

MICROTERM[®]

INSTALLATION MANUAL



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A NAPCO SECURITY GROUP COMPANY

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which the user will be required to correct the interference at his own expense.

Shielded cables must be used with this unit to ensure compliance with the Class A FCC limits.

"This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications."

Le present appareil numerique n' émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numeriques de la class A prescrites dans le Règlement sur le brouillage radioélectriques edicté par le ministere des Communications du Canada.

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The installation of this product should be made by qualified service personnel and should conform to all local codes.



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVERS (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

WARNING

To reduce the risk of fire or shock hazard, do not expose this product to rain or moisture.

Warning: This product generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this product in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

UNPACKING AND INSPECTION

Unpack carefully. This is an electronic product and should be handled as such. Compare the items received with the packing list with your order.

Be sure to save:

1. The shipping cartons and insert pieces. They are the safest material in which to make future shipments of the product.
2. The IMPORTANT SAFEGUARDS sheet.
3. These Installation and Operating Instructions.

MAINTENANCE

User maintenance of this unit is limited to external cleaning and inspection. For specific recommendations refer to the IMPORTANT SAFEGUARDS sheet packaged with this product.

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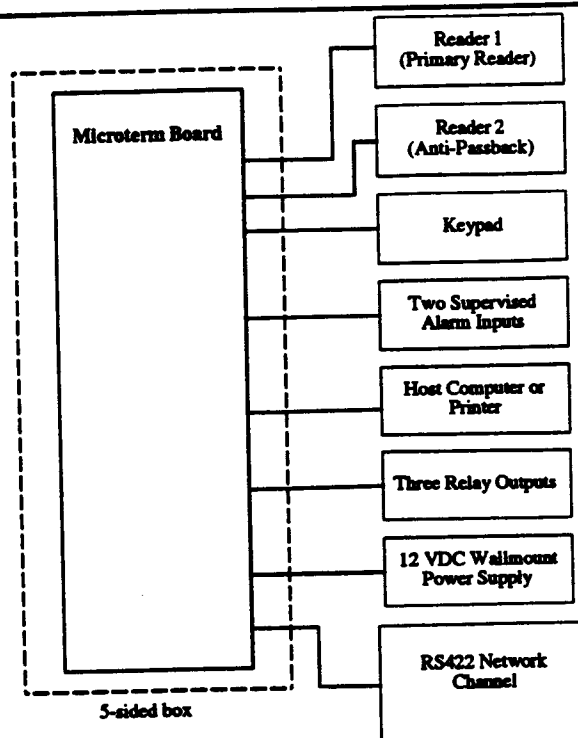


Figure 1 - Microterm System Block Diagram

Continental Microterm Access Control System

Installation Overview

The Microterm Access Control System is a stand-alone, single door access control system. Built as a self-contained intelligent controller, the Microterm is housed in a surface-mount box enclosure.

The Microterm Intelligent Controller consists of the Microterm printed circuit board and a single 12VDC power supply which powers the Microterm, readers, and a door strike. The Microterm comes with an on-board buzzer and tamper switch.

All other necessary items such as door contacts, cables/wires, supervised alarm resistors, connectors, and additional system components need to be purchased separately.

Additional System Components

In addition to the Microterm Controller, a Microterm Access Control System allows for integration and control of the following components:

- Two Supervised Alarms
- Two Readers (one primary, one anti-passback)
- One Host Computer or Printer
- Three Relay Outputs
- One Keypad

The Microterm may be networked together with other Microterms by using the RS-422 channel. The Microterm may also be networked with Continental Instruments Miniterm, Smarterm, and Superterms.

A diagram of a complete system is shown in Figure 1.

Features

- ***Complete, Self-Contained System***

Microterm operates directly at the door as a complete system without a separate or remote control panel. Microterm contains a user-programmable CPU. Two inputs and three outputs are provided for functions such as door lock relay, contact monitoring and shunt, request for exit, and alarm panel interface. The Microterm contains an on-board tamper switch.

- ***Reader Flexibility***

Microterm is able to interpret Wiegand, Magnetic Stripe, and Dallas Touch readers without any special interface.

- ***One Power Supply Operates Reader, Strike, and Microterm***

Only one 12VDC regulated power supply is required for reader, electronic strike, and Microterm operation. This unique feature makes Microterm easy and economical to install. A complete system includes Microterm, readers, and strikes and can be battery-backed for full operation with a UPS power supply.

Note: The door strike **MUST** draw less than 0.9 amps.

- ***Protected Memory***

The entire CPU and memory is protected with an on-board Lithium battery. In the event of a complete system battery backup failure, Microterm will not lose its data base of card holders and system operating instructions. Upon the return of power, Microterm will be instantly operational.

- ***Anti-Passback with Second Reader***

Microterm has a second port allowing installation of a second reader at the door for anti-passback configuration of "in-out" control. This feature can be used for applications such as parking control, high security locations, and doctors' registry, etc.

- ***Networking and Modem Operation***

The Microterm has the capability for networking and dial-up remote programming/monitoring.

This manual is a guide to installing and configuring the Microterm Access Control System.

Shipping Carton Contents

The Microterm Access Control System consists of one Microterm Intelligent Access Control Box.

Unpacking and Inspection

Microterm Intelligent Access Control Box

This box contains:

- One Microterm board mounted in an enclosure
- One 12VDC wallmount power supply
- One 15-conductor wiring harness
- Installation and Operating manuals
- Three programming guide sheets
- Warranty Card

First, remove the manuals and warranty card.

Carefully remove the Microterm and the protective wrapping material. When ready for installation, remove the anti-static wrapping.

Keep the carton and protective material for use in transporting the Microterm, or if required, to return the Microterm to the factory.

Familiarize yourself with the Microterm, its components, and system assembly by reading this manual.

Inspection

Thoroughly examine the Microterm for signs of damage. Immediately report any damage to the carrier and to Continental Instruments. If it's necessary to return the unit, use the Factory Repair form included in this manual, page 40.

In the event that technical support becomes necessary, be sure to fill out a copy of the Troubleshooting Checklist found on page 41.

**COMPLETE THE WARRANTY CARD
THE UNIT IS NOT COVERED UNDER
WARRANTY UNLESS THE WARRANTY
CARD IS COMPLETED AND MAILED.**

Required Tools

In addition to normal installation equipment, the following tools are required:

- 2.4mm flathead screwdriver (or equivalent)

Required Cables and Wires

The following cables and wires may be required for a Microterm installation. Refer to the Specification section for cable and wire details. Some cables are optional depending on the system configuration.

- Power Supply wires (may be required to extend wall mount supply wires)
- Earth/Ground wire
- Alarm Cables
- Reader Cables
- RS-232 Communication Cable (required for stand-alone and the first Microterm in a network)
- RS-422 Communication Cables (used with networked Microterms)
- Keypad Cable
- Relay Wires
- Door Strike Power Wire (required if Microterm 12VDC Power Supply is used to provide strike power.)

Note

RS-422 Communication cables must be twisted pair.
All other cables must not be twisted pair.

Additional Materials

The following materials may also be required during installation.

- Door Contacts
- 1K ohm resistors for supervised alarms (two resistors per alarm) See Figure 13.
- Epoxy for mounting and securing supervised alarm resistors
- DB9-S connector for host computer/PC operation
- DB25-P connector for printer operation

Note: Some computers and printers may contain different types of connectors!

Location Planning

Figure 2 reflects a typical Microterm location and setup.

Use Figure 2 to help decide where to place the Microterm and how to plan for proper installation.

Perform the following procedures, detailed in the subsequent pages, prior to wiring and installing the Microterm. Doing these required procedures assures proper operation of the unit. Mounting the Microterm at eye level makes wiring and maintenance easier.

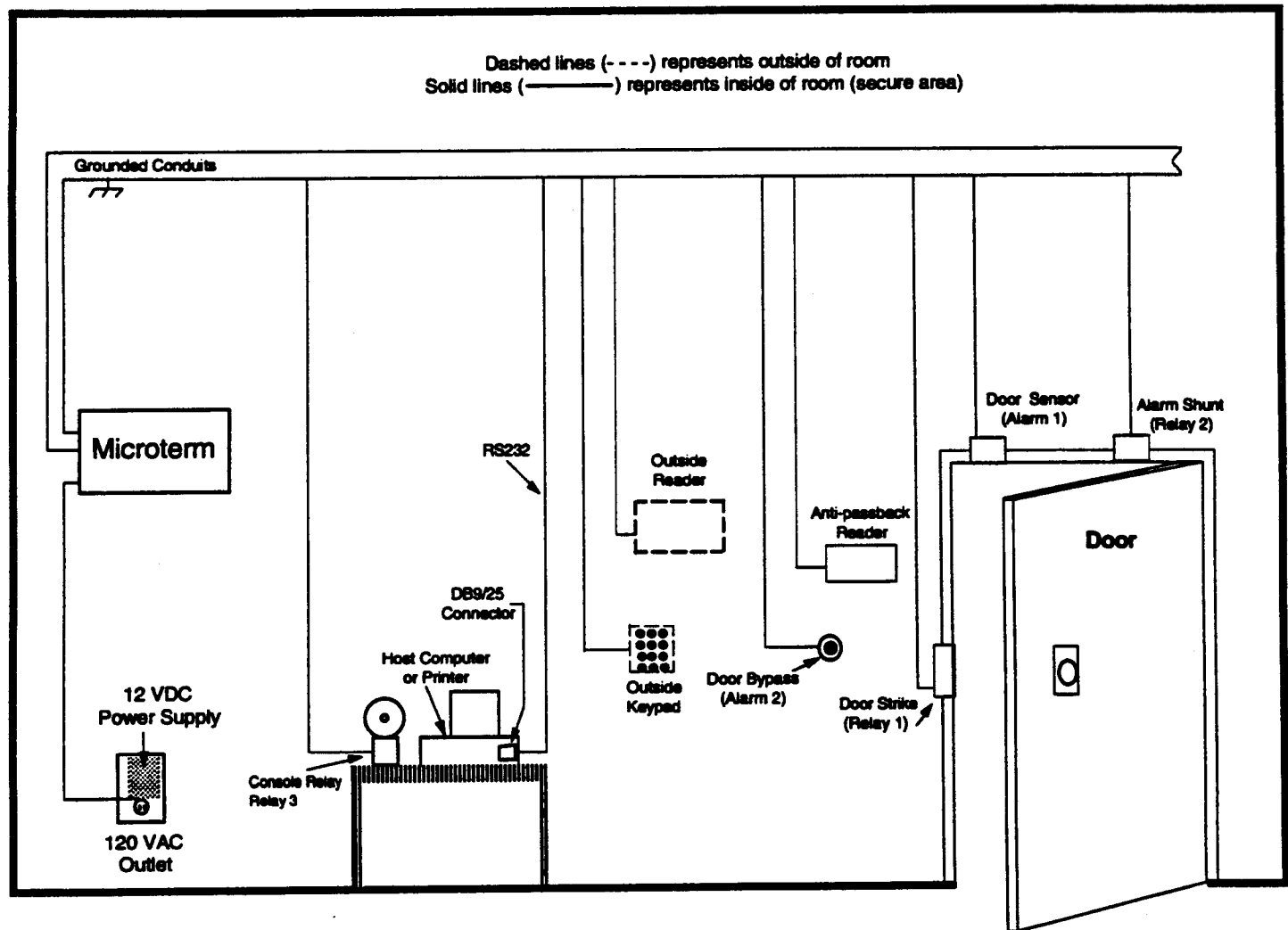


Figure 2 - Typical Microterm Setup

Consider the Following:

1. Locate a plug-in 120VAC power source close to the unit. This is needed for the plug-in 12VDC transformer. **Locate the power supply inside the protected area.**
2. Install the Microterm within a protected area.
3. If using door position monitoring contacts, install them on top of the door and on the corner opposite the door hinges. Plan to run a 2-conductor cable from the contacts to the Microterm.
4. Install the electronic strike in the frame or mullion wired back to relay/power on the Microterm.
5. If door contacts are used, install a door bypass (Request to Exit) button or other normally open device and run two conductors from inside the protected area to the Microterm.
6. If a previously installed alarm system is monitoring the door, wire a shunt relay from the door alarm contact to the Microterm.

