Remove Pull-ups	100 ft. (Beldon 9330 Shielded Twisted Pair)
Open Collector Driver (No Pull-ups on Encoder)	Install Pull-ups and Jumper to +12V	75 ft. (Beldon 9330 Shielded Twisted Pair)
Open Collector Driver (With Pull-ups to +5 V on Encoder)	Install Pull-ups and Jumper to +5V	50 ft. (Beldon 9330 Shielded Twisted Pair)
TTL Driver (+5 Volt Outputs)	Remove Pull-ups	50 ft. (Beldon 9330 Shielded Twisted Pair)

When using a single-ended encoder (an encoder without the A-, B-, or Z- outputs), additional pull-ups and pull-down resistors must be added externally to the ACR1200 board in order for the ACR1200 to read the encoder signals. Warning: This is not a recommended mode of operation. Noise immunity is significantly reduced.

Refer to the ACR1200 Typical Connection Diagram section of this manual for details on wiring a single-sided encoder to the ACR1200.

Encoder Inputs (P1), continued.

A fused +5VDC Encoder Output (EVCC) is available on the P1 connector for use with wiring the encoders. The maximum recommended output rating for EVCC is 100 milliamps per encoder (300 milliamps, maximum).

See Figure 1 for fuse F2 location.

Encoder +5VDC Output Fuse			
Fuse	Circuit	Amps	Littelfuse Part No.
F2	EVCC	0.750	154.750

Table 2.13 ACR1200 Encoder Power Fuses

Analog Input/Output (P2)

The analog input/output connections are made through a 25-pin D-style connector on the side of the ACR1200 motion controller. Refer to Figure 1 for connector location.

Note: P2 is a 25-pin D-Sub right angle female connector.

P2				
Definition	**Pin**	**Pin**	**Definition**	**Module**
ASIG-0	1	14	AGND-0	None
STEP-0	2	15	DIR-0	
LCUR-0	3	16	SVCC	
ASIG-1	4	17	AGND-1	
STEP-1	5	18	DIR-1	
LCUR-1	6	19	SVCC	
AIN-0	7	20	AIN-1	ADC Module P6
AIN-2	8	21	AIN-3	
AIN-4	9	22	AIN-5	
AIN-6	10	23	AIN-7	
WD-COM	11	24	WD-NO	None
WD-COM	12	25	WD-NC	
AGND	13			ADC Module

Table 2.14 ACR1200 Analog I/O Connector

Analog Input/Output (P2), continued

A fused +5VDC Stepper Output (SVCC) is available on the P2 connector for use with wiring the Stepper outputs. The maximum recommended output rating for SVCC is 250 milliamps.

See Figure 1 for fuse F1 location.

Stepper +5VDC Output Fuse			
Fuse	Circuit	Amps	Littelfuse Part No.
F1	SVCC	0.500	154.500

Table 2.15 ACR1200 Stepper Power Fuses

Digital Inputs / Outputs (P3)

There is one 34-pin connector provided on the ACR1200 for digital I/O interface. The 34-pin connector is used for the 16 Digital Inputs and 16 Digital Outputs. Refer to Figure 1 for connector location.

Note: P3 is a 34-pin shrouded male header.

P3			
Usage	**Pin**	**Usage**	**Pin**
INP-00	1	INP-01	2
INP-02	3	INP-03	4
INP-04	5	INP-05	6
INP-06	7	INP-07	8
INP-08	9	INP-09	10
INP-10	11	INP-11	12
INP-12	13	INP-13	14
INP-14	15	INP-15	16
N/C	17	OUT-32	18
OUT-33	19	OUT-34	20
OUT-35	21	OUT-36	22
OUT-37	23	OUT-38	24
OUT-39	25	OUT-40	26
OUT-41	27	OUT-42	28
OUT-43	29	OUT-44	30
OUT-45	31	OUT-46	32
OUT-47	33	N/C	34

Table 2.16 ACR1200 Digital I/O Connector

Communications (P5)

There is one 34-pin connector provided on the ACR1200 communications board for the 2 serial and 1 parallel communications ports. The two serial ports, COM1 and COM2, can be individually configured as RS-232 or RS-422/485 interfaces. Configuration of the COM ports is software selectable by the user.

The following diagram shows the connections for the 3 communications ports. Refer to Figure 1 for connector location.

Note: P5 is a 34-pin shrouded male header.

