SBI

Serial Bus Interface

OPERATION MANUAL
SBI001b

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TABLE OF CONTENTS

GENERAL DESCRIPTION 3
1.1 INTRODUCTION 3
1.2 SERIAL BUS INTERFACE MODELS 3

SPECIFICATIONS 4
2.1 GENERAL SPECIFICATIONS 4
2.2 MATING CONNECTORS 4

INSTALLATION 4
3.1 RS-422 INTERFACE 4
3.2 RS-232 INTERFACE 5
3.3 HOW POWER IS CONFIGURED 5
3.3.1 Supplying Power From RS-422 Device 5
3.3.2 Supplying Power From RS-232 Device 5
3.3.3 Supplying Power Through JM3 6
3.4 CONFIGURING FOR DTE AND DCE DEVICES 6
3.4.1 Standard SBI Interface to PMC 6

GENERAL DESCRIPTION

1.1 INTRODUCTION

ORMEC's Serial Bus Interface (SBI) is a P.C. board module (2.1" x 4.1") which converts RS-232 signals to RS-422 and allows products that support RS-232 to enjoy the inherent advantages of RS-422 communications.

The major difference between RS-232 and RS-422, standards that define the electrical interface for digital communication, is that RS-422 utilizes a balanced differential interface rather than the single-ended interface implemented by RS-232. Balanced differential communications allows RS-422 to support many systems on a single bussed cable and increased noise immunity allows faster communications over distances more than 1,000 ft.

The Serial Bus Interface gives RS-232 users a convenient method for converting to RS-422 and creates an environment for bussing up to 32 serial devices on a single cable or connecting devices over long distances.

For complete information on both of these standards, contact the Electronic Industries Association, Engineering Department, 2001 Eye Street, N.W., Washington, DC 20006.

1.2 SERIAL BUS INTERFACE MODELS

ORMEC offers four Serial Bus Interface modules (SBI-900, SBI-901, SBI-910, SBI-911) for specific application requirements.

SBI-900 P.C. board (2.1" x 4") converts RS-232 (25-pin, "D-series" male) to RS-422 (25-pin, "D-series" female); for use in applications with minimal panel space but depth available behind panel; uses right angle connectors and configurable jumper blocks

SBI-901 Same as SBI-900 except: straight connector for RS-232 interface; for use in applications with minimal depth behind panel but adequate panel space available

SBI-910 Same as SBI-900 except: no configurable jumper block

SBI-911 Same as SBI-901 except: no configurable jumper blocks

Note: All modules are shipped configured for RS-232 DCE with flow control and RS-422 DTE.

SPECIFICATIONS

2.1 GENERAL SPECIFICATIONS

Power	Can be host-powered from either the RS-232 or RS-422 device or self-powered via JM3 and a separate 4-wire cable
	+5V 100 mA (max)
	±12V 20 mA (max)
Environment	0-60°C, 0-90% relative humidity
Size	2.1" x 4.1"

2.2 MATING CONNECTORS

25 pin Male "D-Sub"	discrete wire	AMP P/N 745211-2
	mass connect	BERG P/N 66167-025
25 pin Female "D-Sub"	discrete wire	AMP P/N 745209-2
	mass connect	BERG P/N 66168-025

INSTALLATION

The Serial Bus Interface conforms to EIA standards for both the RS-232 and RS-422 electrical specifications. The following tables describe in detail the default input, output connections for each device.

3.1 RS-422 INTERFACE (Default Configuration)

The **RS-422** interface (JF5) is a 25 pin, **female** "D-Sub" connector configured per the following table:

Signal Name	In/Out	Pin
RECEIVE DATA (RD)	IN	18/6
SEND DATA (SD)	OUT	16/4
CLEAR TO SEND (CS)	IN	21/9
REQUEST TO SEND (RS)	OUT	19/7

Note: Pin numbers to the left of the slash are non-inverted signals while pin numbers to the right of the slash are inverted signals. Also, RS-422 input signals are pulled high and low to maintain valid signals when there is no active driver on the serial bus.