Microterm Mounting

1. Drill four holes corresponding to the four mounting key holes as illustrated in Figure 3, Microterm Enclosure Dimensions.
2. If necessary, insert the wall anchors into the mounting surface.
3. Partially insert the screws (or bolts) into the holes.
4. Hang the Microterm on the four screws and then once positioned correctly, tighten the screws.

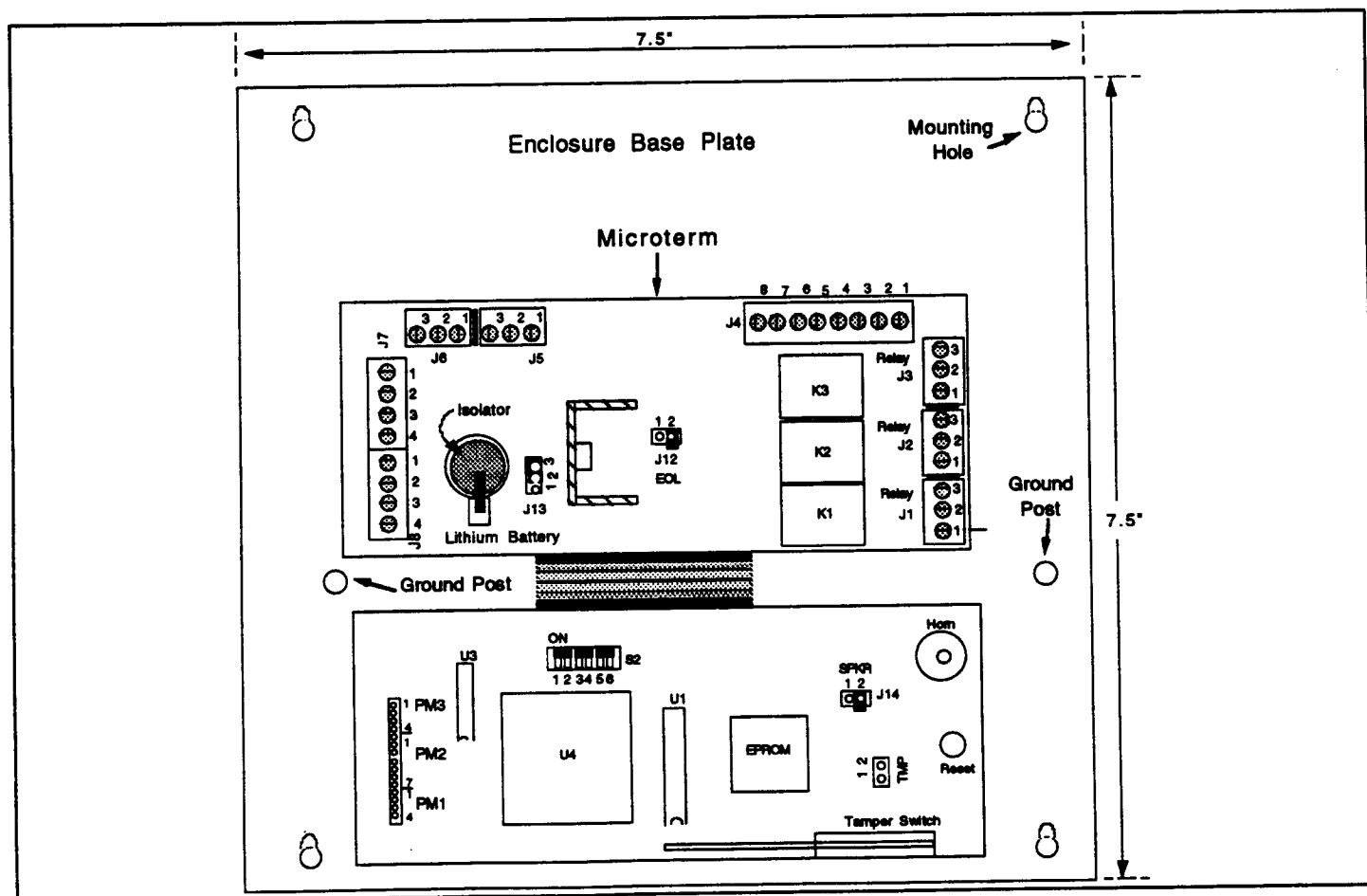


Figure 3 - Microterm Enclosure Dimensions

Cable and Wire Routing

1. Communication, Alarm, and Reader cables **MUST** be laid in grounded conduit, and **MUST** be separated from Power and Relay wires.
2. Power and Relay wires **MUST** also be laid in grounded conduit separate from Communication, Alarm, and Reader cables.
3. Use an 18AWG ground wire to connect the Microterm to Earth/Ground.
4. All wiring must conform to National Electric Code (NEC), NFPA 70, as well as any local electrical codes.

Do not connect power until the Microterm is mounted, fully wired, and configured.

Installation Configuration

Perform the following procedures prior to wiring and installing the Microterm. Doing these required procedures assures proper operation of the unit.

WARNING

The Microterm printed circuit board may be accidentally damaged by an electrostatic discharge. Electrostatic charges may develop on your body when walking across a carpeted floor. Before touching the Microterm printed circuit board always touch an earth ground first.

Among other components, the Microterm contains three jumper blocks and one DIP switch which are used to control the communication and buzzer functions. These components may require adjustment before installation.

The three jumper blocks and one DIP switch are used to control the communication and buzzer functions.

Battery Activation

The Microterm contains a 3.0 volt Lithium battery (B1) used to preserve memory in the event of a power failure. Refer to Figure 4 for board layout.

The Microterm is shipped with a paper isolator between the battery and the battery holder to prevent unnecessary drainage.

1. Remove the paper isolator immediately before powering up the Microterm.

If the battery is not activated all user-programmed data will be lost if power is interrupted.

Jumper Settings (J12, J13, and J14)

EOL - The EOL (End-of-Line) jumper (J12) controls termination of the RS-422 network communication line. **Do not** connect pins 1 and 2 (Terminating resistor = Out) when the Microterm is used as a stand-alone unit.

To install the EOL terminating resistor, connect pins 1 and 2 with the jumper block.

Refer to Networking, page 26, for the networked use of the Microterm.

Note: As a convenience, if the terminating resistor is not installed, the jumper block may be stored on one of the pins on the EOL header.

J12 EOL Jumper ("End-of-Line" Termination)



1
2 IN



1
2 OUT (Jumper stored on EOL Header).

Figure 5 - J12 EOL Jumper

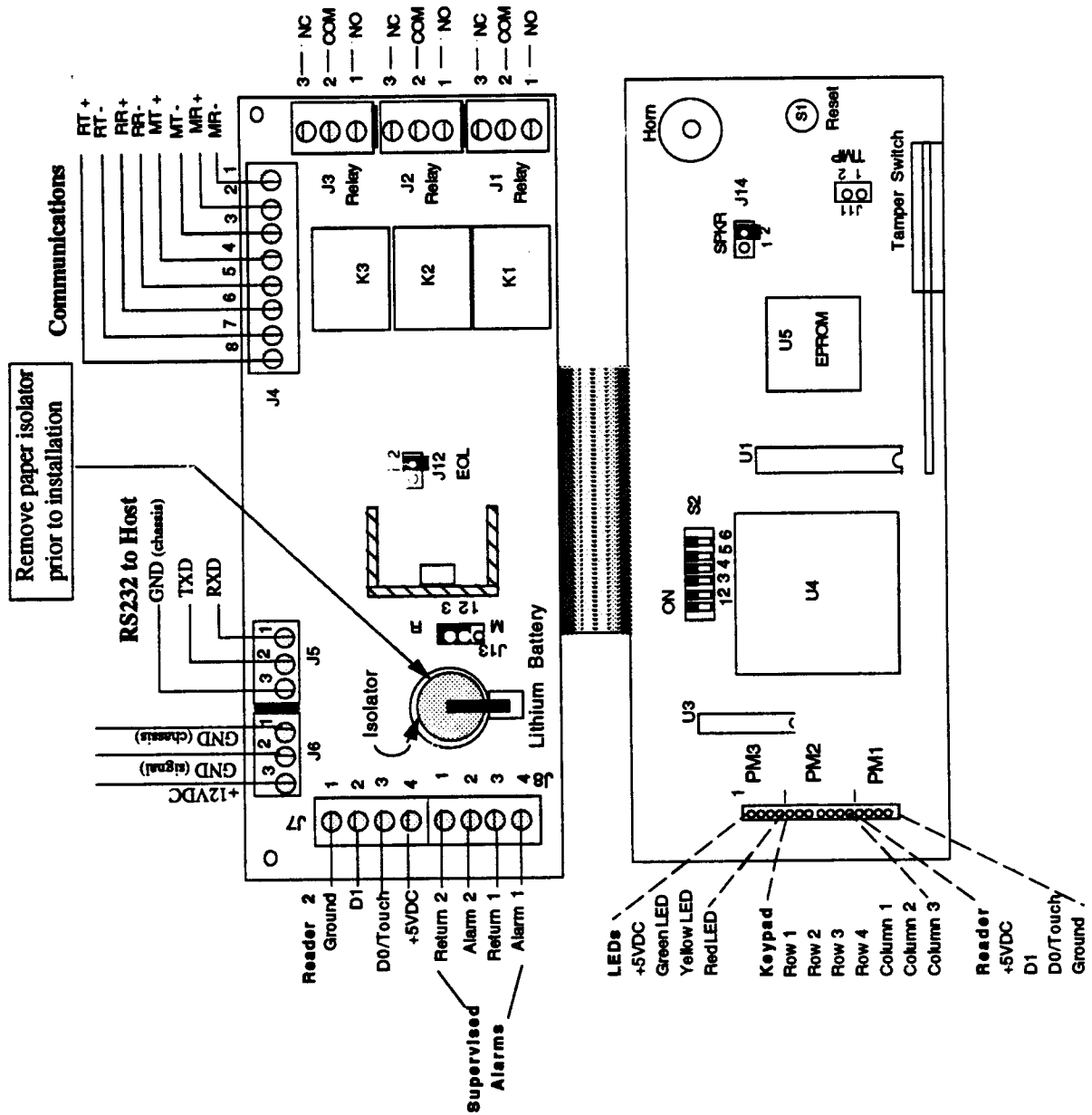


Figure 4 - Board Layout

MODE - The MODE jumper (J13) is used to select Repeat or Multidrop mode when the Microterm is installed in a network using the RS-422 channel.

Insert this jumper between pins 2 and 3 (Repeat Mode) for a stand-alone (single) Microterm.

Refer to Networking, page 26, for the networked use of the Microterm.