P5			
Usage	**Pin**	**Usage**	**Pin**
RXD1	1	TXD1	2
GND	3	MUX1	4
TXD1A	5	TXD1B	6
RXD1A	7	RXD1B	8
RXD2	9	TXD2	10
GND	11	MUX2	12
TXD2A	13	TXD2B	14
RXD2A	15	RXD2B	16
STB	17	AFD	18
ERR	19	INIT	20
SLIN	21	GND	22
PD0	23	PD1	24
PD2	25	PD3	26
PD4	27	PD5	28
PD6	29	PD7	30
ACK	31	BUSY	32
PE	33	SLCT	34

Table 2.17 ACR1200 Communications Connector

Digital I/O Power (PWR1 and P4)

PWR1 is the primary connection for the user supplied voltage for the Digital Inputs and Digital Outputs and should be wired to VEXT as shown in the table below. Refer to Figure 1 for connector location.

P4 is a Molex-style secondary connection for user supplied voltage that is reserved for future expansion.

Isolated voltage (VEXT) refers to +24VDC.

☠ WARNING

Wiring VEXT with the incorrect voltage will permanently damage the Digital I/O circuitry. The isolated voltage (VEXT) is +24VDC.

PWR1 is a 4-pin male Weidmuller plug. PWR1 is the primary connector for user connection. PWR1 connections are shaded for clarity.

PWR1 and P4 Isolated Power Connector		
Usage	**PWR1 Pin**	**P4 Pin (Reserved)**
Isolated Common (GEXT)	1	4
Isolated Common (GEXT)	2	3
Isolated Voltage (VEXT)	3	2
Isolated Voltage (VEXT)	4	1

Table 2.18 ACR1200 Isolated Power Connector

Isolated Power Fuse			
Fuse	Circuit	Amps	Littelfuse Part No.
F6	VEXT	2	154.002

Table 2.19 ACR1200 Isolated Power Fuses

Standalone Power (PWR2)

PWR2 is the connection on the ACR1200 communications board for the main power supply when the card is used as a stand-alone board. Refer to Figure 1 for connector location.

Note: PWR2 is a 4-pin male Weidmuller plug.

PWR2 Stand-alone Power Connector	
Usage	**Pin**
Stand-alone GND	1
Stand-alone +5V	2
Stand-alone -12V	3
Stand-alone +12v	4

Table 2.20 ACR1200 Standalone Power Connector

Stand-alone Power Fuses			
Fuse	Circuit	Amps	Littelfuse Part No.
F5	+5V	4	154.004
F4	-12V	0.25	154.250
F3	+12V	0.25	154.250

Table 2.21 ACR1200 Standalone Power Fuses

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CHAPTER 2

TECHNICAL SPECIFICATIONS

ACR1200 TECHNICAL SPECIFICATION

ITEM	SPECIFICATION
CPU:	32 Bit Floating Point DSP @ 40 MHz
Processor Type:	Texas Instruments TMS320C32
Board Size:	8”W x 5H”
Axis Configuration:	2 axes configurations
Weight:	8.5 ounces
Operating Temperature:	0°C to 50°C (32°F to 122°F)
Humidity:	0 to 95%, Non-Condensing
Power Consumption:	+5 VDC +/- 0.2VDC @ 1.5 Amps +12 VDC +/- 0.5VDC @ 0.150 Amps -12 VDC +/- 0.5VDC @ 0.150 Amps Note: Power consumption does not include any additional power required for external components (Encoders, Stepper Outputs, etc.).
Encoder Inputs:	Up to 3 per card Differential Quadrature Encoder Open-Collector or Line Driver 0.1 Hz to 8 MHz Frequency Range 100mA maximum power source per channel
DAC/Stepper Outputs:	Up to 2 per card on-board. DAC Outputs: +/- 10VDC @ 5mA, maximum Programmable Output (DAC GAIN, DAC OFFSET) 16 Bit Resolution Single Ended input amplifiers can be used if caution is used to avoid ground loops. Stepper Outputs: Open-Collector Step, Direction, and Low Current Outputs (no pull-up resistors on-board); Fused +5VDC Stepper Output available on P2 connector up to 250 mA. Step Output Frequency : 0 to 6 KHz, pulse width 167us 6 KHz to 4 MHz, approx. 50% duty cycle