3.2 RS-232 INTERFACE (Default Configuration)

The **RS-232** interface (JM1) is a 25 pin, **male** "D-Sub" connector configured per the following table:

Signal Name	In/Out	Pin
TRANSMIT DATA (TxD)	IN	2
RECEIVE DATA (RxD)	OUT	~~3~~ 3
DATA TERMINAL READY (DTR)	IN	20
CLEAR TO SEND (CTS)	OUT	5
FRAME GROUND (FG)		1
SYSTEM GROUND (SG)	IN	7

Note: To conform with a wide variety of DTE devices, the SBI uses the DTR and CTS signals for flow control instead of RTS (REQUEST TO SEND). An optional signal, TxENB (TRANSMIT ENABLE), is both RS-232 and TTL compatible and allows the user to disable the drivers on the RS-422 interface.

3.3 HOW POWER IS CONFIGURED

Three basic methods for supplying power to the Serial Bus Interface allows the user to configure power for specific application requirements.

3.3.1 Supplying Power From RS-422 Device

The SBI comes from the factory with jumpers provided for supplying power from a RS-422 device. First, be sure the RS-422 device is strapped to output power to correspond with the "D-sub" configuration listed below. See appendix 5.1.

Signal Name	Jumper Locations (J4)	In/Out	Pin
+5V	5 - 6	IN	25
+VEXT (+12V)	3 - 4	IN	11
-VEXT (-12V)	1 - 2	IN	23
COMMON	23 - 24		1

3.3.2 Supplying Power From RS-232 Device

Power can also be supplied from an RS-232 device by taking the jumpers provided on the RS-422 side and reconfiguring the power as illustrated below. See appendix 5.1.

Signal Name	Jumper Locations (J2)	In/Out	Pin
+5V	5 - 6	IN	25
+VEXT (+12V)	3 - 4	IN	11
-VEXT (-12V)	1 - 2	IN	23

Note: COMMON is provided through SIGNAL GROUND (SG).

3.3.3 Supplying Power Through JM3

The third method for supplying power to the SBI is to configure power through the JM3 connector as listed below. Be sure to remove all factory installed power jumpers before connecting power through JM3. See appendix 5.1.

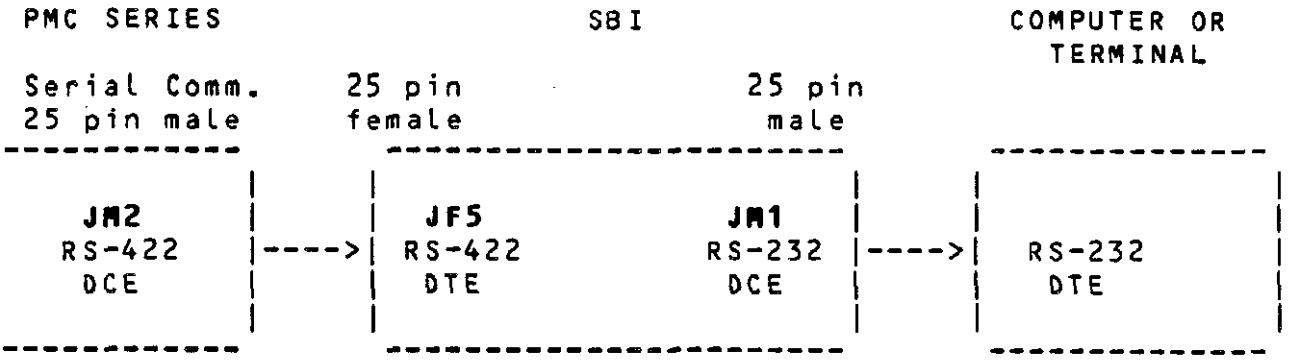
Signal Name	In/Out	Pin
+5V	IN	1
+12V	IN	2
-12V	IN	3
COMMON		4

3.4 CONFIGURING FOR DTE AND DCE DEVICES

An advanced feature of the SBI-900 and SBI-901 is their ability to configure communications between Data Terminal Equipment (DTE) and Data Communications (DCE) Equipment. These models feature configurable jumper blocks which allow convenient interfacing between DCE and DTE devices.

The illustration below shows the standard configuration for the SBI as it is shipped from the factory and how it interfaces with the PMC. To interface the SBI with a PMC, the jumper configuration on the PMC must be set to supply power to the SBI. **To power the SBI from the PMC power supply, the PMC configuration header (J5) must have jumpers added as follows: Pins 1-2 (-12V), Pins 2-3 (+12V), Pins 3-4 (+5V) and Pins 19-20 (Common).** See the PMC manual for more information.