Address Switch Settings

The Microterm can be set to respond to 31 different addresses on the RS-232 communication channel. These addresses range from 1 to 31 and are set using switches 1-5 on DIP switch S2 (see Figure 4). Refer to the desired Microterm address in Table 1 (page 9) and set the DIP switches as indicated.

J13 MODE Jumper (Multidrop or Repeat Mode)

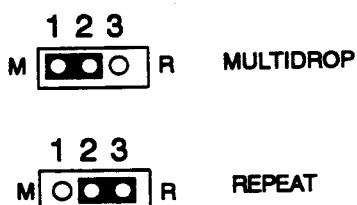


Figure 6 - J13 Mode Jumper

SPKR - Insert this jumper (J14) connecting pins 1 and 2 to enable the on-board buzzer. If enabled, the buzzer will sound whenever the Door Strike Relay is active.

Note: As a convenience, if the buzzer is not enabled, the jumper block may be stored on one of the pins on the SPKR header.

J14 SPKR Jumper (Enable Buzzer)

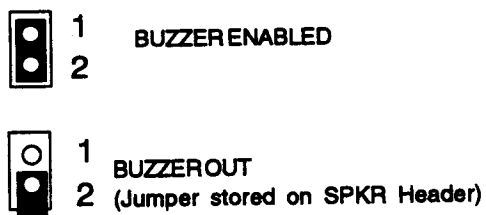


Figure 7 - J14 Speaker Jumper

TMP - No jumper is installed at this location. **Note:** J11 is not a jumper location; it is a connector for use if an external Tamper Switch is used. Microterms are supplied with an on-board Tamper Switch.

Note

For proper Microterm operation, set the DIP Switch S2 to an address value between 1 and 31. Address 0 is not valid and if set will clear all programmed data when the Reset button, S1, is pressed.

Position 6 on S2 is set to OFF when the Microterm is connected with a modem. When position 6 on S2 is set to OFF, the Microterm RS-232 channel operates at a 2400 baud rate.

Refer to Modem Operation, page 35, for use of a modem with the Microterm System. At all other times, set position 6 on S2 to the ON position.

Microterm Address DIP Switch S2					
Address	SW1	SW2	SW3	SW4	SW5
1	Off	On	On	On	On
2	On	Off	On	On	On
3	Off	Off	On	On	On
4	On	On	Off	On	On
5	Off	On	Off	On	On
6	On	Off	Off	On	On
7	Off	Off	Off	On	On
8	On	On	On	Off	On
9	Off	On	On	Off	On
10	On	Off	On	Off	On
11	Off	Off	On	Off	On
12	On	On	Off	Off	On
13	Off	On	Off	Off	On
14	On	Off	Off	Off	On
15	Off	Off	Off	Off	On
16	On	On	On	On	Off
17	Off	On	On	On	Off
18	On	Off	On	On	Off
19	Off	Off	On	On	Off
20	On	On	Off	On	Off
21	Off	On	Off	On	Off
22	On	Off	Off	On	Off
23	Off	Off	Off	On	Off
24	On	On	On	Off	Off
25	Off	On	On	Off	Off
26	On	Off	On	Off	Off
27	Off	Off	On	Off	Off
28	On	On	Off	Off	Off
29	Off	On	Off	Off	Off
30	On	Off	Off	Off	Off
31	Off	Off	Off	Off	Off

Table 1

Microterm Connections

The following sections describe the system component cable and wiring connections to the Microterm.

PM1/PM2/PM3 Wiring Harness

The Reader 1, Keypad, and LED control functions are connected to the Microterm using the PM1/PM2/PM3 connector (see Figure 8). This 15-pin connector is composed of three sections:

- PM1 - 4 pins for Reader 1 connections
- PM2 - 7 pins for Keypad connections
- PM3 - 4 pins for LED control lines

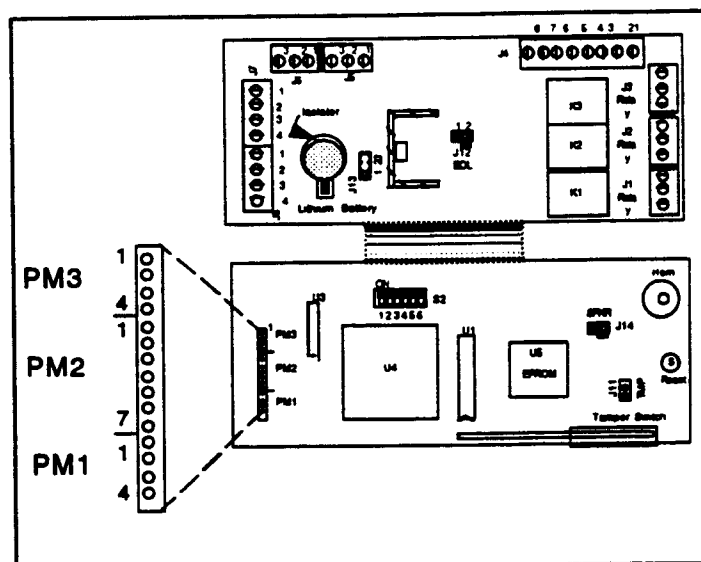
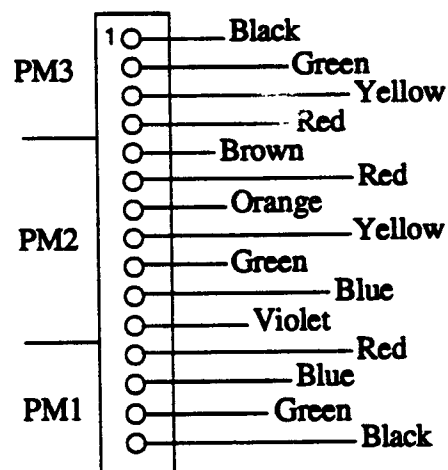


Figure 8 - 15 pin connector

In addition, the Microterm is supplied with a 15-conductor, 22AWG, 12-inch wiring harness. The harness is used when mating to the PM1/PM2/PM3 connector. Verify that pin 1 of the wiring harness is connected to pin 1 of the PM3 section on the Microterm.



Wiring Harness

To prevent shorts cut, or insulate with tape, any unused wires in the harness.

Reader 1

The Microterm can interface with the following types of readers for the Reader 1 function: Wiegand /Proximity, Magnetic Stripe, or Dallas Touch.

Use stranded 22 AWG cable with shielding and a drain wire for Reader 1 connections.

Connect the drain wire to Chassis/Earth ground at the Microterm enclosure ground post. Refer to Drain Wires, page 23.

The maximum cable length for Wiegand/Proximity and Magnetic Stripe readers is 800 feet from the Microterm to the reader. The maximum cable length for Dallas Touch readers is 300 feet from the Microterm to the reader.

The readers have color coded output wires described for Wiegand/Proximity, Magnetic Stripe, or Dallas Touch Readers. The readers have a maximum current draw of 50mA per reader (100mA total). If only one reader is used, the maximum current draw for the single reader is 100mA.

Note

It is recommended that Proximity Readers be powered by an external power source, not from the Microterm.

Connect the LED control line for the Wiegand /Proximity and Magnetic Stripe Readers to the "GREEN LED" output on pin 2 of the PM3 connector.

Note

PM3-2 may be used to drive both the Reader 1 and Reader 2 LEDs.

Wiegand/Proximity Reader 1 Connections

Refer to Figure 9 for Wiegand/Proximity Reader connections to the Microterm. Use a 5-conductor cable to connect the Wiegand/Proximity Reader to the Microterm.

Wiegand/Proximity used for Reader 1

Signal	Wiegand/Proximity Wire Color	Microterm Connector/Pin	Microterm Wire Color
+5VDC	Red	PM1-1	Red
Data 1	White	PM1-2	Blue
Data 0	Green	PM1-3	Green
Ground	Black	PM1-4	Black
LED	Brown	PM3-2	Green

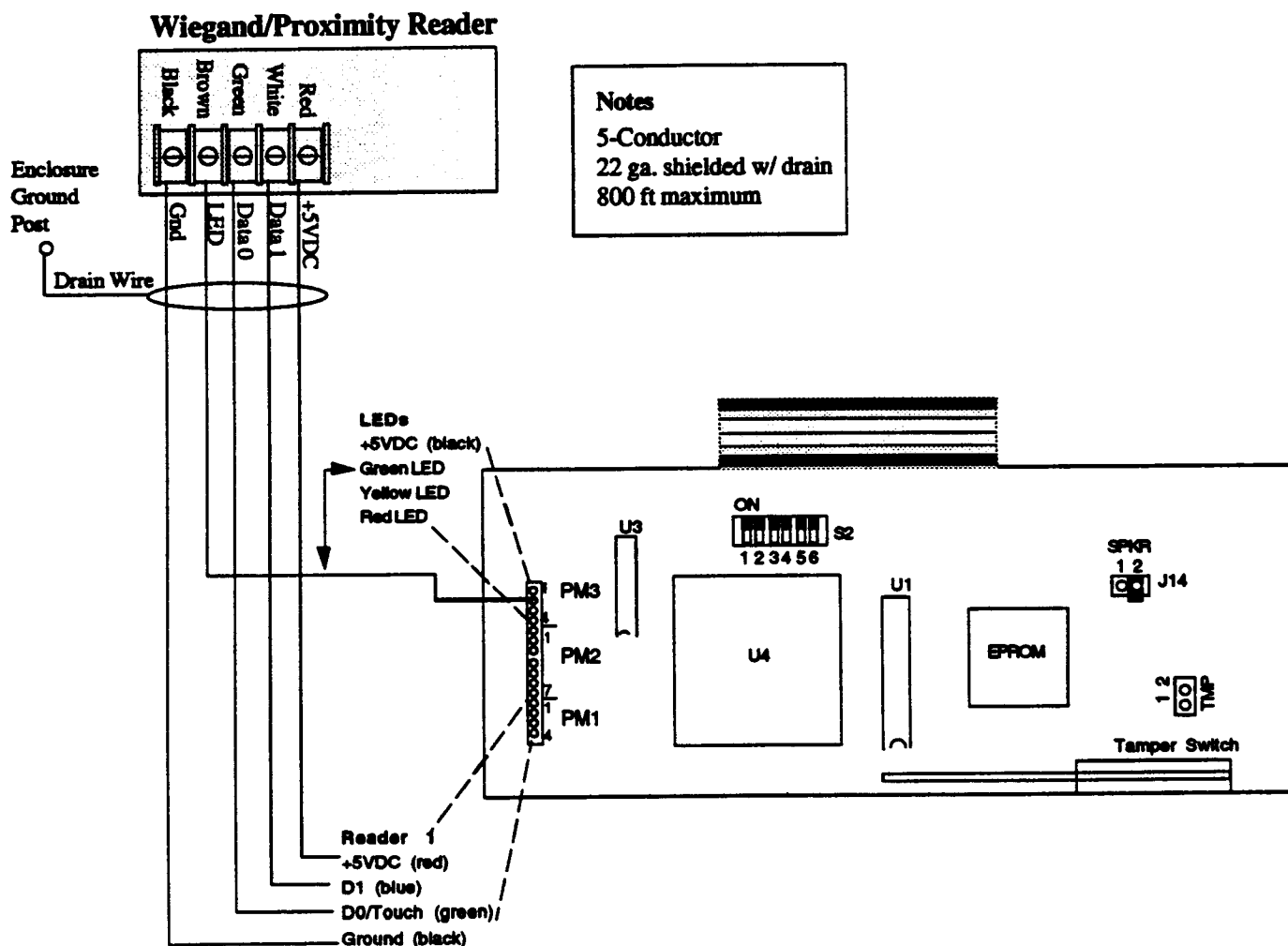


Figure 9 - Wiegand/Proximity used for Reader 1

Magnetic Stripe Reader 1 Connections

Refer to Figure 10 for Magnetic Stripe Reader connections to the Microterm. Use a 5-conductor cable to connect the Magnetic Stripe Reader to the Microterm. If the Microterm Stripe Readers does not have an LED, a 4-conductor cable may be used (disregard LED connection).

