46034

HUBBING MODULE

46034-00
HUBBING
MODULE

RX 1
RX 2
RX 3
RX 4
RX 5
RX 6
RX 7
RX 8
TX 1
TX 2
TX 3
TX 4
TX 5
TX 6
TX 7
TX 8

RXD
TXD

Dantel
46034-00 REV__

Table of Contents

About this Practice:

• This practice has been reformatted to meet ISO 9001 requirements.

Reissued Practices: Updated and new content can be identified by a banner in the right margin.

Issue date: September 1997

UPDATED

CAUTION

• Install or remove modules from the shelf only when the power is off. If you install a module in the shelf with the power on, the internal circuitry may suffer damage and the product warranty will be void.

• Remove and install circuit boards only in a static-safe environment (use antistatic wrist straps, smocks, footwear, etc.).

• Keep circuit boards in their antistatic bags when they are not in use.

• Do not ship or store circuit boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.

• For more complete information on electrostatic discharge safety precautions, refer to Bellcore™ Technical Reference # TR-NWT-000870.

ORDERING INFORMATION

NOTE: This section lists the different options available for this product. To order any of the available options, contact Dantel Inside Sales through our toll-free number, **1-800-432-6835.**

OPTION NUMBER	FEATURES
B11-46034-00	Hubbing Module

GENERAL DESCRIPTION

The 46034 Hubbing Module provides nine data ports for digital data summing, distribution or bridging.

Each port connects through six individual communication buses. Ports one through eight can accept data through RS-232 and RS-422 interfaces, depending on the strapping selection. Port nine operates with an optional on-board communications subassembly. The interface type depends on the selected subassembly.

If handshaking is required with RS-232 communications, the module can operate up to five RS-232 data ports. One of those five RS-232 data ports is port nine, operating with a 49029 RS-232 Current Loop Interface Subassembly.

The module comes with a TTL subassembly (bypass card) that allows port nine to function as a TTL data bus interface in the absence of a subassembly.

Interface and data connections are set using module switch and strap options. Ports one through eight operate at a maximum of 38,400 baud. The maximum data rate for port nine depends on the subassembly installed. Refer to the subassembly documentation for more information.

The 46034 Hubbing Module is a plug-in printed circuit module that fits into any Dantel 400-type or similar equipment housing. The module operates on -21 to -56 VDC input power.

CIRCUIT DESCRIPTION

Fig. 1 shows the 46034 Hubbing Module functional schematic.

Ports one through eight operate identically. Refer to Tables A and B for specific pin assignments. Mini-jumpers 1A through 8A selects port operation of RS-232, RS-422 terminated, or RS-422 unterminated data. Received data is inverted and goes to the data bus for distribution. The received signal illuminates the front panel RX LED.

CIRCUIT DESCRIPTION

The data bus consists of six individual, switch selectable data lines which route the data to the desired ports. Data received from the data bus applies to one input of a two-input OR gate. The other OR gate input connects to switch S22 for full- or half-duplex operation.

When switch S22 is in full-duplex mode (switch open), a constant low applies to the input, which passes all data received from the data bus to the port transmit circuitry. When S22 is in half-duplex mode (switch closed), the input operates with the port receive circuitry.

When the port is not receiving data, the input holds in the low state and the OR gate passes data received from the data bus. When the port receives data the input fluctuates between high and low, enabling and disabling the OR gate and preventing port data transmission.

The OR gate output applies to a driver that transmits data through the RS-232 or RS-422 interface, depending on the strap selection of mini-jumpers 1B through 8B. The signal illuminates the front panel TX LED.

The ninth data port provides a mounting for installing various communication subassemblies. With the five six-lever DIP switches, the port supports the following interfaces:

- ◆ TTL
- ◆ RS-232
- ◆ RS-422
- ◆ RS-485
- ◆ 202 tone modem

The ninth data port has CA (pin 36) and CF (pin 18) control leads for RS-232 subassembly applications.

When using a tone modem subassembly, strap C may be configured to allow modem control by RTS command or strapped for RTS always enabled. Use strap D for full- or half-duplex operation. When the strap is in the "1" position, the port operates in full-duplex mode; when in the "2" position, the port operates in half-duplex mode.

When the ninth data port is used with a bypass card subassembly, front panel LEDs indicate RXD (receive data) and TXD (transmit data) activity. When the ninth port is used with any other communications subassembly, module and subassembly LEDs indicate receive and transmit activity. Refer to the subassembly documentation for LED operation information.

The 46034 Hubbing Module has an on-board power supply that operates on -21 to -56 VDC input power. The unit supplies ±12 VDC and +5 VDC that powers the module circuits and an on-board subassembly.