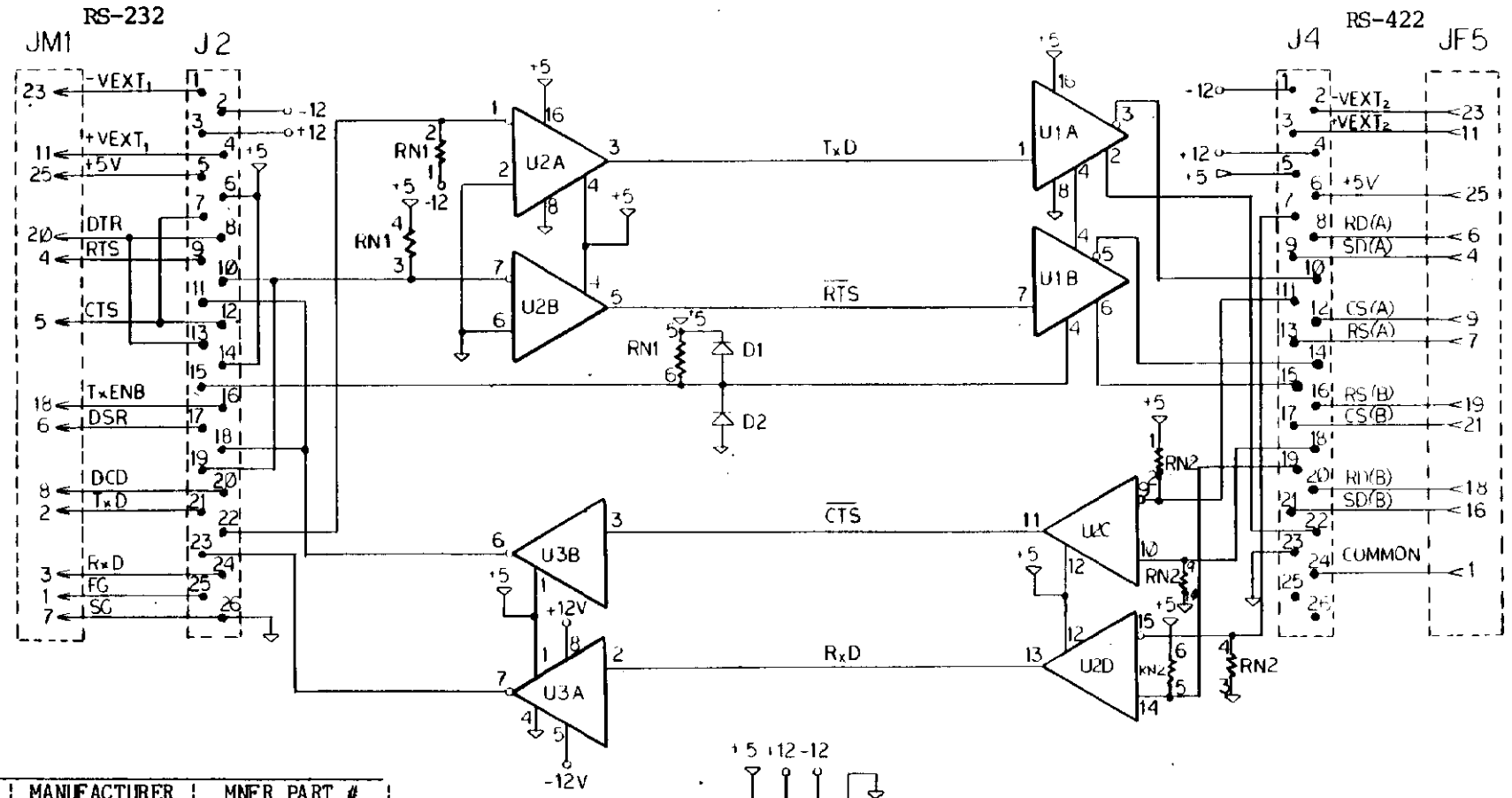
3.4.1 Standard SBI Interface to PMC



Remember that the SBI-910 and SBI-911 have dedicated configurations using etched PC traces at the J2 and J4 connector sites. See Appendix 5.2.

See Appendix 5.3 "SBI Strapping Configurations" for complete details.