Magnetic Stripe used for Reader 1

Signal	Magnetic Stripe Wire Color	Microterm Connector/Pin	Microterm Wire Color
+5VDC	Red	PM1-1	Red
RDP	Blue	PM1-2	Blue
RCP	Green	PM1-3	Green
Ground	Black	PM1-4	Black
LED	Yellow	PM3-2	Green

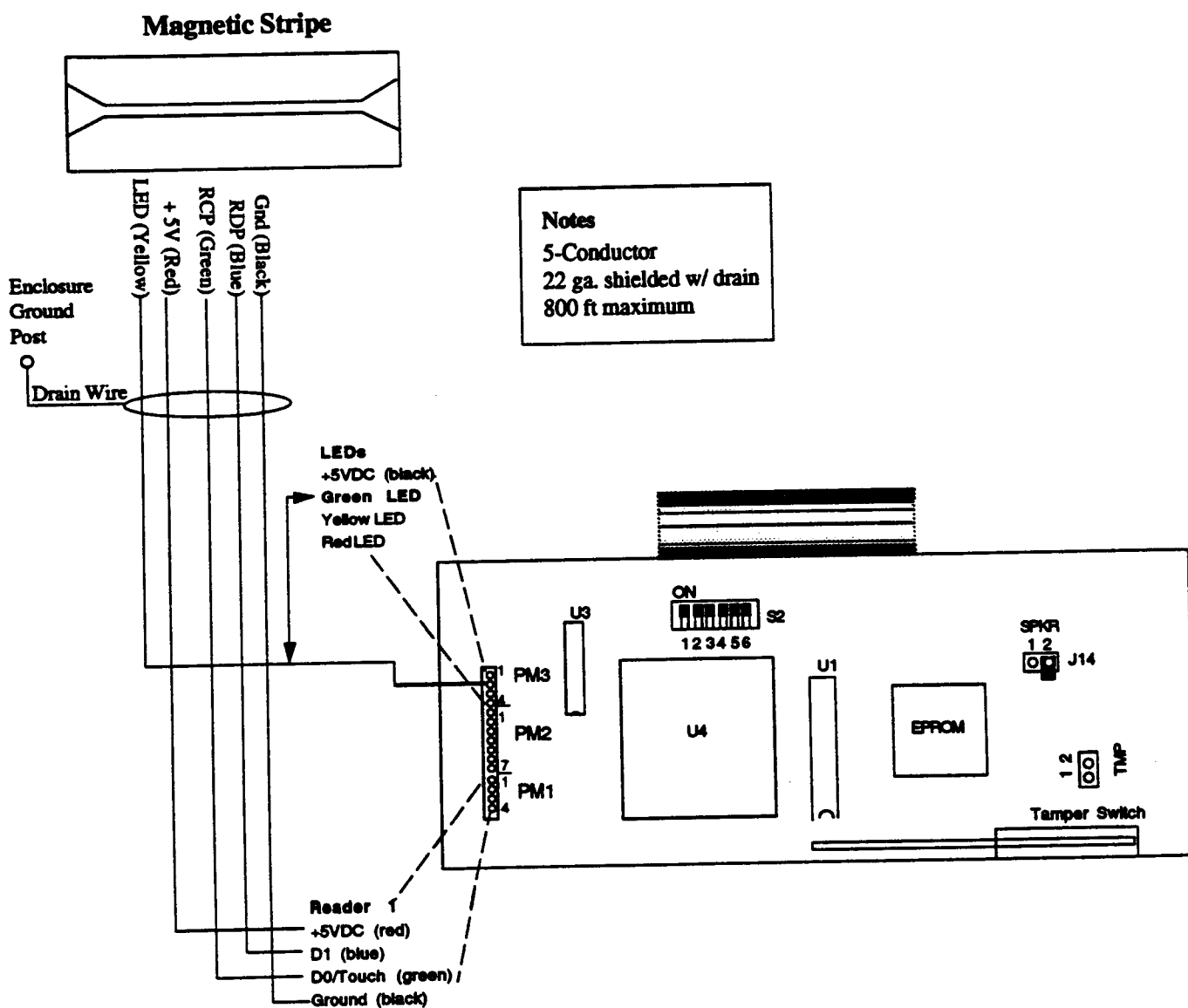


Figure 10 - Magnetic Stripe used for Reader 1

Dallas Touch Reader 1 Connections

Refer to Figure 11 for Dallas Touch Reader connections to the Microterm. Use a 2-conductor cable to connect the Dallas Touch Reader to the Microterm.

Dallas Touch used for Reader 1

Signal	Dallas Touch Wire Color	Microterm Connector/Pin	Microterm Wire Color
Data	Gray	PM1-3	Green
Ground	Black	PM1-4	Black

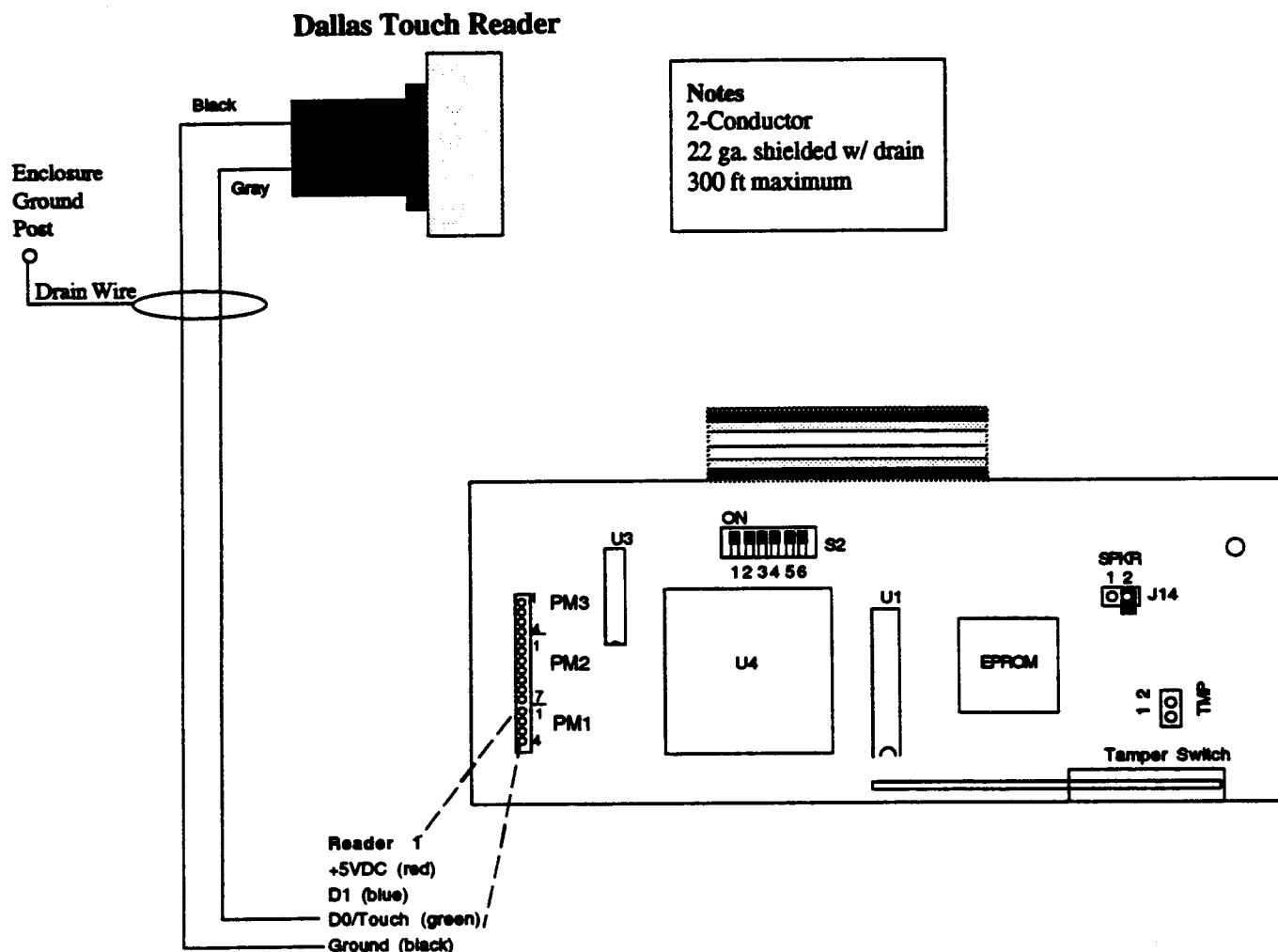


Figure 11 - Dallas Touch used for Reader 1

Keypad Connections

The Microterm can interface with a 3x4, 12-position keypad.

Use stranded 22 AWG cable with shielding and a drain wire for keypad connections. Connect the drain wire to Chassis/Earth ground at the Microterm enclosure ground post. Refer to Drain Wires, page 23.

Refer to Figure 12 for keypad connections to the Microterm. Maximum cable length between the keypad and the Microterm is 50 feet for the UL version Microterm. Use a 7-conductor cable to connect the keypad to the Microterm.

Keypad Connections

<u>Signal</u>	<u>Microterm Connector/Pin</u>	<u>Microterm Wire Color</u>
Row 1	PM2-1	Brown
Row 2	PM2-2	Red
Row 3	PM2-3	Orange
Row 4	PM2-4	Yellow
Column 1	PM2-5	Green
Column 2	PM2-6	Blue
Column 3	PM2-7	Violet

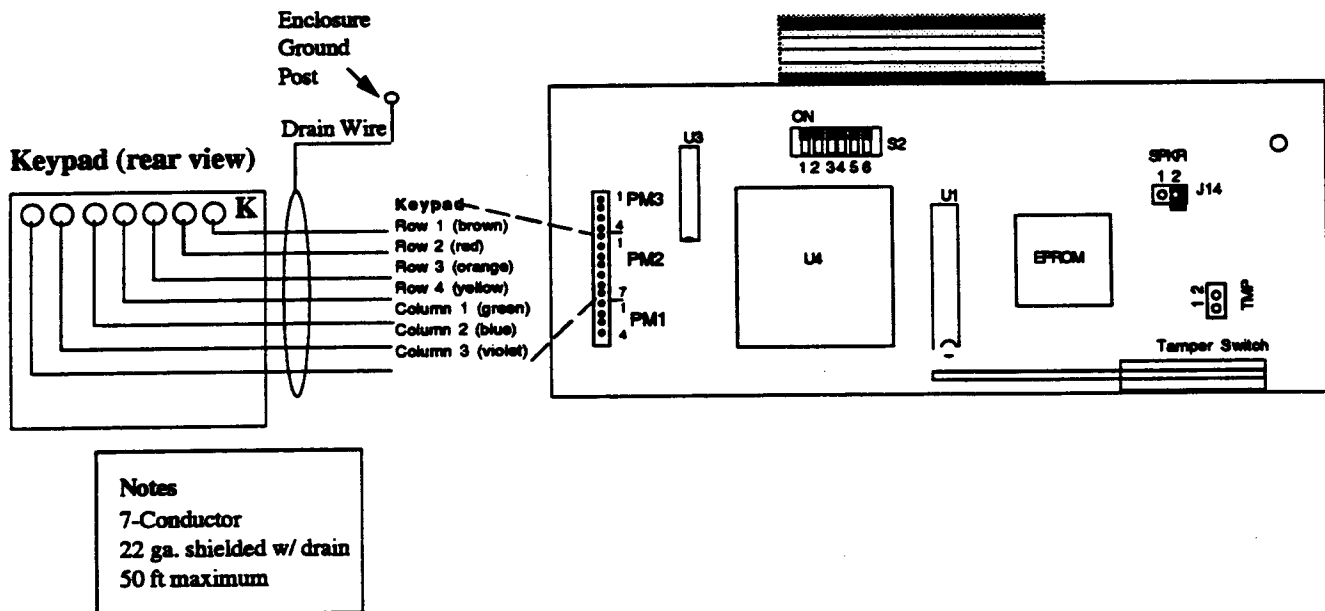


Figure 12 - Keypad Connections

Alarm Inputs

The Microterm can be configured for either Supervised Alarm Inputs or Non-Supervised Alarm Inputs. Use stranded 22 AWG cable with shielding and a drain wire.