CIRCUIT DESCRIPTION
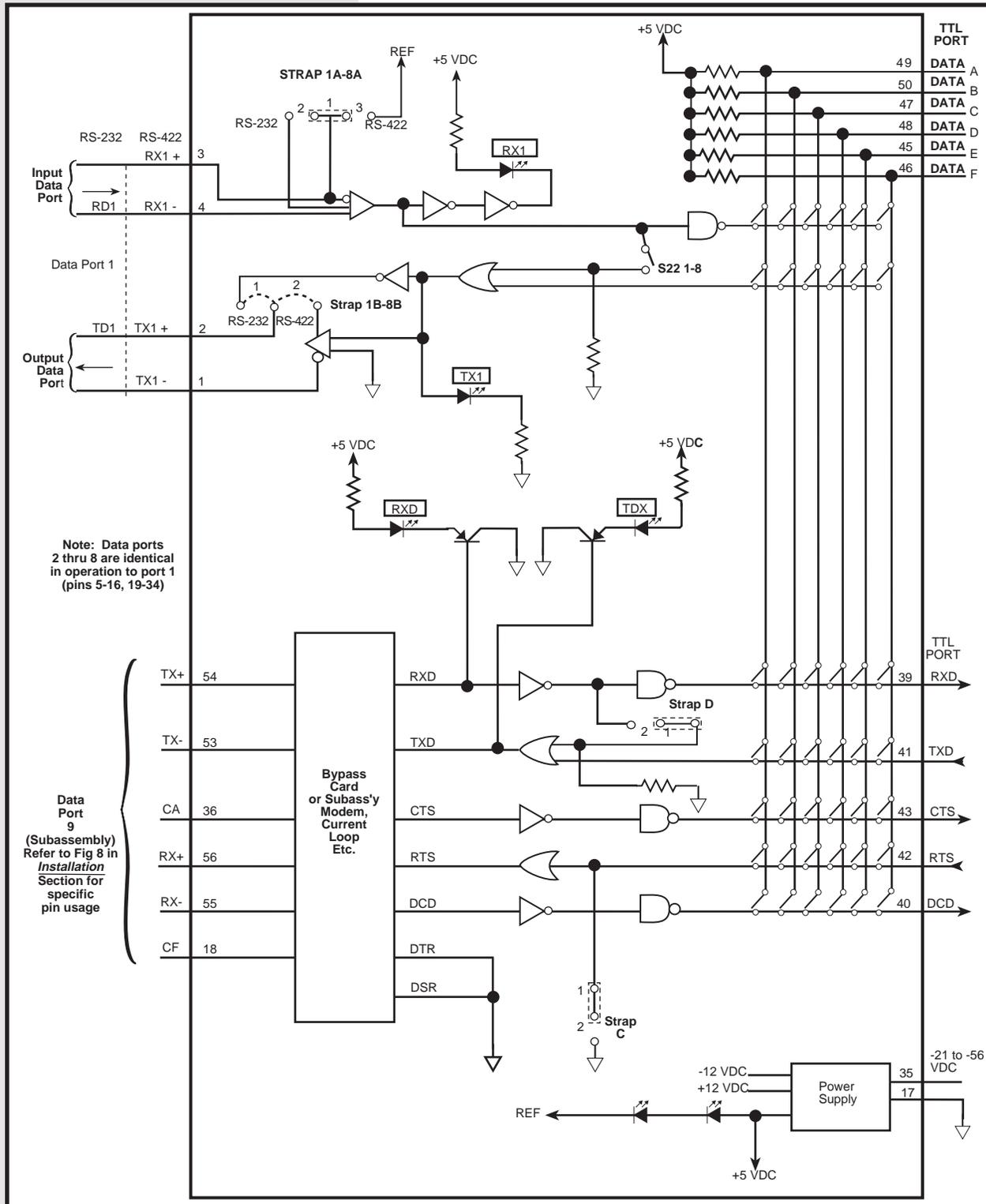
CIRCUIT DESCRIPTION

TABLE A - PC PIN ASSIGNMENT FOR RS-422 PORTS

PORT NUMBER	RS-422 TX+	RS-422 TX-	RS-422 RX+	RS-422 RX-
1	Pin 2	Pin 1	Pin 3	Pin 4
2	Pin 6	Pin 5	Pin 7	Pin 8
3	Pin 10	Pin 9	Pin 11	Pin 12
4	Pin 14	Pin 13	Pin 15	Pin 16
5	Pin 20	Pin 19	Pin 21	Pin 22
6	Pin 24	Pin 23	Pin 25	Pin 26
7	Pin 28	Pin 27	Pin 29	Pin 30
8	Pin 32	Pin 31	Pin 33	Pin 34

TABLE B - PC PIN ASSIGNMENT FOR RS-232 PORTS

PORT NUMBER	RS-232 TD	RS-232 RD
1	Pin 2	Pin 4
2	Pin 6	Pin 8
3	Pin 10	Pin 12
4	Pin 14	Pin 16
5	Pin 20	Pin 22
6	Pin 24	Pin 26
7	Pin 28	Pin 30
8	Pin 32	Pin 34

APPLICATION INFORMATION

Fig. 2 shows a 46034 Hubbing Module application diagram. The 46034 Hubbing Module is used primarily with Dantel's 460 Alarm and Control System (460 ACS) and provides digital data summing, distribution and bridging for the 460 ACS data polling function. The unit can also be used with an on-board subassembly for other data communications features such as a modem or current loop interface.

Note: *Use each of the six buses carrying data between the data communication ports for one data polling system only. If more than one alarm polling system's data routes to a bus, the system does not function properly.*