ACR1200 TECHNICAL SPECIFICATION, continued

ITEM	SPECIFICATION
Feedback Types:	Any Differential 5VDC or 12VDC including: - Quadrature Encoder - Glass Scales - Analog (Optional)
Watchdog Relay:	+24VDC @ 1.0 A Single Pole – Double Throw (SPDT) Hardwire through P2 analog header
External I/O Power Supply Requirements:	+24 VDC (+3/-6VDC) @ 2A
Digital Inputs:	16 Optically Isolated (standard) @ External Voltage Supplied Sinking or Sourcing Available Activates on 10mA per input
Digital Outputs:	16 Optically Isolated (standard) @ External Voltage Supplied Output Loads: 16 Outputs @ 50 mA continuously, each or Up to 6 Outputs @ 125mA continuously, each, distributed across the two (2) output drivers, as follows: up to 3 between OUT32 and OUT39 up to 3 between OUT40 and OUT47 Open Collector Sinking or Sourcing Type Available
A/D Inputs (SIMM Board Option):	Up to 8 single-ended or up to 4 differential 12 or 16 bit resolution Configurable for various analog inputs 9 microsecond conversion time
Communications	PC-Bus: Not Available COM1, COM2, and LPT standard Simultaneous communications on all 3 ports
Serial Communications:	2 ports standard (COM1, COM2) Configurable RS-232 or RS-422/485 Automatic Baud Detect (300 Hz – 38.4 KHz)

