

Test Instrument Module System

USB Stepper Motor Controller

Model No: TIMS-0201

Design Specification

**Review Copy
Not Released**

Revision History

ECO	Revision	Change Description	Date	Initial
	1.0	Initial Draft	4/29/2004	GSH
	2.0	Significant Updates	10/22/2004	GSH
	01	Significant changes	11/10/2004	GSH

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1 INTRODUCTION

This specification provides the necessary information to design, develop, manufacture, use and maintain the model TIMS-0201, Stepper Motor Controller test instrument module.

2 SCOPE

3 CONTACT INFORMATION

3.1 SALES AND SUPPORT

WireWorks West, Inc.
965 Mission Street, Suite 600
San Francisco, CA 94103

415-348-1400 Office
415-348-1414 Fax
415-348-1408 Technical Support
800-755-1400 Toll Free Sales

www.wireworkswest.com

4 REFERENCE DOCUMENTS

<i>Description</i>	<i>Doc. No</i>	<i>Company/Author</i>	<i>Rev/Date</i>
PIC18F252 Data Sheet		Microchip	
FTD2XX Programmer's Guide	D2XXPG Ver 2.01	Future Technology Devices International, Ltd.	
SAMCOM		WireWorks West	
LH43-100 Mechanical	77240 Drw_LH43-100[1].pdf	PacTec Enclosures	A
DC Power Jack, PJ-202A	PJ-202A.DWG	CUI, Inc.	

5 MODULE SPECIFICATIONS

5.1 GENERAL DESCRIPTION

The functions of this module are:

- Provide half-step control of 2-phase stepper motors.
- Motors using up to 24 VDC and 1A per winding.
- Provide digital inputs for clockwise (CW) and counter clockwise (CCW) stop limits, and a home position.
- Incorporate Field Re-programmable Logic devices to facilitate rapid customization to meet specific requirements.

5.2 FUNCTIONAL DESCRIPTION

5.2.1 Stepper Motor Drive

The stepper motor drive circuit is provided using two Unitrode (Texas Instruments) UC3717 integrated circuit devices. Blah blah blah.

5.2.2 External Limit Position Inputs

The interface connector provides +5V and ground to external user circuitry, typically switches. Three input lines are monitor for a low level input to effect a motion stop. Blah blah blah.

(not yet implemented)

5.2.3 User Control Interface

The user control interface is performed through a USB 1.1/2.0 Full Speed connection.

5.2.4 Module Power

The module's +5V logic power is supplied through the USB interface. Stepper motor power is supplied from an external power supply through a 2.1mm connector.

5.3 ELECTRICAL SPECIFICATIONS

5.3.1 Module Input Power

Parameter	Symbol	Min	Typ	Max	Unit	Condition/Note
Voltage	VDD	4.75	5	5.25	VDC	Via USB J1
Current	IDD			500	mA	

5.3.2 Motor Input Power

Parameter	Symbol	Min	Typ	Max	Unit	Condition/Note
Voltage	VSM	10	24	40	VDC	J2
Current	ISM			2	A	

5.3.3 Stepper Motor Drive Output

Parameter	Symbol	Min	Typ	Max	Unit	Condition/Note
						per Unitrode Spec.

5.4 MECHANICAL SPECIFICATIONS

5.4.1 Enclosure

Parameter	Symbol	Min	Typ	Max	Unit	Condition/Note
Size	Height Width Length		1.250 4.500 3.000		Inches Inches Inches	Max Excludes Feet and Connector protrusion
Weight			5		Ounces	

PacTec Enclosures model LH43-100

5.4.2 Stepper Motor Interface Connector (J3)

Pin No	Signal	Comment
1	Winding A – Phase B	
9	Winding A – Center Tap	Not Connected – Reserved for Future Use
2	Winding A – Phase A	
10	Winding B – Phase B	
3	Winding B – Center Tap	Not Connected – Reserved for Future Use
11	Winding B – Phase A	
4	GND	
12	DIO-0	
5	DIO-1	
13	DIO-2	
6	DIO-3	
14	DIO-4	
7	DIO-5	
15	+5V thru 120 Ohms	
8	GND	

DB15S

5.4.3 USB Interface Connector (J1)

<i>Pin No</i>	<i>Signal</i>
1	+5V
2	D(-)
3	D(+)
4	GND

USB Type-B

5.4.4 Motor Power Interface Connector (J2)

<i>Pin No</i>	<i>Signal</i>
1	+V
2	GND
3	na

2.1mm, CUI, Inc. model number PJ-102A (PJ-202A for pilot production lot)

5.5 ENVIRONMENTAL SPECIFICATIONS

<i>Parameter</i>	<i>Symbol</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>	<i>Condition/Note</i>
Temperature		0		70	C	
Humidity			tbd		%	Non-Condensing
Altitude				10,000	ft	
Airflow			tbd			No Fans

6 REGULATORY REQUIREMENTS

6.1 SAFETY REQUIREMENTS

6.1.1 UL

6.1.2 CSA

6.2 EMISSIONS REQUIREMENTS

6.2.1 FCC

6.2.2 CE

6.3 AGENCY REQUIREMENTS

6.3.1 UL

6.3.2 TUV

6.4 LABELING REQUIREMENTS



7 MODULE CONTROL

7.1 LEVEL-1 PROTOCOL, PHYSICAL LAYER

7.2 LEVEL-2 PROTOCOL, DATA LINK LAYER

7.3 LEVEL-3 PROTOCOL, APPLICATION LAYER