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USER MANUAL

Accessory 26A

Serial Communications Converter

3Ax-602213-xUxx

October 15, 2003

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INTRODUCTION

PMAC's Accessory 26A is a new version of the serial communication optical isolation board for all versions of PMAC. It replaces the old Acc-26, which was suitable only for the PMAC PC and the PMAC VME. In the new version, Acc-26A Option 1 can be used for optical isolation of the host computer's RS-232 to PMAC's RS-422 connector J4 (this is suitable for the PMAC PC, PMAC VME, and PMAC Lite equipped with Option 9L). Acc -26A Option 2 is suitable for the regular PMAC Lite and the PMAC STD32 (The cable is not provided for PMAC STD32). Option 2 simply acts as an optical isolation board between the host's RS-232 and the PMAC's RS-232 connectors. Acc-26A Option 3 provides, through its J5 (JGEF) connector, optical isolation of the serial communication link between a host computer and the GE-FANUC series 90-70 PLC. Acc-26A Option 4 may be used for Delta Tau's other motion control cards (SMCC and MCC).

The board comes with a standard DIN-rail mounting system, or the four corner holes can be used to mount the board with standoffs.

Both DB9 and DB25 connectors are provided for host connection.

Selecting the Correct Option

When ordered as Acc-26A Option 1, this board comes equipped for RS-232 to RS-422 conversion and optical isolation. In this configuration, IC U1 plus resistor packs RP1 and RP2, are installed; IC U2 is not installed. Acc-26A Option 1 should be ordered for optically isolated host serial communication to the PMAC PC, PMAC VME and PMAC Lite with its Option 9L. A 26-pin flat cable is provided for connecting this accessory's J1 connector to the PMAC's RS424 connector (J4 on PMAC PC and PMAC VME).

When ordered as Acc-26A Option 2, this board comes equipped for RS232 to RS232 optical isolation. In this configuration, IC U2 is installed; IC U1 and the resistor packs RP1 to RP3 are not installed. Option 2 should be ordered for optically isolated host serial communication to the regular PMAC Lite (one without its Opt. 9L) and PMAC STD32. A 10-pin flat cable is provided for connecting this accessory's J4 connector to PMAC Lite board's RS-232 connector (J4). For PMAC STD32, a separate cable should be special ordered.

When ordered as Acc-26A Option 3, this board comes equipped for RS232 to RS422 conversion and optical isolation. In this configuration, IC U1 plus resistor packs RP1 and RP3 are installed; IC U2 is not installed. Acc-26A Option 3 should also be ordered for communication between any RS232 host and the GE FANUC series 90-70 PLC. A DB15S connector cable is provided for connection to the GE FANUC series 90-70 PLC.

When ordered as Acc-26A Option 4, this board comes equipped for RS232 to RS232 optical isolation. In this configuration, IC U2 is installed; IC U1 and the resistor packs RP1 to RP3 are not installed. Option 4 should be ordered for optically isolated host serial communication to SMCC and MCC. A 26-pin flat cable is provided for connecting this accessory's J1 connector to SMCC's J2 connector and MCC's JRS232 connector.