FIG. 2 - 46034 HUBBING MODULE APPLICATION DIAGRAM
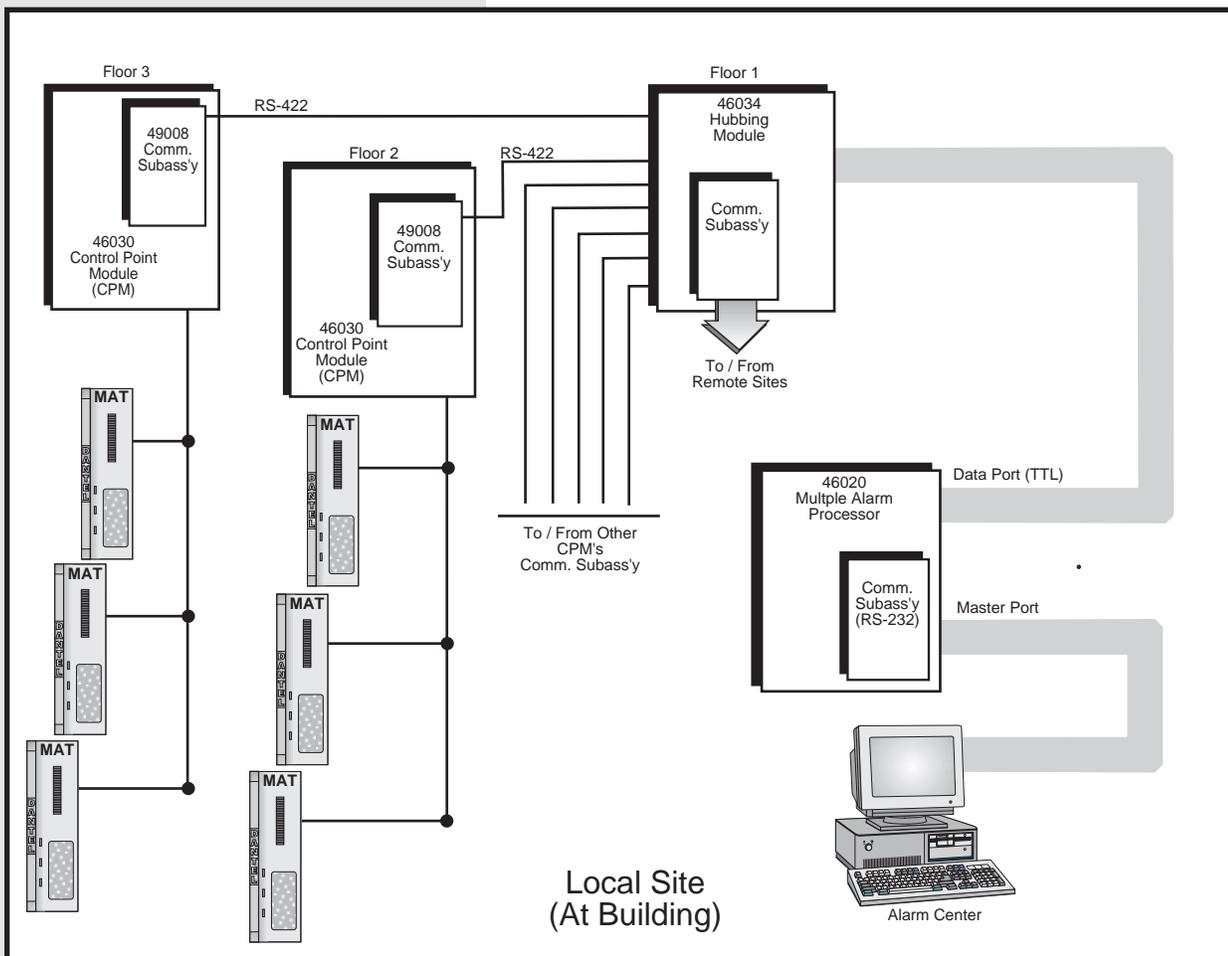
APPLICATION INFORMATION

SUMMING AND DISTRIBUTION APPLICATIONS

Fig. 3 shows a switch setting diagram for summing applications. Each data port to be summed has its bus output switched to the bus. The data port that is to receive the summed data from the contributing data ports has only its bus input switched to the bus. The switches also can be set for distribution of communications using a common data bus. The input from one port distributes to the output of the other ports.

The module's data communication buses route to the edge connector which allows for bus expansion (pins 45 through 50). Additional 46034 Hubbing Modules can share any or all of the same buses which provides data summing/distribution/bridging between data ports in different modules.

BRIDGING APPLICATIONS

Fig. 4 shows a switch setting diagram for bridging applications using half-duplex communication. Each data port on the data bridge must have bus input and output switches set to the bus being used. Because each data port's bus input and output feed to a common OR gate, the data port putting data on the bus cancels its own input at the OR gate.

Fig. 5 shows a switch setting diagram for an RS-232 bridging application using full-duplex communication. Module strapping lets each data port provide either an RS-232 or RS-422 data interface to the six data buses.

When strapped for RS-422 data, each of the eight data ports receives and transmits data. When strapped for an RS-232 interface, two data ports may be required for each interface, which limits the functioning data ports to four (not including port nine). If CF and CA leads are not used, all eight ports are available.

Fig. 3 - Switch Setting Diagram for Summing Applications

Data Ports 4 through 8 are treated the same as 1, 2 and 3 shown above strapped for RS-422
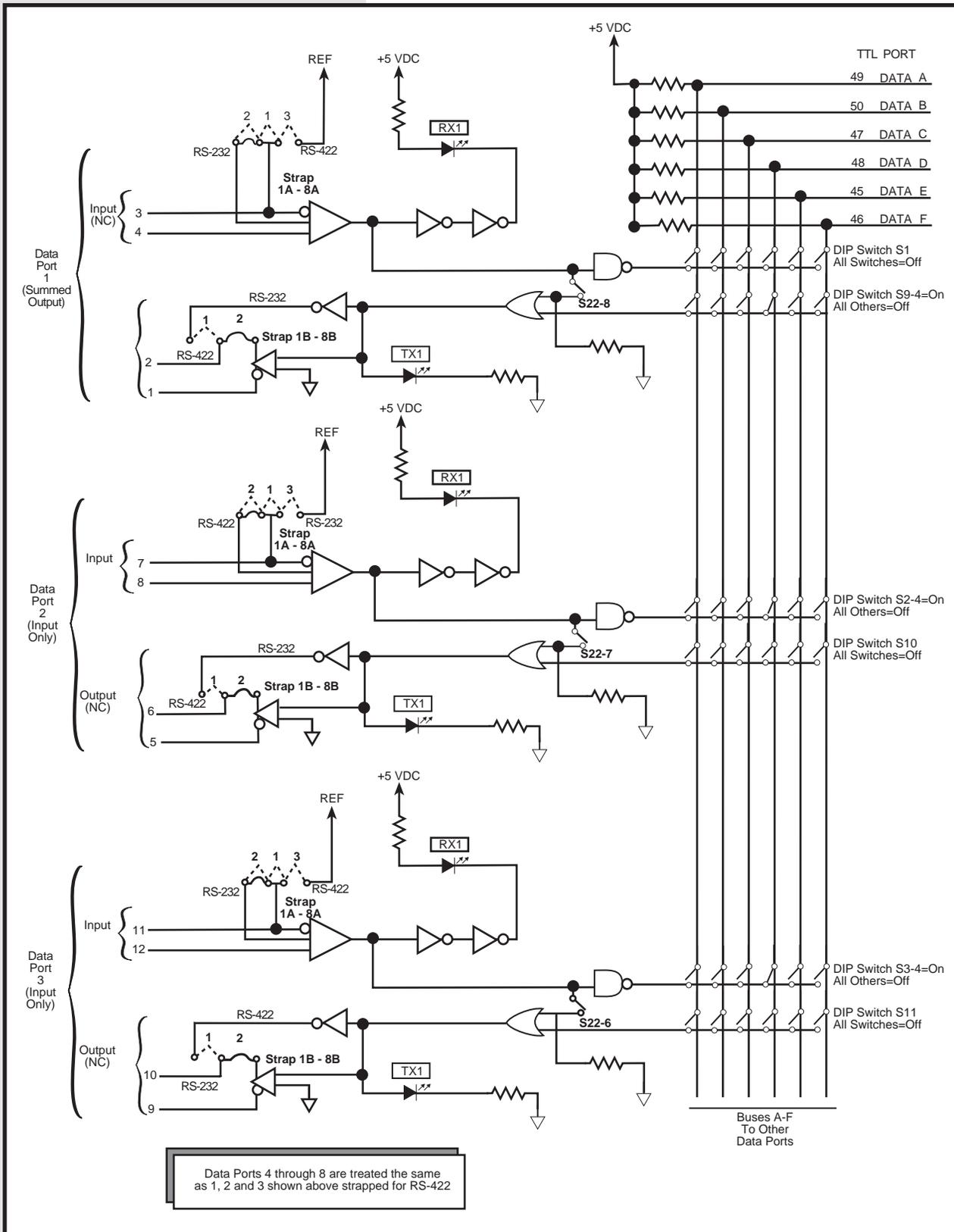
FIG. 4 - SWITCH SETTING DIAGRAM FOR BRIDGING APPLICATIONS (HALF-DUPLEX)