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CHAPTER 3

ACR1200 MECHANICAL DRAWINGS

ACR1200 MECHANICAL DIMENSIONS

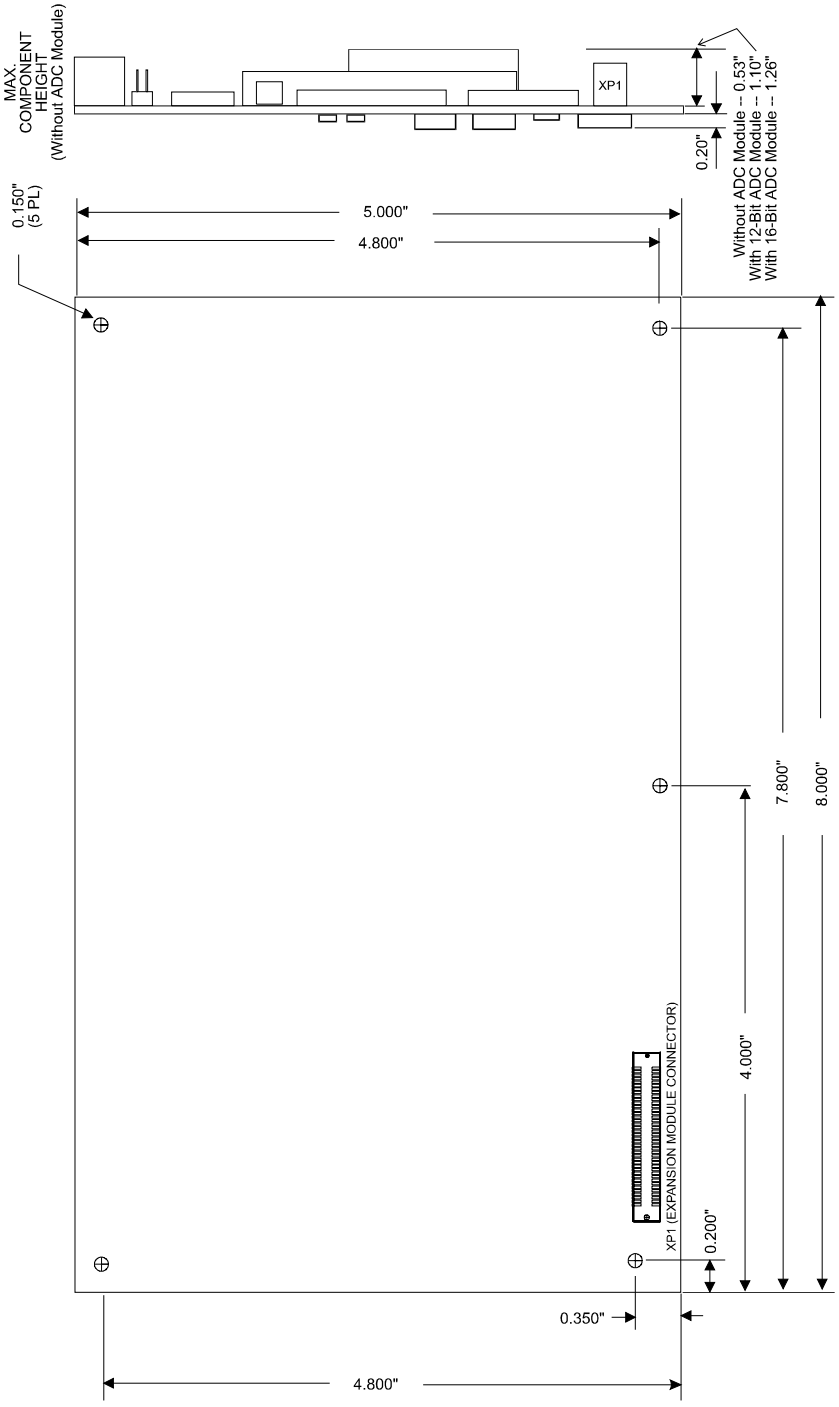

Figure 5. ACR1200 Mechanical Dimensions

ACRIO/ACR1200 BOARD STACKING EXAMPLES

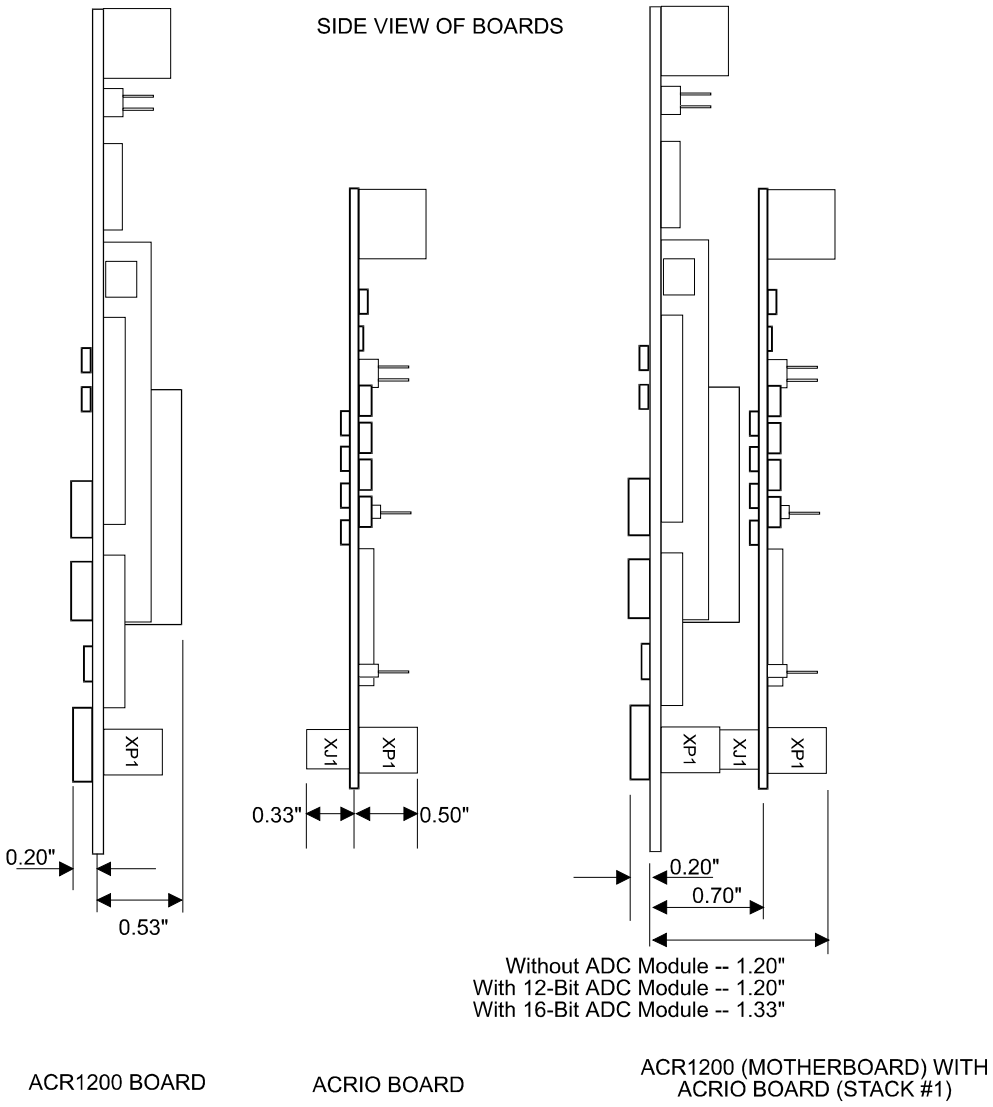

Figure 6. ACR1200 Board Stacking Mechanical Dimensions Examples

ACR1200 TYPICAL CONNECTION DIAGRAMS

The following schematic sheets represent some typical connection and wiring diagrams for the ACR1200 Motherboard and associated plug-in modules:

For electronic media, refer to the typical connection drawing file, ACR1200 TYPICAL CONNECTIONS.PDF, supplied separately on the AMCS CD P/N CD2000 under the \DOCS directory.