Connect the drain wire to Chassis/Earth ground at the Microterm grounding post. Refer to Drain Wires, page 23.

Cables are restricted to a maximum length of 1000 feet between the Microterm unit and the alarm contacts.

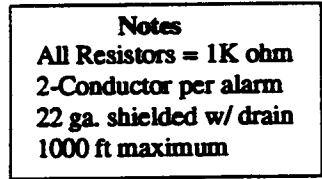
The alarm inputs are user-programmable; however, typical use for the two alarms are: Alarm 1 = Door Sensor ; Alarm 2 = Bypass (Request to Exit).

The alarm inputs have a maximum current draw of 3.4mA. Connect the alarms to the Microterm as described in Table 2.

Microterm - Alarm Connections

Signal	Microterm Connector/Pin	Microterm Pin Label	Typical Use
Alarm 1	J8-4	A1	Door Sensor
Alarm 1 Return	J8-3	R1	Door Sensor
Alarm 2	J8-2	A2	Bypass
Alarm 2 Return	J8-1	R2	Bypass

Table 2



Non-Supervised Alarms

To configure the alarms as non-supervised inputs, wire the alarm inputs directly to the appropriate Microterm connectors (Refer to Figure 14).

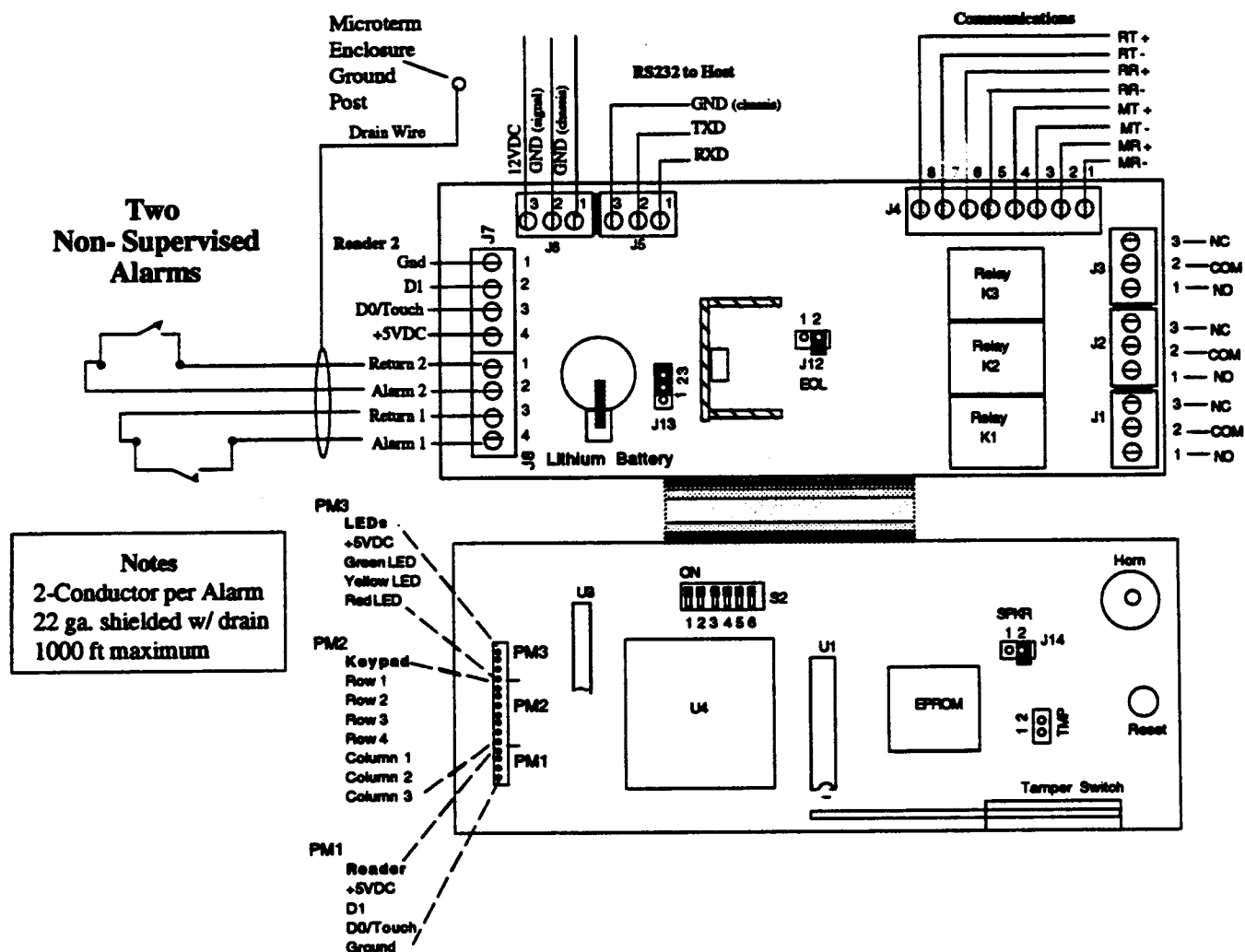


Figure 14 - Non Supervised Alarms

Reader 2 (Optional)

If desired, a second reader at the same door can be installed for anti-passback applications.

The Microterm can interface with the following types of readers for the Reader 2 function: Wiegand/Proximity, Magnetic Stripe, or Dallas Touch.

Use stranded 22AWG wire with shielding and a drain wire.

Connect the drain wire to Chassis/Earth ground at the Microterm enclosure ground post. Refer to Drain Wire instructions, page 23.

The maximum wire length for Wiegand/Proximity and Magnetic Stripe readers is 800 feet from the Microterm to the reader.

The maximum cable length for Dallas Touch readers is 300 feet from the Microterm to the reader.

The readers have color coded output wires described for Wiegand/Proximity, Magnetic Stripe, or Dallas Touch Readers. The readers have a maximum current draw of 50mA per reader. If only one reader is used, the maximum current draw for the single reader is 100mA.

Note

It is recommended that Proximity Readers be powered by an external power source, not from the Microterm.

Connect the LED control line for the Wiegand/Proximity and Magnetic Stripe Readers to the "green LED" output on pin 2 of the PM3 connector.

Note

PM3-2 may be used to drive both the Reader 1 and Reader 2 LEDs.

Wiegand/Proximity used for Reader 2

Refer to Figure 15 for Wiegand/Proximity reader connections to the Microterm. Use 5-conductor cable to connect the Wiegand/Proximity Reader to the Microterm Reader 2 connection.

Wiegand/Proximity used for Reader 2

<u>Signal</u>	<u>Wire Color</u>	<u>Connector/Pin</u>	<u>Pin Label</u>
+5VDC	Red	J7-4	5V
Data 0	Green	J7-3	0
Data 1	White	J7-2	1
Ground	Black	J7-1	G
LED	Brown	PM3-2	none

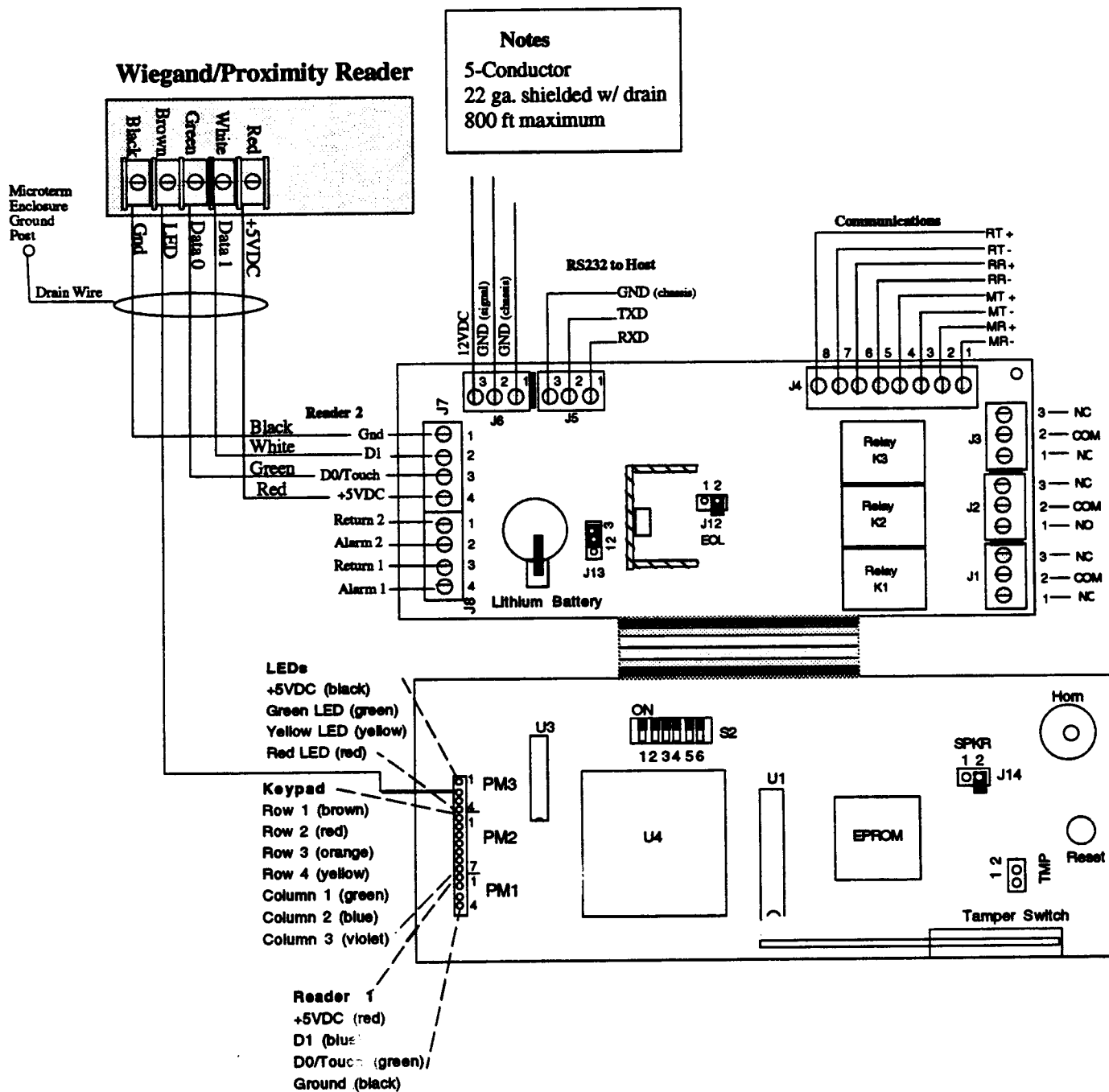


Figure 15 - Wiegand/Proximity used for Reader 2

	Mac Strips	Microterm	Microterm
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30

Dallas Touch used for Reader 2

Refer to Figure 17 for Dallas Touch reader connections to the Microterm. Use 2-conductor cable to connect the Dallas Touch Reader to the Microterm Reader 2 connection.