Data Ports 1 and 2 are shown strapped for RS-422 as examples. all other Data Ports are treated similarly
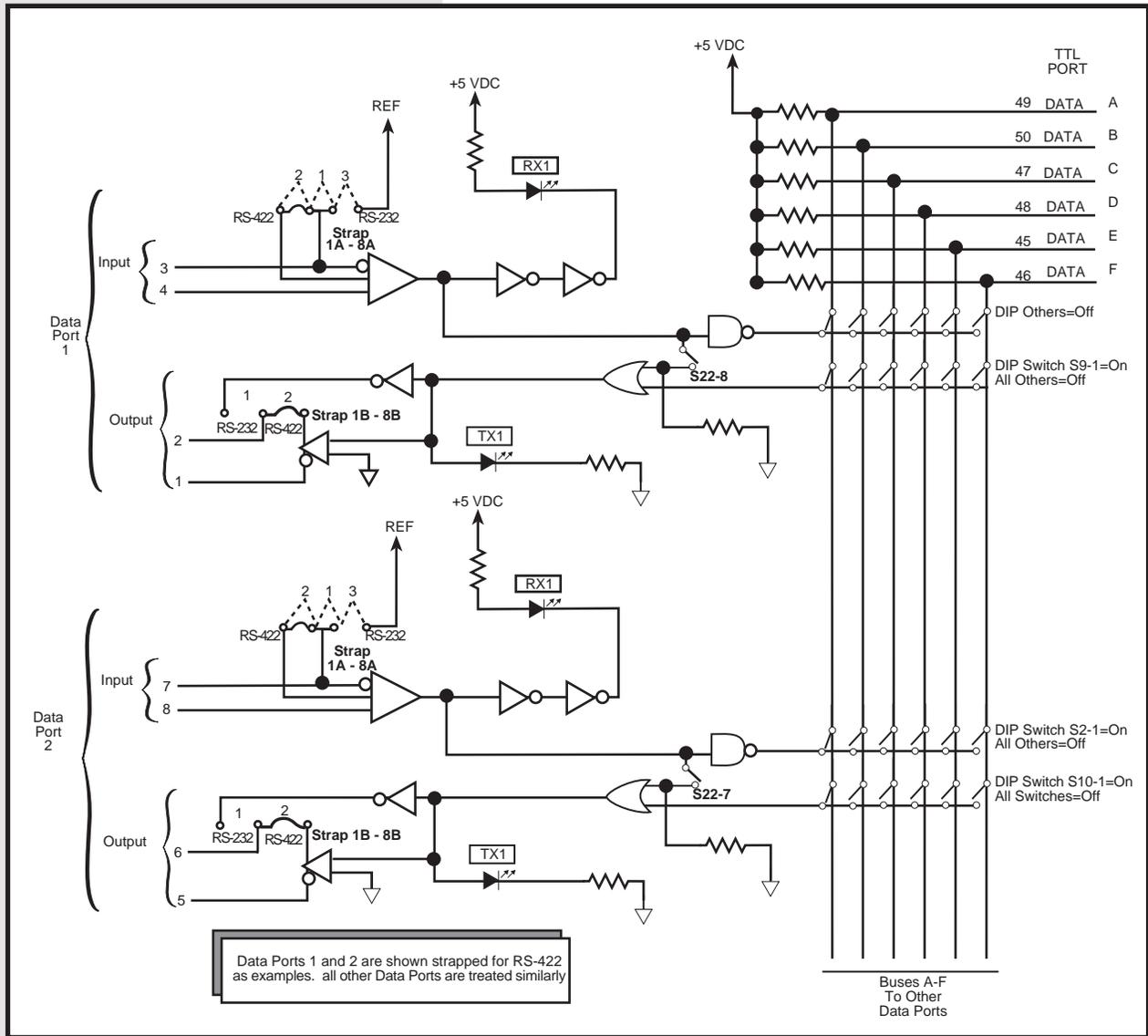
FIG. 5 - SWITCH SETTING DIAGRAM FOR RS-232 APPLICATION (FULL-DUPLEX)

RS-232 (2 Data Ports = RS-232 Port)