B	SBIØØ1	E	1	1



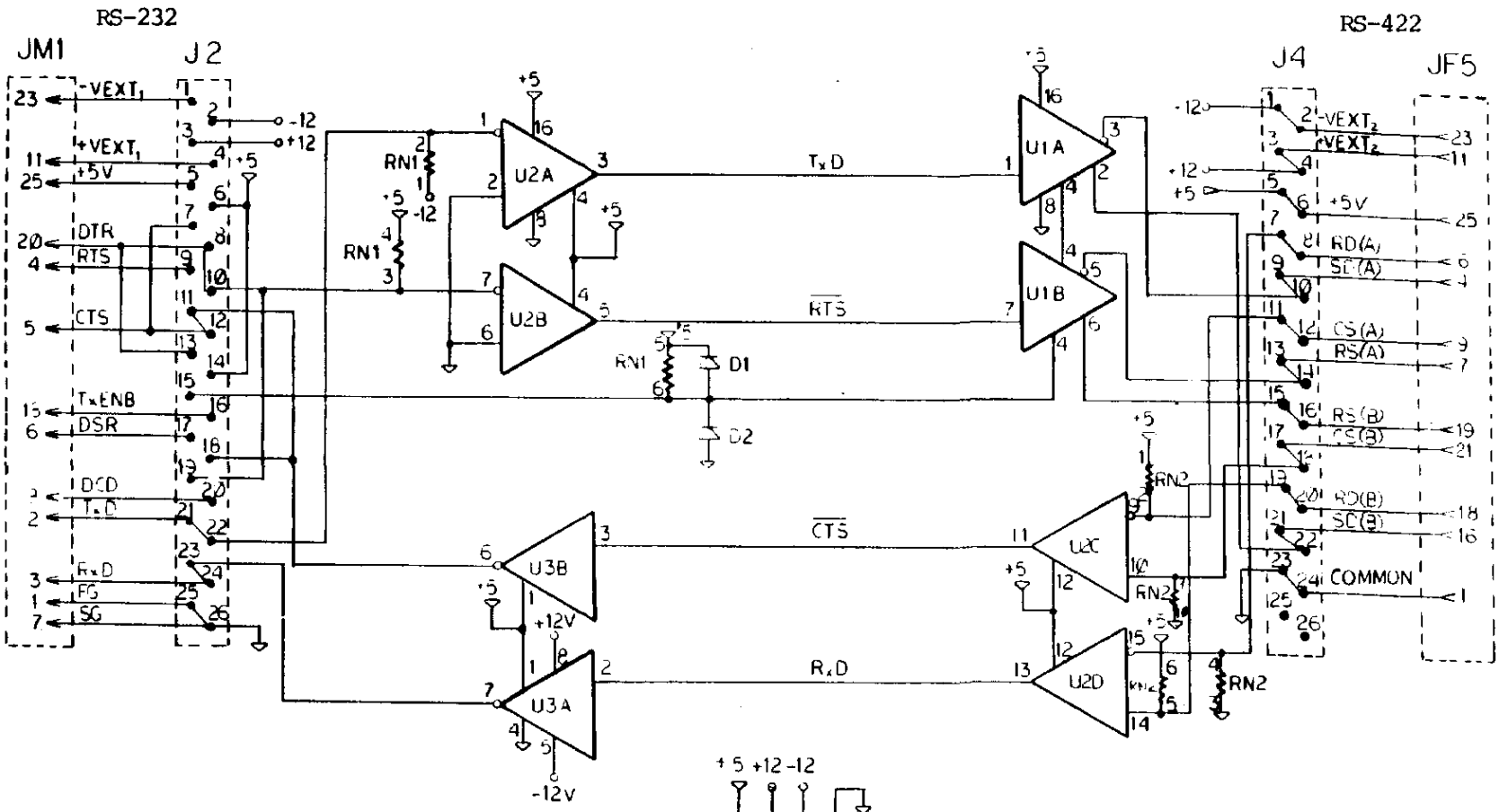
REF. CODE	MANUFACTURER	MNFR PART #
U1	TI	SN75174NG
U2	TI	SN75175N
U3	TI	75150P

APPENDIX 5.1

ORMEC SYSTEMS CORP

DATE	313-84	SBI-900 SERIES
DRAWN		RS232 - RS422 INTERFACE
APPROVED		SIZE B · DRAWING IDENTIFICATION SBIØØ1 · REV E · SHEET 1 · OF 1