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Jumpers

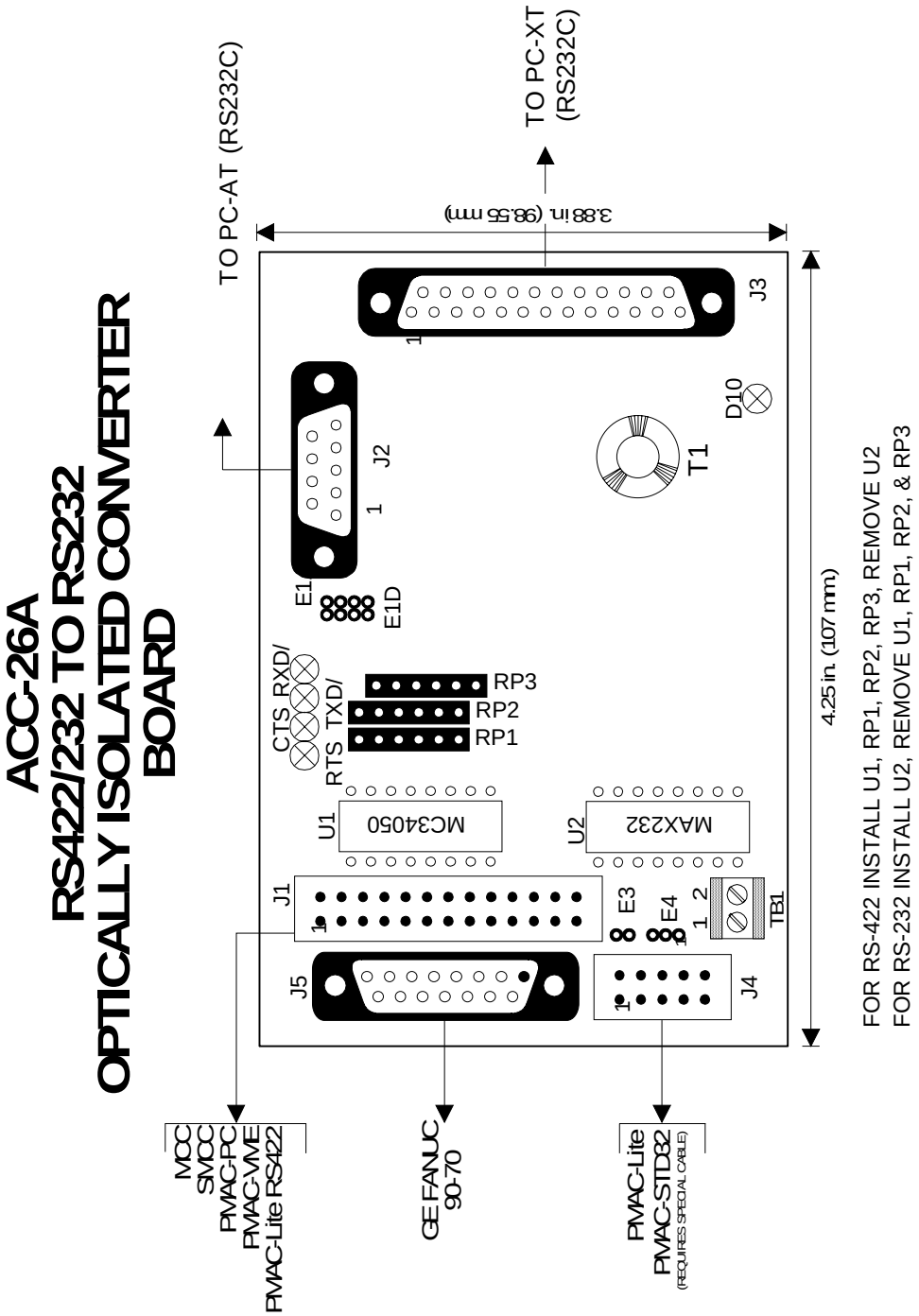
E Point	Physical Layout	Description	Default
Serial Data Direction			
E1A E1B		Connect E1A 1 to 2 and E1B 1 to 2 for normal host (PC) and terminal (PMAC) serial communication operation. For reverse protocol, connect E1A pin 1 to E1B pin 1 and E1A pin 2 to E1B pin 2.	E1A pin 1 to pin 2 jumper installed E1B pin 1 to pin 2 jumper installed
Handshake Direction			
E2A E2B		Connect E2A 1 to 2 and E2B 1 to 2 for normal host (PC) and terminal (PMAC) serial communication operation. For reverse protocol, connect E2A pin 1 to E2B pin 1 and E2A pin 2 to E2B pin 2.	E2A pin 1 to pin 2 jumper installed E2B pin 1 to pin 2 jumper installed
SMCC Init/			
E3			No jumper installed for PMAC
TB1 Power Supply			
E4		Connect E4-2 to E4-1 for power supply input from appropriate J connector (J1, J4 or J5). For power supply input from Terminal Block TB1, connect E4-2 to E4-3	Jumper 1-2 installed