Dallas Touch used for Reader 2			
Signal	Dallas Touch Wire Color	Microterm Connector/Pin	Microterm Pin Label
Data	Gray	J7-3	0
Ground	Black	J7-1	G

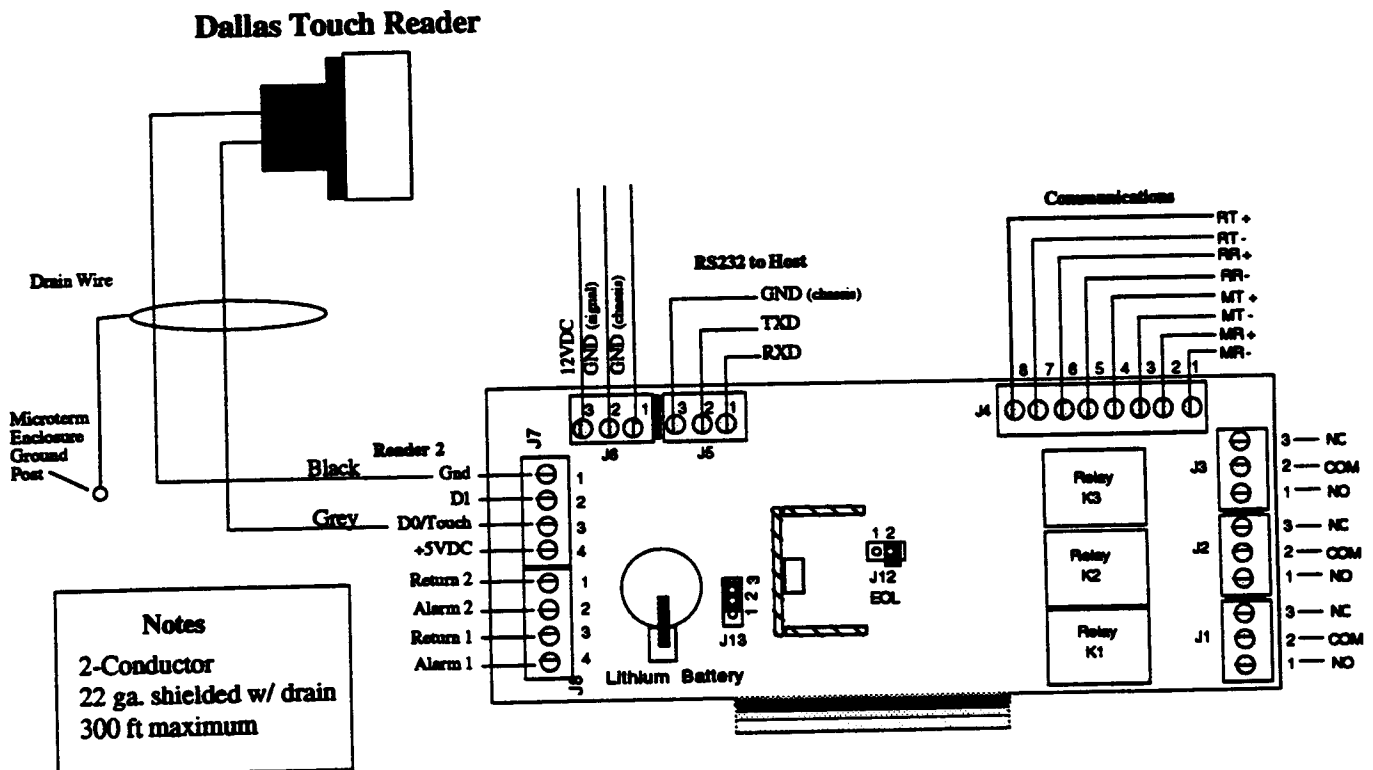


Figure 17 - Dallas Touch used for Reader 2

POWER REQUIREMENTS WARNING !!

Do not connect AC power until the Microterm is mounted, fully wired, and configured.

Power

The Microterm, as supplied by the factory, is powered by a 12VDC regulated wallmount power supply that requires a 120VAC outlet.

It is recommended that the Microterm be connected to a dedicated, **UNSWITCHED** power outlet. This will prevent any interference from other equipment which might be connected to that same line.

The power supply may also be used to power a 12VDC door strike, provided the strike draws less than 0.9 amps.

If the wallmount supply wires are not long enough, extend them using stranded 18AWG two-conductor wire. Wiring is restricted to a maximum length of 50 feet between the Microterm unit and the 120VAC outlet.

Power Supply Specifications

Voltage	Current		Power	
	Nom	Max	Nom	Max
12 VDC	100 mA	200 mA	1.2 W	2.4 W

Note: Values do not include strike power.

Wallmount Power Supply Connections to Microterm

Signal	Microterm Connector/Pin	Microterm PIN Label	Wallmount* Power Supply Wire Type
+12 VDC	J6-3	+	Smooth
Ground	J6-2	-	Ribbed
Earth Ground	J6-1	GD	N/A

CAUTION

**Before connecting the Power Supply wires to the Microterm, use a voltmeter to verify which wire is +12VDC and which is ground.*

Refer to Figure 18 for power and ground connections to the Microterm.

Figure 18 - Microterm Power and Ground Connections

Grounding

All grounding must conform to the National Electric Code (NEC), NFPA 70, and any local electrical codes.

Drain Wires

Cable shields, or drain wires, for specified cables (except RS-232), must be connected to the Microterm at the grounding posts located on the Microterm enclosure. Refer to Figure 19 for an example of cable grounding.

To connect the drain wires to the grounding post:

1. Remove approximately 2-3 inches of sleeving from the wires.
2. Pull aside the drain wires and wrap them tightly around the screw on top of the grounding post.
3. Secure the wires in place by tightening the screw.

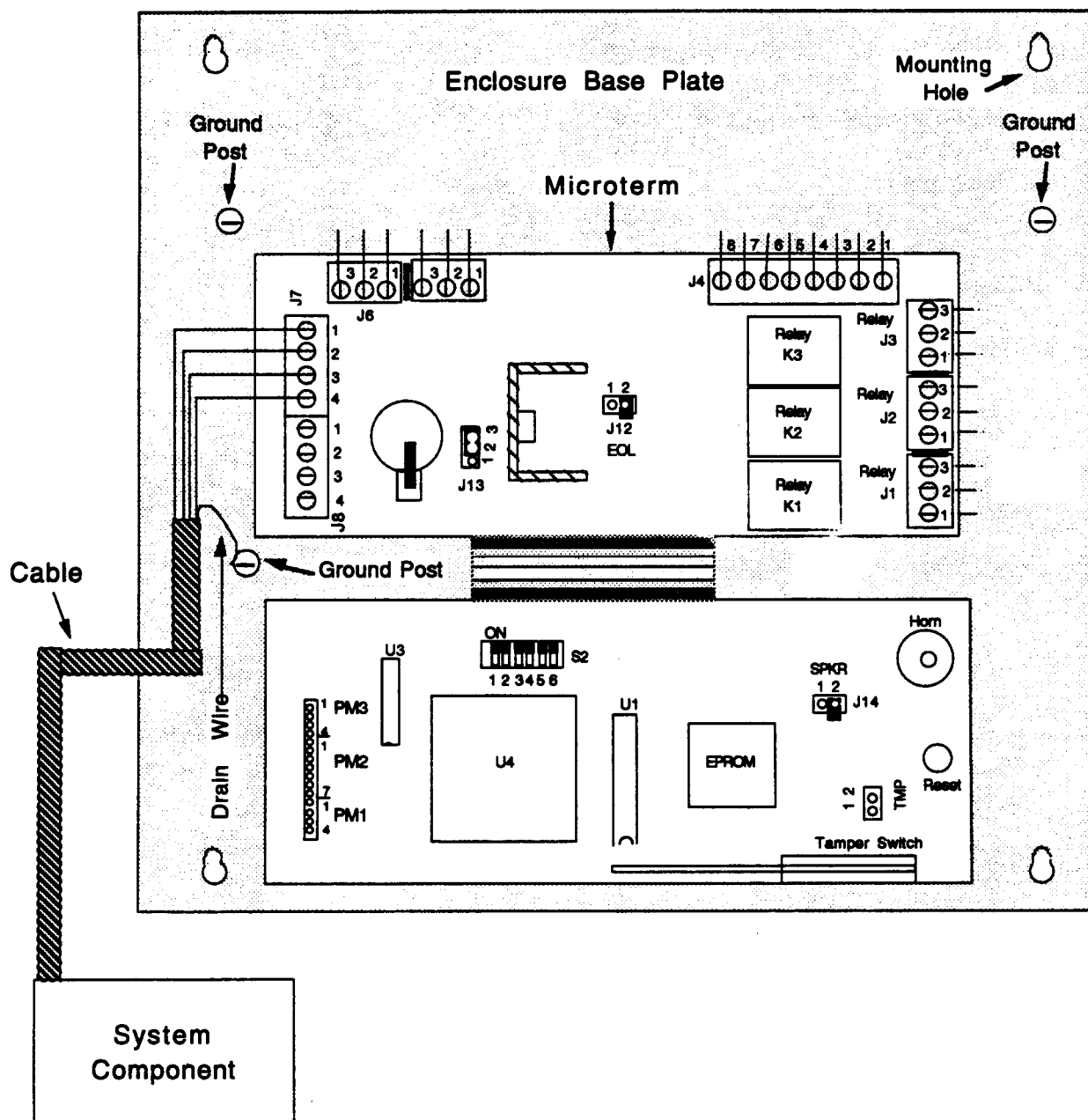


Figure 19 - Cable Grounding Connections

To avoid shorts, keep the drain wires as short as possible and away from the board components.

The remaining signal wires can then be routed to the proper Microterm connectors.

The RS-232 Communication wire must be grounded to Chassis/Earth ground at the host end. Refer to Networking, page 26, for RS-422 cable grounding.

Earth Ground Wire

A ground wire must be provided to connect the Microterm to earth ground. This should be an 18 gauge stranded wire connected between the Microterm connector J6-1 and the nearest Earth ground source.

RS-232 Communication

The Microterm communicates with a host computer /PC, or a printer, via the RS-232 Communication channel. Use 3-conductor, stranded 22AWG cables with shielding and a drain wire.

Host Computer/PC or Printer

- 1. The cables have a maximum length of 50 feet between the Microterm and the host computer/printer.
- 2. Connect the drain wire to Chassis/Earth ground at the host computer/printer end.
- 3. Connect the host computer to the Microterm as detailed in Table 3. Refer to Figure 20 for connections between the host computer and the Microterm. The host computer is typically connected to the RS-232 cable using a DB9-S or DB-25-S connector.