B	SBI003	A	1	1



REF.CODE	MANUFACTURER	MNFR PART #
U1	TI	SN75174NG
U2	TI	SN75175N
U3	TI	75150P

APPENDIX 5.2

CONTACT SUPPLY

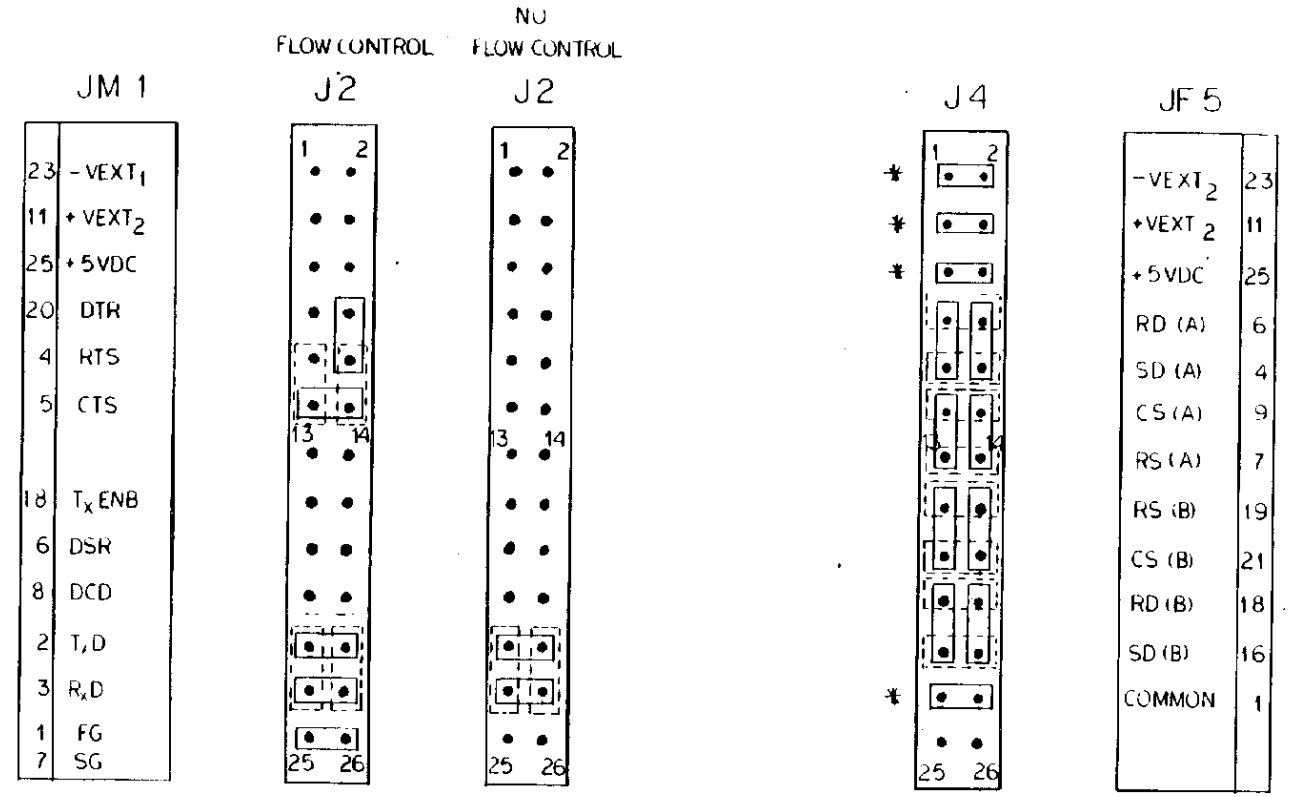
ORMEC SYSTEMS CORP

DATE	7-12-84	SBI-910 SERIES			
DRAWN		RS232 - RS422 INTERFACE			
APPROVED		SIZE B	DRAWING IDENTIFICATION SBI003	REV A	SHEET 1 OF 1

B	SBI009	A	1	1

NOTE:
FACTORY DEFAULT CONFIGURATION IS:

1) RS-232 DCE WITH FLOW CONTROL
2) RS-422 DTE WITH FLOW CONTROL
3) POWER JUMPERS AS SHOWN ON J4 (*)



D-SUB PIN ASSIGNMENT

RS-232

NOTE: ▭ DCE
▭ DTE

* All units are shipped RS-232 DCE and RS-422 DTE with J4 power jumpers installed