Two ports are required for each RS-232, if the CA and CF leads are to be used. For bridging application, put BB and BA on same bus; CA and CF on same bus. For summing application, put output BB port on BA bus; put output CA port on CF bus.
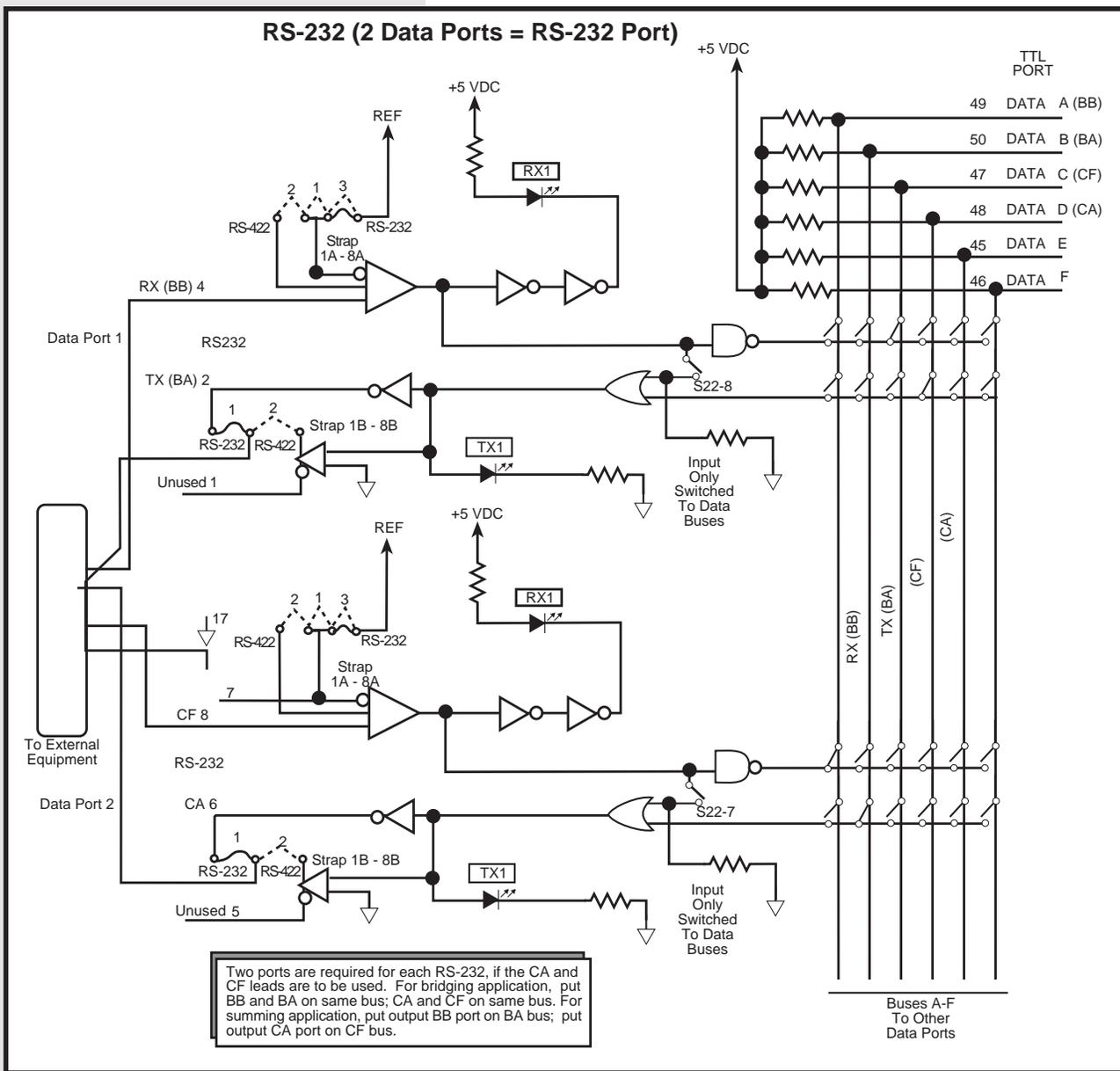
INSTALLATION

Installation consists of installing the subassembly, setting the module straps and switches, wiring the connector, and installing the module in the equipment housing.

1. Install the subassembly.

If a different subassembly is to be installed, remove the three screws from the subassembly mounting standoffs and carefully pull the subassembly out of its connections.

If a TTL subassembly (bypass card) was installed, remove the blue hole plug from the front panel subassembly window.

Install the new subassembly. Refer to Fig. 6. Ensure the subassembly connector pins go into module receptacles J4 and J5. The subassembly should sit down on the standoffs and the subassembly front panel (except for the TTL subassembly) should appear straight in the module front panel opening.

Reinstall the screws on the mounting standoffs.

FIG. 6 - SUBASSEMBLY AND POWER SUPPLY LOCATIONS

Retaining Screws

Power Supply

Current Loop or Tone Modem
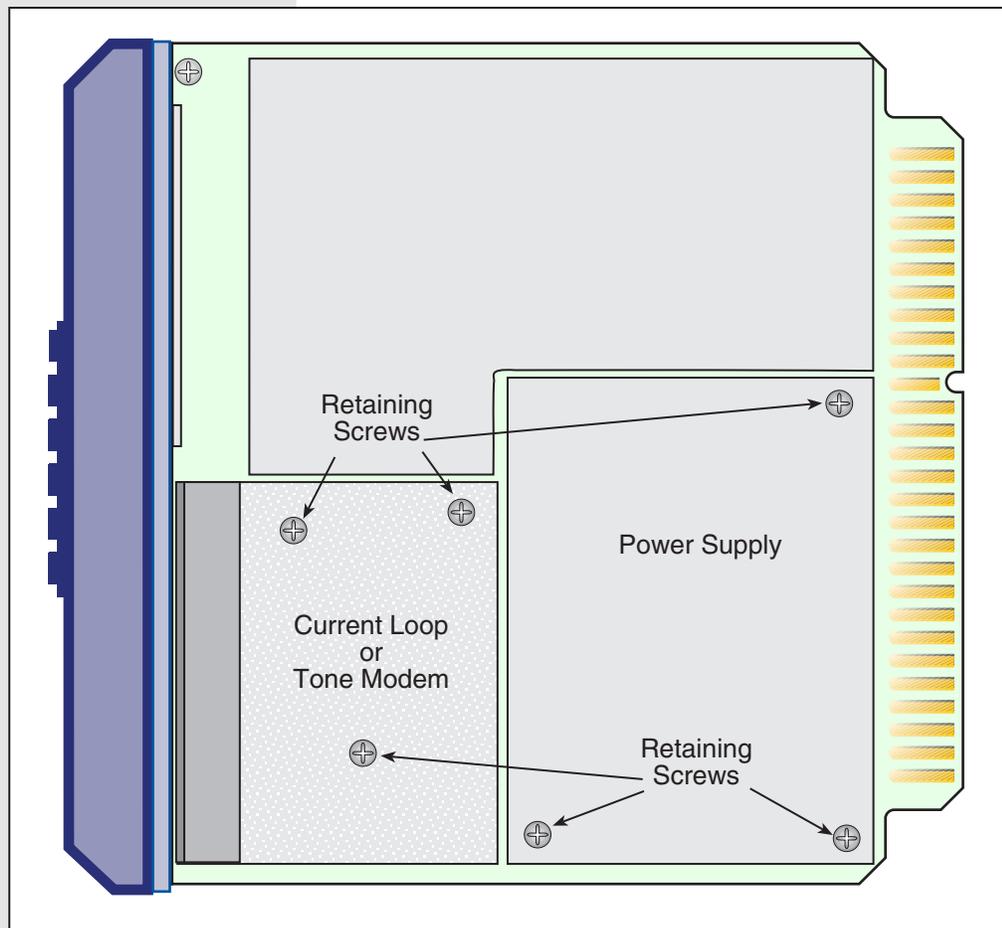
Retaining Screws

2. Set the straps and switches.

Set the straps by removing the power supply. Remove the three retaining screws from the subassembly and carefully pull the subassembly out of its connections.