E-Point Jumper Summary

Jumper	On/off	Description
E1A, E1B	On	Default settings for standard RXD and TXD serial communication lines. Considered horizontally connected.
E1A to E1B		Connect these vertical to each other to switch RXD and TXD communication lines.
E1C (E2A), E1D (E2B)	On	Default settings for standard RTS and CTS serial communication lines. Considered horizontally connected.
E1C to E1D		Connect these vertical to each other to switch RTS and CTS communication lines.
E3		Installed only for Option 4 (SMCC and MCC).
E4	1-2 2-3	Power supply select PMAC, SMCC, MCC (default) External 5V power supply needed

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Board Layout



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SETUP AND OPERATING PROCEDURES

The Acc-26 requires very little setup. Simply connect it to the host computer through the DB9 or DB25 connector; whichever matches your host's serial port. Do not connect both of these connectors, or you will get contention.

Jumpers on the Acc-26 are set up as default at the factory for the typical way a PC uses the serial communications lines (as the commanding device). If this is not the way the host device works, exchange the RXD and TXD lines by changing the E1A and E1B jumpers from horizontal to vertical, and exchange the RTS and CTS lines by changing the E1C and E1D (E2A and E2B in schematic) jumpers from horizontal to vertical.

Jumper E3 should be installed for Option 4 only (SMCC and MCC). Jumper E4 provides the choice between using the PMAC, SMCC or MCC power supply verses a separate power +5V supply brought in through the 2-pin terminal block TB1. An external power supply input through TB1 should be used for applications in which this accessory board is placed physically a long distance away from PMAC, SMCC or MCC. Otherwise, jumper E4 pins 2 to 1 for the motion control board supply of power to this accessory board.

The Acc-26A requires no software setup, and can handle any baud rate up to PMAC's maximum. Once installed and operational, it is transparent to the user.

There are four dual-color LEDs on the Acc-26A to show when the key communications lines are being used. Each LED is red when the corresponding line is not in use, and green when it is in use. LED D1 is for the RXD/ line, D2 is for the TXD/ line, D3 is for CTS, and D4 is for RTS. (These are the only lines that PMAC requires for serial communications; the Acc-26A shorts together the DSR and DTR lines for those hosts that require a return pulse on one, for a pulse on the other). These lamps can be used to troubleshoot communications problems. Lamp D5 is a green LED that is on when the card is receiving power.

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CONNECTORS

J1 JRS422 (26 Pin Connector)

Pin	Symbol	Function	Description	Notes
1	CHASSI	Common	PMAC Common	
2	S+5V	Output	+5Vdc supply deactivated by E8 on PMAC	
3	RD-	Input	Receive Data	Diff. I/O low True
4	RD+	Input	Receive Data	Diff. I/O high True
5	SD-	Output	Send Data	Diff. I/O low True
6	SD+	Output	Send Data	Diff. I/O high True
7	CS+	Input	Clear to Send	Diff. I/O high True
8	CS-	Input	Clear to Send	Diff. I/O low True
9	RS+	Output	Request to Send	Diff. I/O high True
10	RS-	Output	Request to Send	Diff. I/o low True
11	DTR	Bidirection	Data Terminal Ready	Tied to DSR
12	INIT/	Input	PMAC Reset	Low is Reset
13	CND	Common	PMAC Common	
14	DSR	Bidirection	Data Set Ready	Tied to DTR
15	SDIO-	Bidirection	Special Data	Diff. I/O low True
16	SDIO+	Bidirection	Special Data	Diff. I/O high True
17	SCIO-	Bidirection	Special Ctrl. Diff.	I/O low True
18	SCIO+	Bidirection	Special Ctrl. Diff.	I/O high True
19	SCK-	Bidirection	Special Clock	Diff. I/O low True
20	SCK+	Bidirection	Special Clock	Diff I/O high True
21	SERVO-	Bidirection	Servo Clock	Diff. I/O low True
22	SERVO+	Bidirection	Servo Clock	Diff I/O high True
23	PHASE-	Bidirection	Phase Clock	Diff. I/O low True
24	PHASE+	Bidirection	Phase Clock	Diff I/O high True
25	GND	Common	PMAC Common	
26	+5V	Output	+5VDC Supply	

This connector should be used to connect Acc-26A to the PMAC PC and PMAC VME board's J4 connector via the supplied 26-pin flat cable for Acc-26A Option 1. In addition, for Acc-26 Option 4, this connector provides the link to SMCC and MCC boards.