D-SUB PIN ASSIGNMENT

RS-422

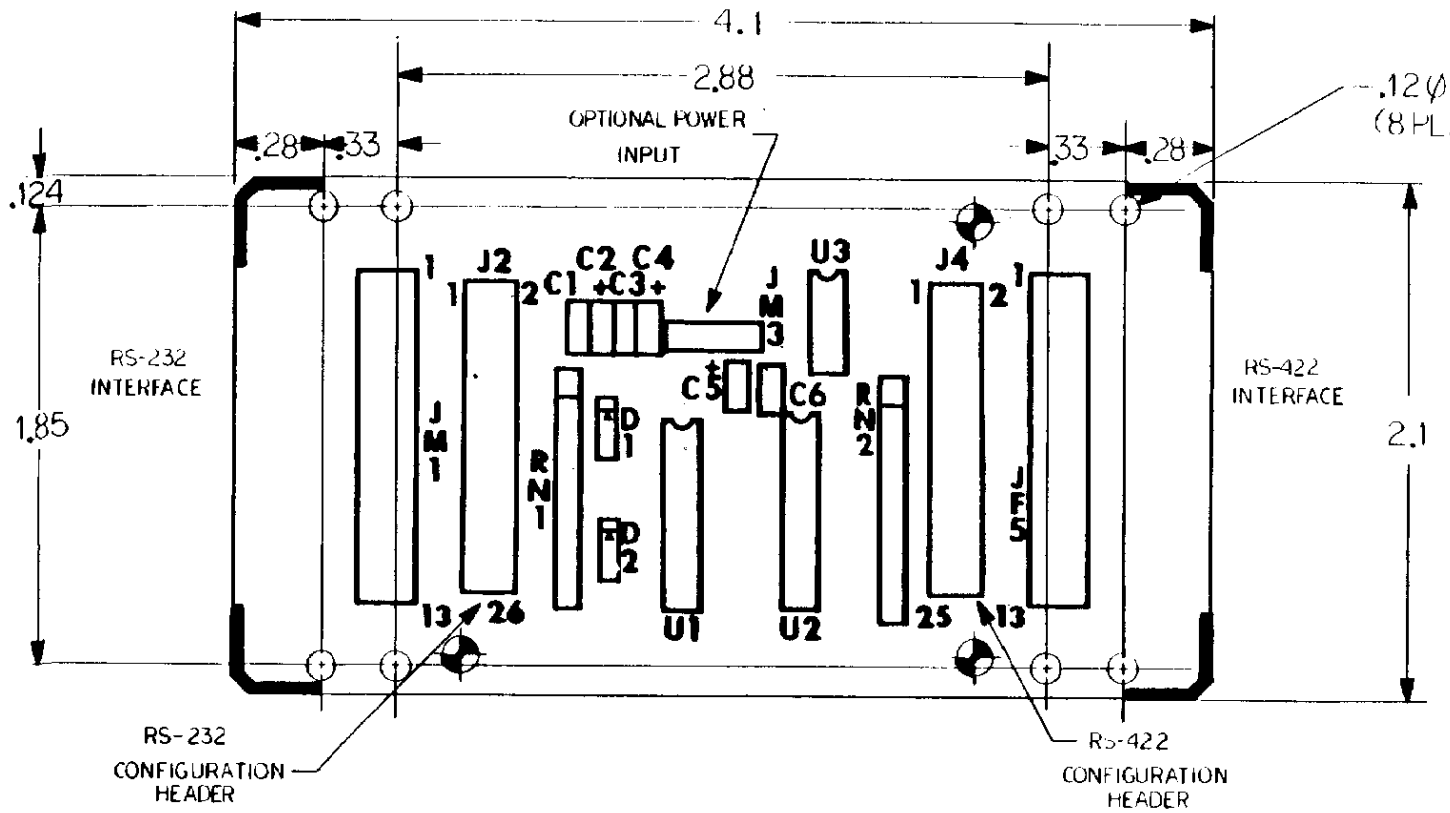
APPENDIX 5.3

CONTACT SUPPLY

ORMEC SYSTEMS CORP

DATE	7-13-84	SBI STRAPPING CONFIGURATIONS				
DRAWN	C.J. Hurst					
APPROVED		SIZE	DRAWING IDENTIFICATION	REV	SHEET	OF
		B	SBI009	A	1	1

SIZE	DRAWING IDENTIFICATION	REV	SHEET	OF
B	SBI008	A	1	1



APPENDIX 5.4

CONTACT SUPPLY

ORMEC SYSTEMS CORP

DATE 7-12-84	SERIAL BUS INTERFACE
DRAWN J. Gilbert	COMPONENT LAYOUT
APPROVED	SIZE B · DRAWING IDENTIFICATION SBI008 · REV A · SHEET 1 · OF 1