Once strapping had been verified or corrected, replace the power supply subassembly by aligning the module connector pins with the subassembly connector pins. Gently press the power supply into place. Install the three retaining screws.

Refer to Fig. 7 and Tables C and D for setting straps and switches.

FIG. 7 - SWITCH AND STRAP LOCATIONS
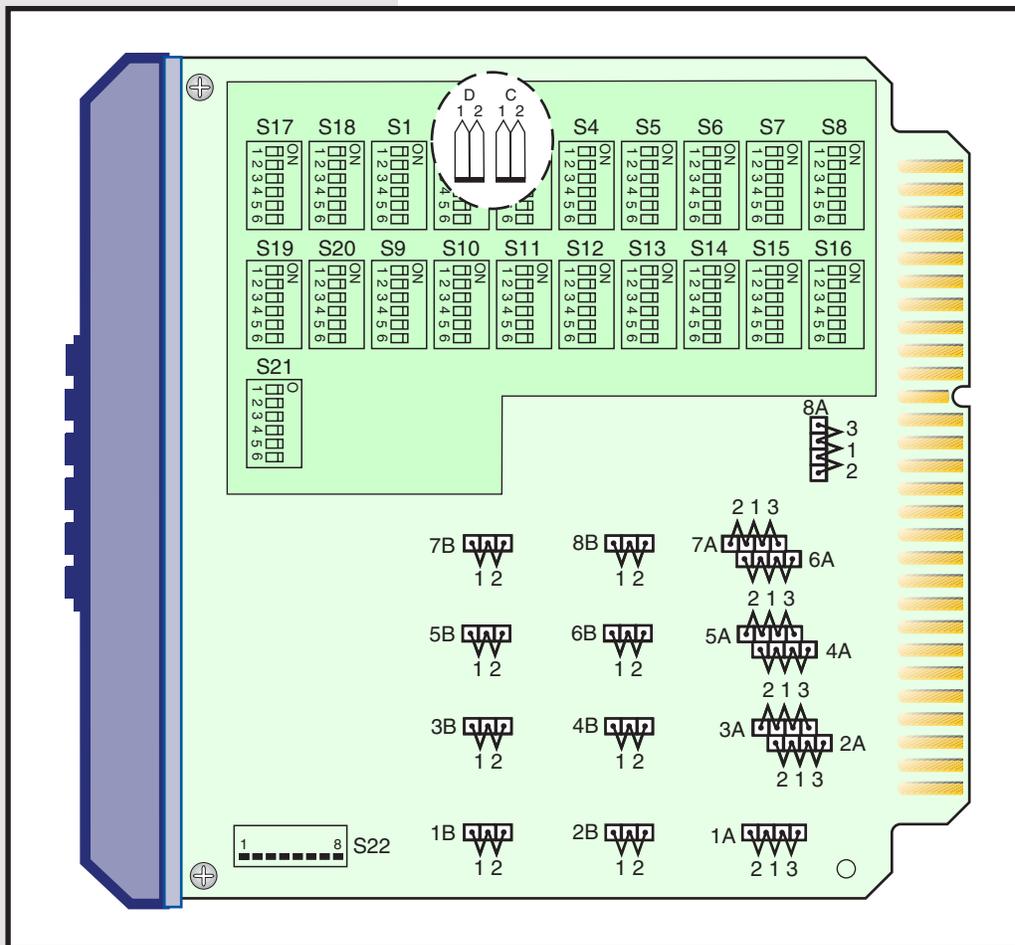
INSTALLATION

TABLE C - STRAP OPTIONS

OPTION	STRAP	POSITION
DATA PORTS 1 THROUGH 8		
Receive		
RS-232	1A through 8A	3
RS-422 unterminated	1A through 8A	1
RS-422 terminated	1A through 8A	2
Transmit		
RS-232	1B through 8B	1
RS-422	1B through 8B	2
COMMUNICATIONS SUBASSEMBLY		
Subassembly RTS Select		
Command RTS	C	1
RTS always ON	C	2
Subassembly Duplex Control		
Half-duplex	D	2
Full-duplex	D	1

DATA PORT NUMBER	SWITCH					
	BUS A	BUS B	BUS C	BUS D	BUS E	BUS F
Port 1						
Input	S1-1	S1-2	S1-3	S1-4	S1-5	S1-6
Output	S9-1	S9-2	S9-3	S9-4	S9-5	S9-6
Port 2						
Input	S2-1	S2-2	S2-3	S2-4	S2-5	S2-6
Output	S10-1	S10-2	S10-3	S10-4	S10-5	S10-6
Port 3						
Input	S3-1	S3-2	S3-3	S3-4	S3-5	S3-6
Output	S11-1	S11-2	S11-3	S11-4	S11-5	S11-6
Port 4						
Input	S4-1	S4-2	S4-3	S4-4	S4-5	S4-6
Output	S12-1	S12-2	S12-3	S12-4	S12-5	S12-6
Port 5						
Input	S5-1	S5-2	S5-3	S5-4	S5-5	S5-6
Output	S13-1	S13-2	S13-3	S13-4	S13-5	S13-6
Port 6						
Input	S6-1	S6-2	S6-3	S6-4	S6-5	S6-6
Output	S14-1	S14-2	S14-3	S14-4	S14-5	S14-6
Port 7						
Input	S7-1	S7-2	S7-3	S7-4	S7-5	S7-6
Output	S15-1	S15-2	S15-3	S15-4	S15-5	S15-6
Port 8						
Input	S8-1	S8-2	S8-3	S8-4	S8-5	S8-6
Output	S16-1	S16-2	S16-3	S16-4	S16-5	S16-6

TABLE D (CONTINUED)- SWITCH SETTINGS

DATA PORT NUMBER	SWITCH					
	BUS A	**BUS B**	**BUS C**	**BUS D**	**BUS E**	**BUS F**
Port 9 (subassembly)						
RXD	S17-1	S17-2	S17-3	S17-4	S17-5	S17-6
RTS	S18-1	S18-2	S18-3	S18-4	S18-5	S18-6
TXD	S19-1	S19-2	S19-3	S19-4	S19-5	S19-6
DCD	S20-1	S20-2	S20-3	S20-4	S20-5	S20-6
CTS	S21-1	S21-2	S21-3	S21-4	S21-5	S21-6