Host Computer/PC Connections				
Signal	Host/PC DB9-S Pin	Host/PC DB25-S Pin	Microterm Connector/Pin	Microterm Pin Label
Ground	5	7	J5-3	GD
Host RXD	2	3	J5-2	T
Host TXD	3	2	J5-1	R

Table 3

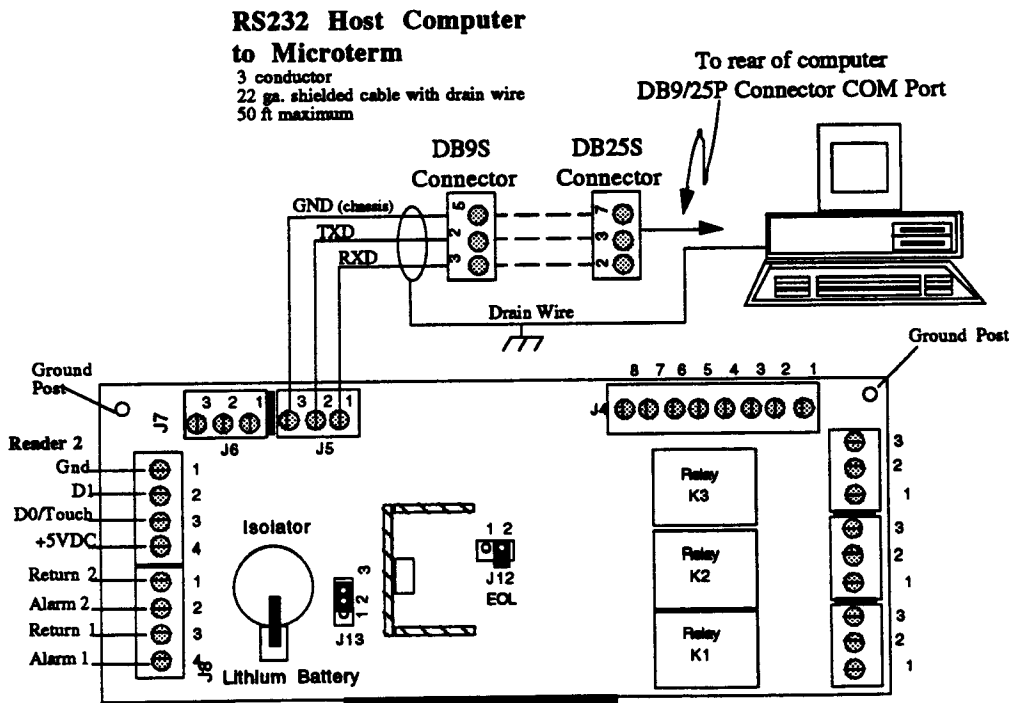


Figure 20 - Host Computer to Microterm

Printer Connections

1. Connect the printer to the Microterm as detailed in Table 4.

Refer to Figure 21 for connections between the printer and the Microterm. The printer is typically connected to the RS-232 cable using a DB25-P connector.

Note to Manage Host software users
To enable the Microterm to print transactions, set the Download Names selection of the Setup Utility menu in the Manage Host software to YES.

Refer to the Manage Operator's Manual.

Set the printer as follows:
Baud Rate = 9600
Parity = None
Data Bits = 8
Stop Bits = 1

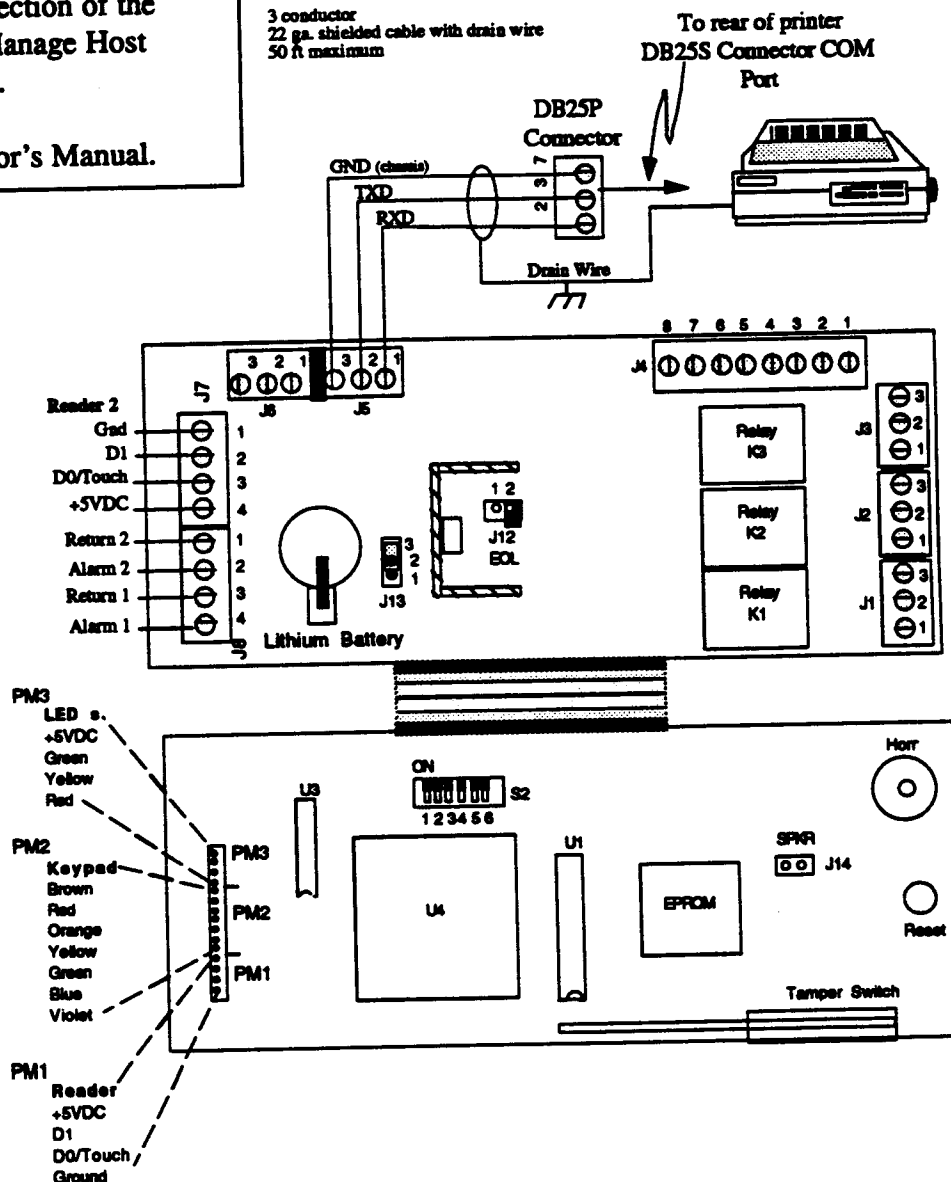
Printer to Microterm Connections

Signal	Printer DB25-P pin	Microterm Connector Pin	Microterm Pin Label
Ground	7	J5-3	GD
Print Rec	3	J5-2	T
Print Trans	2	J5-1	R

Table 4

RS232 Printer to Microterm

3 conductor
22 ga. shielded cable with drain wire
50 ft maximum



Networking

The Microterm can be networked with a maximum of 31 other Microterms or other Continental Instruments Access Control devices (Miniterm, Smarterm, and Superterm).

The following network configurations are available.

RS-232 to RS-422 Networks

RS-232 to RS-422 Repeat Networks

RS-232 to RS-422 Multidrop Network

RS-422 to RS-422 Networks

RS-422 to RS-422 Repeat Network

RS-422 to RS-422 Multidrop Network

Note

If the first Microterm in the network is *less* than 50 feet from the host computer, the first Microterm may be used to convert the RS-232 polling signal to RS-422 for the remainder of the network.

If the first Microterm in the network is *more* than 50 feet from the host computer, an RS-422 polling channel is required. Refer to RS-232 to RS-422 Conversion Networks, page 27.

To connect the Microterms together in a RS-422 network, use 4-conductor (two twisted pair), stranded 22 AWG cable, with shielding and a drain wire.

The cable is restricted to a maximum length of 4000 feet between each Microterm for Repeat Networks and a total length of 4000 feet for Multidrop Networks.

Address and Jumper Settings within a Network

Each Microterm in the network must have a unique polling address other than zero. Refer to Table 1, "Address DIP Switch S2", page 9.

Depending on the network configuration, the MODE (J13) and EOL (J12) jumpers on the Microterm boards will have to be set appropriately. The proper jumper settings are described in each of the following sections.

RS-232 to RS-422 Networks

If the first Microterm in the network is *less* than 50 feet from the host computer, then the first Microterm may be used to convert the RS-232 polling signal from the host to RS-422 for the remainder of the network.

Wire the first Microterm to the RS-232 port of the host computer. Wire the remainder of the network together using the Microterm's RS-422 ports. Use this procedure for either Repeat or Multidrop RS-232 to RS-422 networks.

To convert RS-232 to an RS-422 signal, the first Microterm in the network must be in Repeat mode and connected as follows.

Two RS-232 to RS-422 networks are described below:

- RS-232 to RS-422 Repeat Network
- RS-232 to RS-422 Multidrop Network

RS-232 to RS-422 Repeat Network

Jumper Settings:

MODE (J13): Insert the jumper between pins 2 and 3 (Repeat) for each Microterm in the network. Refer to Jumper Settings, page 6.

EOL (J12): Insert the jumper between pins 1 and 2 (Resistor In) for each Microterm in the network. Refer to Jumper Settings, page 6.

The drain wires for all RS-422 cables in the network must be connected together (isolated from the boards) and grounded at the first Microterm in the Network (closest to the host computer). The drain wire for the RS-232 cable should be grounded at the host end.