J2 JRS232AT (9 Pin DB Connector)

Pin	Symbol	Function	Description	Notes
1	DCD	NC	Data Carrier Detect	Not used
2	RXD/	Output*	Receive Data	Low is True
3	TXD/	Input*	Transmit Data	Low is True
4	DTR	Bidirection	Data Terminal Ready	Connected to DSR
5	GND	Common	PMAC Common	
6	DSR	Bidirection	Data Set Ready	Connected to DTR
7	RTS	Input**	Request to Send	
8	CTS	Output**	Clear to Send	
9	R I	NC	Ring Indicator	Not used

This connector is used for connection to a host computer's RS232 connector through a DB9's connector.

* To change signal direction, change E1A/E1B jumpers from horizontal to vertical. See the enclosed schematic.

** To change signal direction, change E2A/E2B jumpers from horizontal to vertical. See the enclosed schematic.

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J3 JRS232XT (25 Pin DB Connector)

Pin	Symbol	Function	Description	Notes
1		NC		Not connected
2	TXD/	Input*	Transmit Data	Low is True
3	RXD/	Output*	Receive Data	Low is True
4	RTS	Input**	Request to Send	
5	CTS	Output**	Clear to Send	
6	DSR	Bidirection	Data Set Ready	Connected to DTR
7	GND	Common	PMAC Common	
8		NC		Not connected
9		NC		Not connected
10	INIT/	Input	PMAC Reset	Low is Reset
11-19		NC		Not connected
20	DTR	Bidirection	Data Terminal Ready	Connected to DSR
21-25		NC		Not connected

This connector is used for connection to a host computer's RS232 connector through a DB25 connector.

* To change signal direction, change E1A/E1B jumpers from horizontal to vertical. See the enclosed schematic.

** To change signal direction, change E2A/E2B jumpers from horizontal to vertical. See the enclosed schematic.

J4 JRS232 (10 Pin Connector)

Pin	Symbol	Function	Description	Notes
1	PHASE	NC	Phase Clock	Not used
2	DTR	Bidirection	Data Terminal Ready	Connected to DSR
3	TXD/	Output	Transmit Data	Low is True
4	CTS	Input	Clear to Send	
5	RXD/	Input	Receive Data	Low is True
6	RTS	Output	Request to Send	
7	DSR	Bidirection	Data Set Ready	Connected to DTR
8	SERVO	NC	Servo Clock	Not used
9	GND	Common	PMAC Common	
10	+5V	Input	+5V DC Supply	

This connector should be used to connect Acc-26A to PMAC Lite's J4 connector via the supplied flat cable for Acc-26A Option 2.

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J5 JGEF (15-Pin DB Connector)

Pin	Symbol	Function	Description	Notes
1	SHIELD	Common	Cable Shield	Connected to GND
2	NC			No connection
3	NC			No connection
4	NC			No connection
5	+5V	Input	Power Supply	
6	-RTS(A')	Output	Request to Send/	
7	GND	Common	GE Fanuc Common	
8	+CTS(B)	Output	Clear to Send	
9	NC			No connection
10	-RD(A)	Input	Read Data/	
11	+RD(B)	Input	Read Data	
12	-SD(A')	Output	Send Data/	
13	+SD(B')	Output	Send Data	
14	+RTS(B')	Input	Request to Send	
15	-CTS(A)	Output	Clear to Send/	
This connector should be used to connect Acc-26A to the GE FANUC series 90-70 PLC. For this purpose Acc-26A Option 3 should be ordered.				

TB1 (2 Pin Terminal Block)

Pin	Symbol	Function	Description	Notes
1	GND	Common		
2	+5V	Input	Power Supply	
This connector should be used to connect Acc-26A to separate local power supply. This connection is not necessary unless the physical distance between PMAC and this accessory is too long.				

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