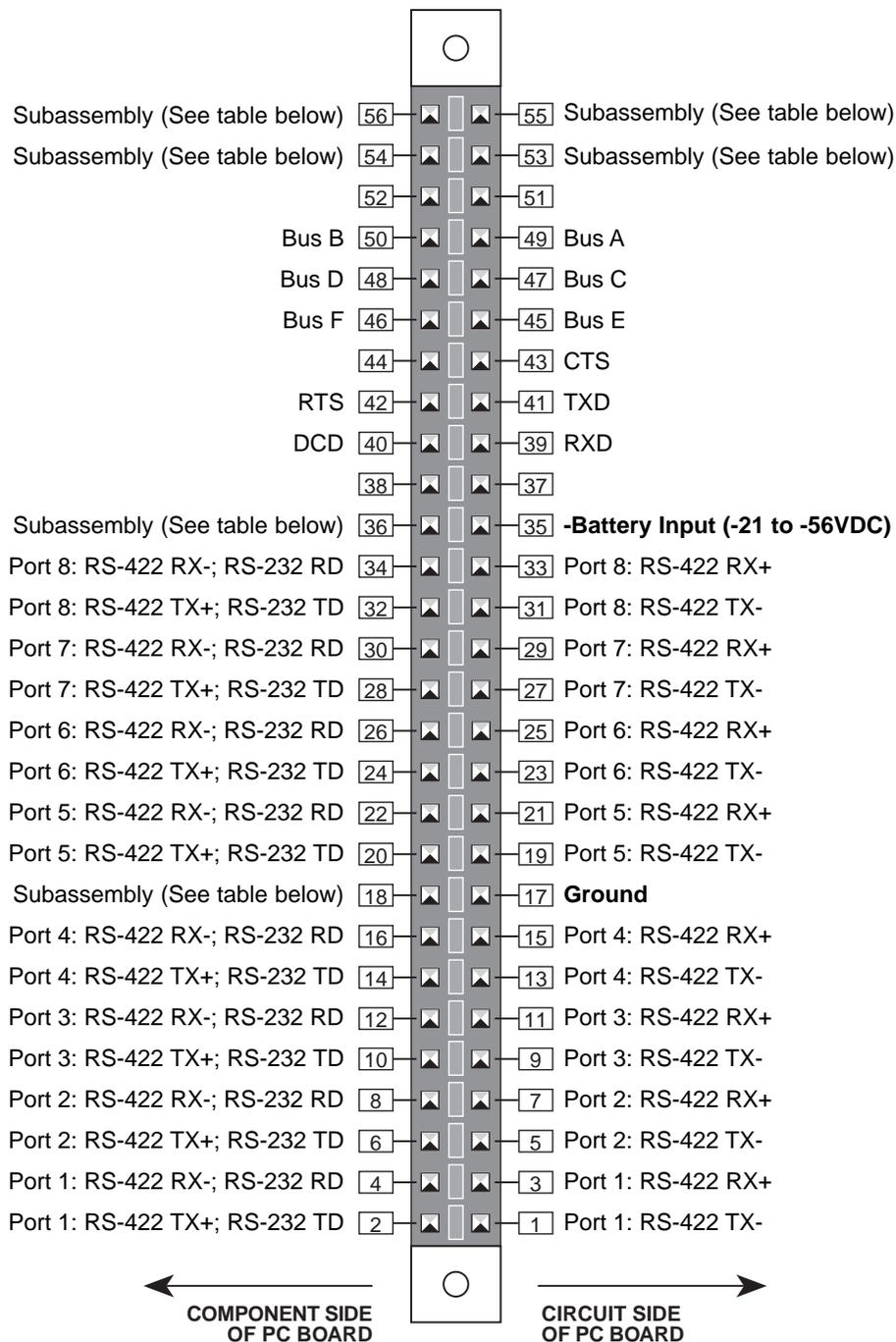| **DUPLEX ON PORTS 1-8**			
PORT	**SWITCH**	**PORT**	**SWITCH**
Port 1		Port 5	
Full-duplex	S22-8 OFF	Full-duplex	S22-4 OFF
Half-duplex	S22-8 ON	Half-duplex	S22-4 ON
Port 2		Port 6	
Full-duplex	S22-7 OFF	Full-duplex	S22-3 OFF
Half-duplex	S22-7 ON	Half-duplex	S22-3 ON
Port 3		Port 7	
Full-duplex	S22-6 OFF	Full-duplex	S22-2 OFF
Half-duplex	S22-6 ON	Half-duplex	S22-2 ON
Port 4		Port 8	
Full-duplex	S22-5 OFF	Full-duplex	S22-1 OFF
Half-duplex	S22-5 ON	Half-duplex	S22-1 ON

3. Wire the connector.

The 56-pin connector is usually prewired at the factory. If you wire the connector, refer to Fig. 8 for the module connector pin wiring assignments.

4. Install the module in the shelf.

FIG. 8 - 46044 HUBBING MODULE PIN DESIGNATIONS

Component Side		Circuit Side
Subassembly (See table below)	56	55 Subassembly (See table below)
Subassembly (See table below)	54	53 Subassembly (See table below)
	52	51
Bus B	50	49 Bus A
Bus D	48	47 Bus C
Bus F	46	45 Bus E
	44	43 CTS
RTS	42	41 TXD
DCD	40	39 RXD
	38	37
Subassembly (See table below)	36	35 **-Battery Input (-21 to -56VDC)**
Port 8: RS-422 RX-; RS-232 RD	34	33 Port 8: RS-422 RX+
Port 8: RS-422 TX+; RS-232 TD	32	31 Port 8: RS-422 TX-
Port 7: RS-422 RX-; RS-232 RD	30	29 Port 7: RS-422 RX+
Port 7: RS-422 TX+; RS-232 TD	28	27 Port 7: RS-422 TX-
Port 6: RS-422 RX-; RS-232 RD	26	25 Port 6: RS-422 RX+
Port 6: RS-422 TX+; RS-232 TD	24	23 Port 6: RS-422 TX-
Port 5: RS-422 RX-; RS-232 RD	22	21 Port 5: RS-422 RX+
Port 5: RS-422 TX+; RS-232 TD	20	19 Port 5: RS-422 TX-
Subassembly (See table below)	18	17 **Ground**
Port 4: RS-422 RX-; RS-232 RD	16	15 Port 4: RS-422 RX+
Port 4: RS-422 TX+; RS-232 TD	14	13 Port 4: RS-422 TX-
Port 3: RS-422 RX-; RS-232 RD	12	11 Port 3: RS-422 RX+
Port 3: RS-422 TX+; RS-232 TD	10	9 Port 3: RS-422 TX-
Port 2: RS-422 RX-; RS-232 RD	8	7 Port 2: RS-422 RX+
Port 2: RS-422 TX+; RS-232 TD	6	5 Port 2: RS-422 TX-
Port 1: RS-422 RX-; RS-232 RD	4	3 Port 1: RS-422 RX+
Port 1: RS-422 TX+; RS-232 TD	2	1 Port 1: RS-422 TX-

COMPONENT SIDE OF PC BOARD ← → CIRCUIT SIDE OF PC BOARD

INTERFACE	PIN 56	PIN 55	PIN 54	PIN 53	PIN 36	PIN 18
RS-422	RX+	RX-	TX+	TX-	-	-
RS-232	RD	DTR*	GND/CTS*	TD	RTS	DCD
202 Tone	RCV	RCV	XMT	XMT	DIST XMT	DIST RCV
* Available for 49029-00 subassembly only.						

OPERATION

Operation of the 46034 Hubbing Module consists of observing the 20 front panel LEDs that indicate the activity of all 9 ports. Refer to Fig. 9.

The first eight LEDs, labeled RX1 to RX8 respectively, indicate receive (RX) activity for data ports one through eight.

The next eight LEDs, labeled TX1 to TX8 respectively, indicate transmit (TX) activity for data ports one through eight.

The next two LEDs are not labeled and do not function.

The last two LEDs, labeled RXD and TXD, indicate data transmit (TXD) and data receive (RXD) activity for the communications subassembly (port nine).
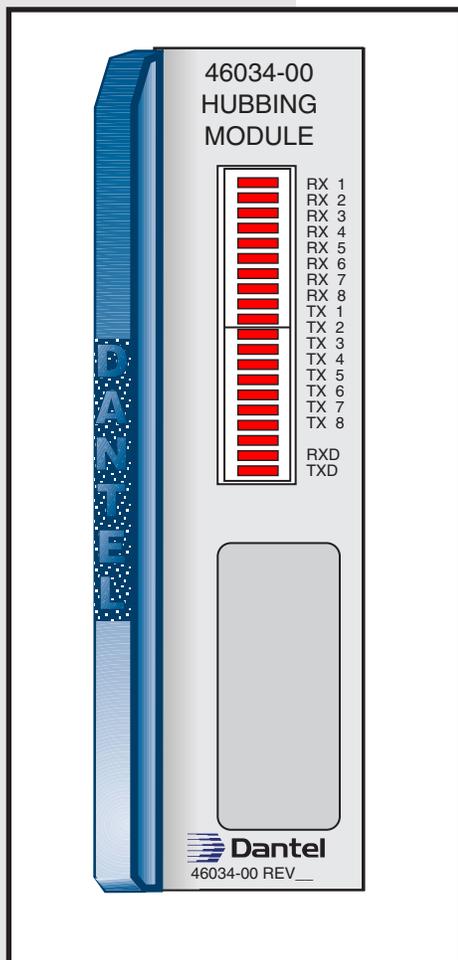
DESCRIPTION	VALUE
Input Voltage	-21 to -56 VDC

Input Power (full load; no subassembly)
   @ -24 VDC
   @ -48 VDC
	
	64.0 mA
	80.0 mA

Heat Dissipation (full load; no subassembly)
   @ -24 VDC
   @ -48 VDC
	
	5.2 BTU/Hr
	13.1 BTU/Hr

Physical Dimensions	1.4" x 6.0" x 5.6"
Weight	10 ounces
Operating Temperature Range	0° to 60° C.
Data Inputs and Outputs	EIA Standards for RS-232 and RS-422

WARRANTY

LIMITED WARRANTY

The Seller warrants that the standard hardware products sold will be free from defects in material and workmanship and perform to the Seller's applicable published specifications for a period of 18 months for hardware, and 3 months for software, from the date of the original invoice. The liability of the Seller hereunder shall be limited to replacing or repairing, at its option, any defective products which are returned F.O.B. to the Seller's plant, (or, at the Seller's option, refunding the purchase price of such products). In no case are products to be returned without first obtaining permission and a customer return authorization number from the Seller. In no event shall the Seller be liable for any consequential or incidental damages.

Equipment or parts which have been subject to abuse, misuse, accident, alteration, neglect, unauthorized repair or installation are not covered by warranty. The Seller shall make the final determination as to the existence and cause of any alleged defect. No warranty is made with respect to custom equipment or products produced to the Buyer's specifications except as specifically stated in writing by the Seller in the contract for such custom equipment.

This warranty is the only warranty made by the Seller with respect to the goods delivered hereunder, and may be modified or amended only by a written instrument signed by a duly authorized officer of the Seller and accepted by the Buyer.

Warranty and remedies on products not manufactured by the Seller are in accordance with warranty of the respective manufacturer. THE SELLER MAKES NO OTHER WARRANTY OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED; AND ALL IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEEDS THE AFORESAID OBLIGATIONS IS HEREBY DISCLAIMED BY THE SELLER.

IN CASE OF DIFFICULTY

If you experience difficulty with this equipment, check the following, as appropriate:

1. **Switch settings**
2. **Signal levels**
3. **Software configuration**
4. **Connections between Dantel's equipment and your equipment.**

If there is still a problem, substitute equipment that is known to be good. For additional assistance, call Dantel's Technical Field Service Department weekdays, 6 A.M. to 5 P.M. pacific time:

1-800-4DANTEL (1-800-432-6835).

If a thorough checkout shows a piece of equipment has malfunctioned, you may return it to the factory. For repairs and emergency replacements, obtain a Return Material Authorization (RMA) number from the Customer Service Representative at **1-800-4DANTEL** (1-800-432-6835).

To ensure expedient processing of your order, provide a purchase order number and shipping and billing information when requesting an RMA number. Also, when the units are returned to Dantel, include a description of the failure symptoms for each unit returned. Send defective equipment to:

Dantel, Inc. • 2991 North Argyle Avenue • Fresno, California 93727-1388

Dantel

P.O. Box 55013 • Fresno, CA 93747-5013   Phone (209) 292-1111   Fax (209) 292-9355   http://www.dantel.com