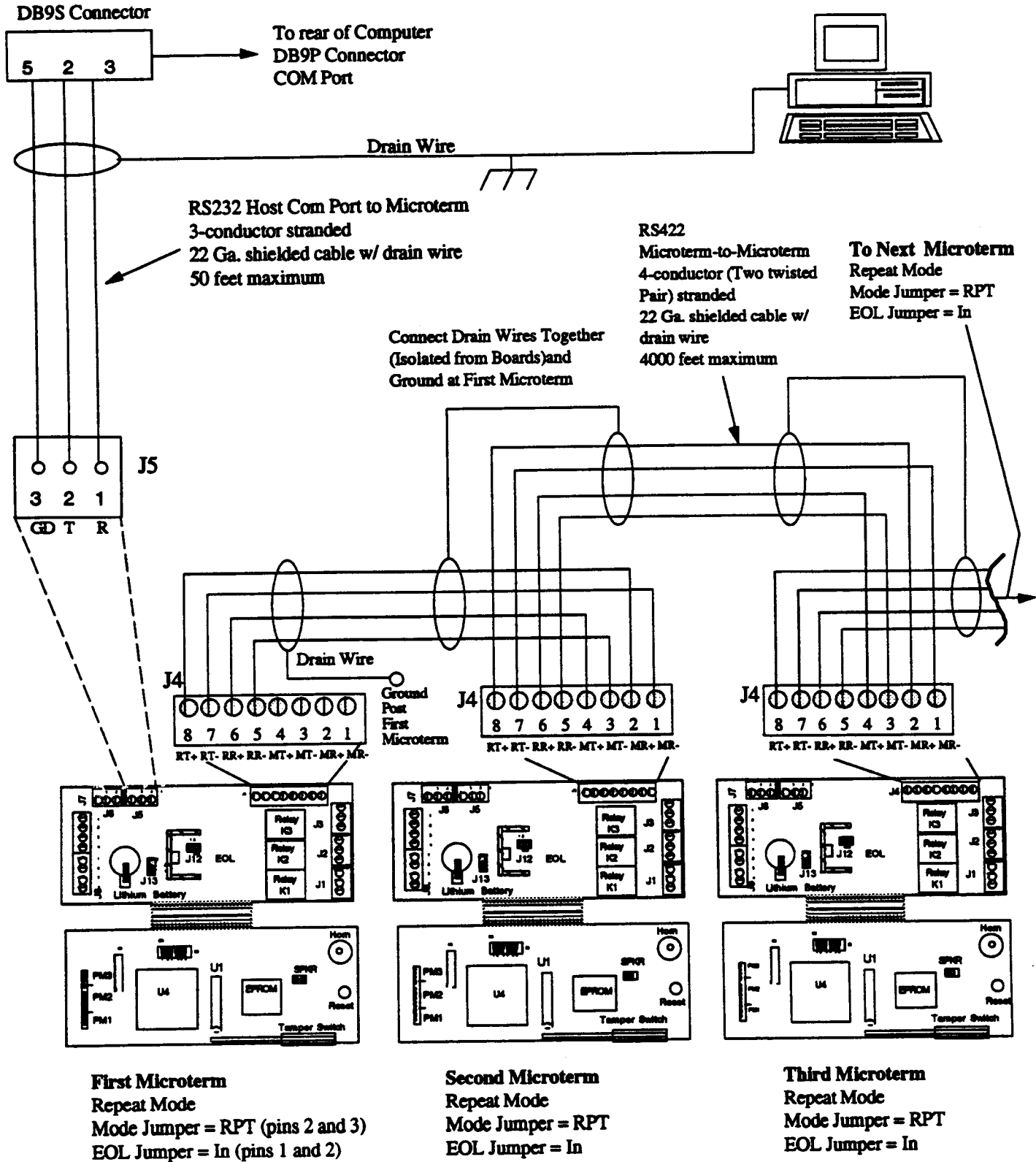
Connect the RS-232 to RS-422 Repeat Network cables as shown in Figure 22 and detailed in Table 5.

RS-232 to RS-422 Conversion Connections for a Microterm Repeat Network

Host Computer	Micro #1 (Repeat) (EOL=In)	Micro #2 (Repeat) (EOL=In)	Micro #3 (Repeat) (EOL=In)	Micro #4 (Repeat) (EOL=In)	To Next Micro
Signal	Connector/Pin	Connector/Pin	Connector/Pin	Connector/Pin	
RS-232 RXD	J5-2 (T)				
RS-232 TXD	J5-1 (R)				
RS-232 GND	J5-3 (GD)				
	J4-8 (RT+)	J4-2 (MR+)			
	J4-7 (RT-)	J4-1 (MR-)			
	J4-6 (RR+)	J4-4 (MT+)			
	J4-5 (RR-)	J4-3 (MT-)			
		J4-8 (RT+)	J4-2 (MR+)		
		J4-7 (RT-)	J4-1 (MR-)		
		J4-6 (RR+)	J4-4 (MT+)		
		J4-5 (RR-)	J4-3 (MT-)		
			J4-8 (RT+)	J4-2 (MR+)	>>>
			J4-7 (RT-)	J4-1 (MR-)	>>>
			J4-6 (RR+)	J4-4 (MT+)	>>>
			J4-5 (RR-)	J4-3 (MT-)	>>>

Table 5

Installation



Note: Different Address for each Microterm (Address 0 not valid)

Figure 22 RS-232 to RS-422 Repeat Network

RS-232 to RS-422 Multidrop Network

Jumper Settings:

MODE (J13): Insert the jumper between pins 2 and 3 (Repeat) for the first Microterm in the network. Insert the jumper between pins 1 and 2 (Multidrop) for all other Microterms in the network. Refer to Jumper Settings, page 6.

EOL (J12): Insert the jumper between pins 1 and 2 (Resistor In) for the first and last Microterms in the network. Refer to Jumper Settings, page 6.

RS-232 to RS-422 Conversion Connections for a Microterm Multidrop Network

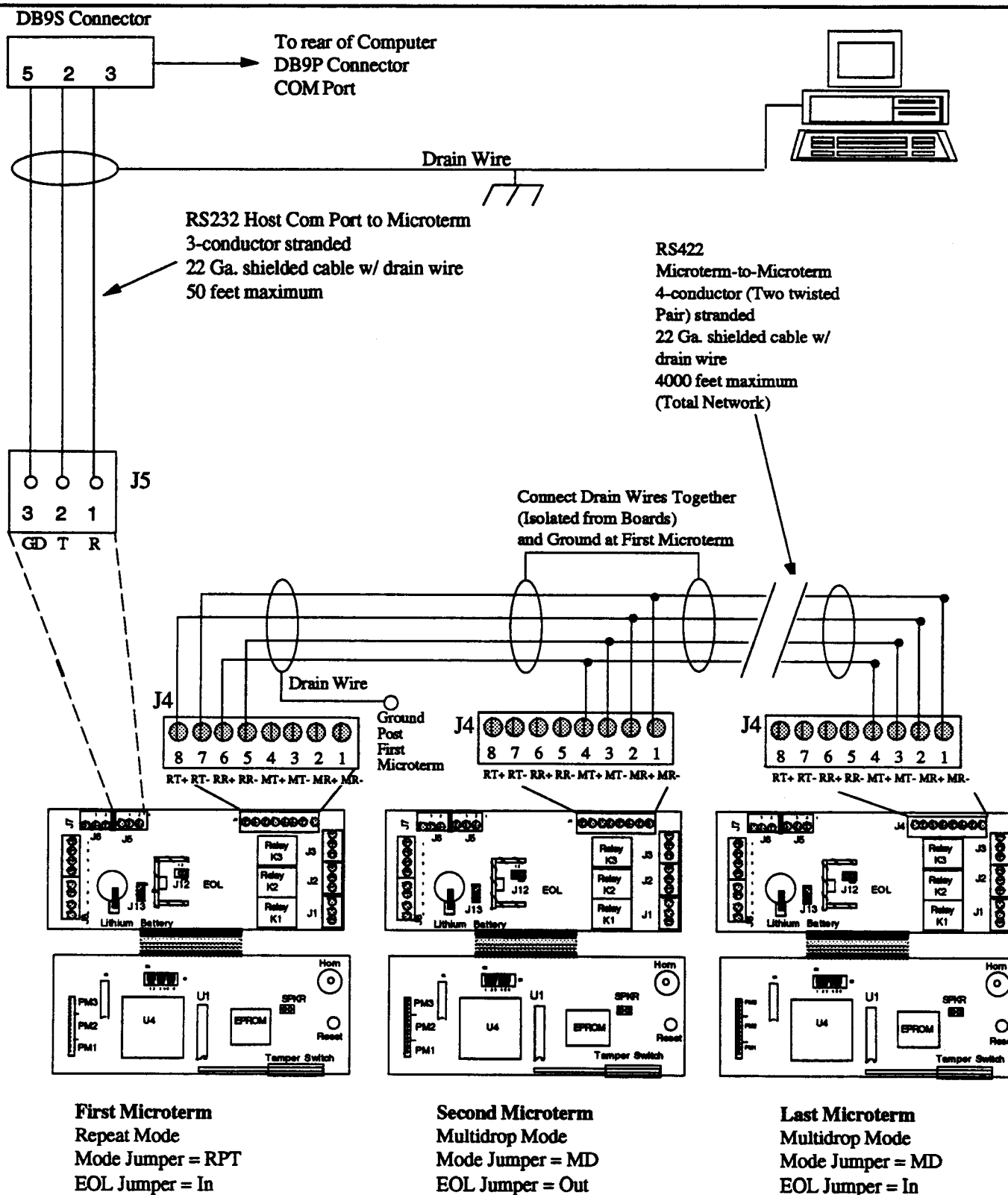
Host Computer	Micro #1 (Repeat) (EOL=In)	Micro #2 (Multidrop) (EOL=Out)	Micro #3 (Multidrop) (EOL=Out)	Last Microterm (Multidrop) (EOL=In)
Signal	Connector/Pin	Connector/Pin	Connector/Pin	Connector/Pin
RS-232 RXD	J5-2 (T)			
RS-232 TXD	J5-1 (R)			
RS-232 GND	J5-3 (GD)			
	J4-8 (RT+)	J4-2 (MR+)	J4-2 (MR+) >>>	J4-2 (MR+)
	J4-7 (RT-)	J4-1 (MR-)	J4-1 (MR-) >>>	J4-1 (MR-)
	J4-6 (RR+)	J4-4 (MT+)	J4-4 (MT+) >>>	J4-4 (MT+)
	J4-5 (RR-)	J4-3 (MT-)	J4-3 (MT-) >>>	J4-3 (MT-)

Table 6

The drain wires for all RS-422 cables in the network must be connected together (isolated from the boards) and grounded at the first Microterm in the Network (closest to the host computer). The drain wire for the RS-232 cable should be grounded at the host end.

Connect the RS-232 to RS-422 Multidrop Network cables as shown in Figure 23 and detailed in Table 6.

Installation



Note: Different Address for each Microterm (Address 0 not valid)

Figure 23 RS-232 to RS-422 Multidrop Network

RS-422 to RS-422 Networks

If the first Microterm in the network is *more* than 50 feet from the host computer, then the polling line from the host **MUST** be RS-422.

A Continental Instruments RS-422 Polling Line Converter (part number CICE1940PL) may be used at the host computer to convert RS-232 to RS-422.

The drain wires for all cables in the network must be connected together (isolated from the boards) and grounded at the host computer.

Two RS-422 to RS-422 networks are described below:

- RS-422 to RS-422 Repeat Network
- RS-422 to RS-422 Multidrop Network

RS-422 to RS-422 Repeat Network**Jumper Settings:**

MODE (J13) - Insert the jumper between pins 2 and 3 (Repeat) for each Microterm in the network. Refer to Jumper Settings, page 6.

EOL (J12) - Insert the jumper between pins 1 and 2 (Resistor In) for each Microterm in the network. Refer to Jumper Settings, page 6.

Connect the RS-422 to RS-422 Repeat Network cables as shown in Figure 24 and detailed in Table 7.

RS-422 to RS-422 Connections for a Microterm Repeat Network

Host Computer	Micro #1 (Repeat) (EOL=In)	Micro #2 (Repeat) (EOL=In)	Micro #3 (Repeat) (EOL=In)	Micro #4 (Repeat) (EOL=In)	To Next Micro
Signal	Connector/Pin	Connector/Pin	Connector/Pin	Connector/Pin	
RS-422 TXD+	J4-2 (MR+)				
RS-422 TXD-	J4-1 (MR-)				
RS-422 RXD+	J4-4 (MT+)				
RS-422 RXD-	J4-3 (MT-)				
	J4-8 (RT+)	J4-2 (MR+)			
	J4-7 (RT-)	J4-1 (MR-)			
	J4-6 (RR+)	J4-4 (MT+)			
	J4-5 (RR-)	J4-3 (MT-)			
		J4-8 (RT+)	J4-2 (MR+)		
		J4-7 (RT-)	J4-1 (MR-)		
		J4-6 (RR+)	J4-4 (MT+)		
		J4-5 (RR-)	J4-3 (MT-)		
			J4-8 (RT+)	J4-2 (MR+)	>>>
			J4-7 (RT-)	J4-1 (MR-)	>>>
			J4-6 (RR+)	J4-4 (MT+)	>>>
			J4-5 (RR-)	J4-3 (MT-)	>>>

Table 7

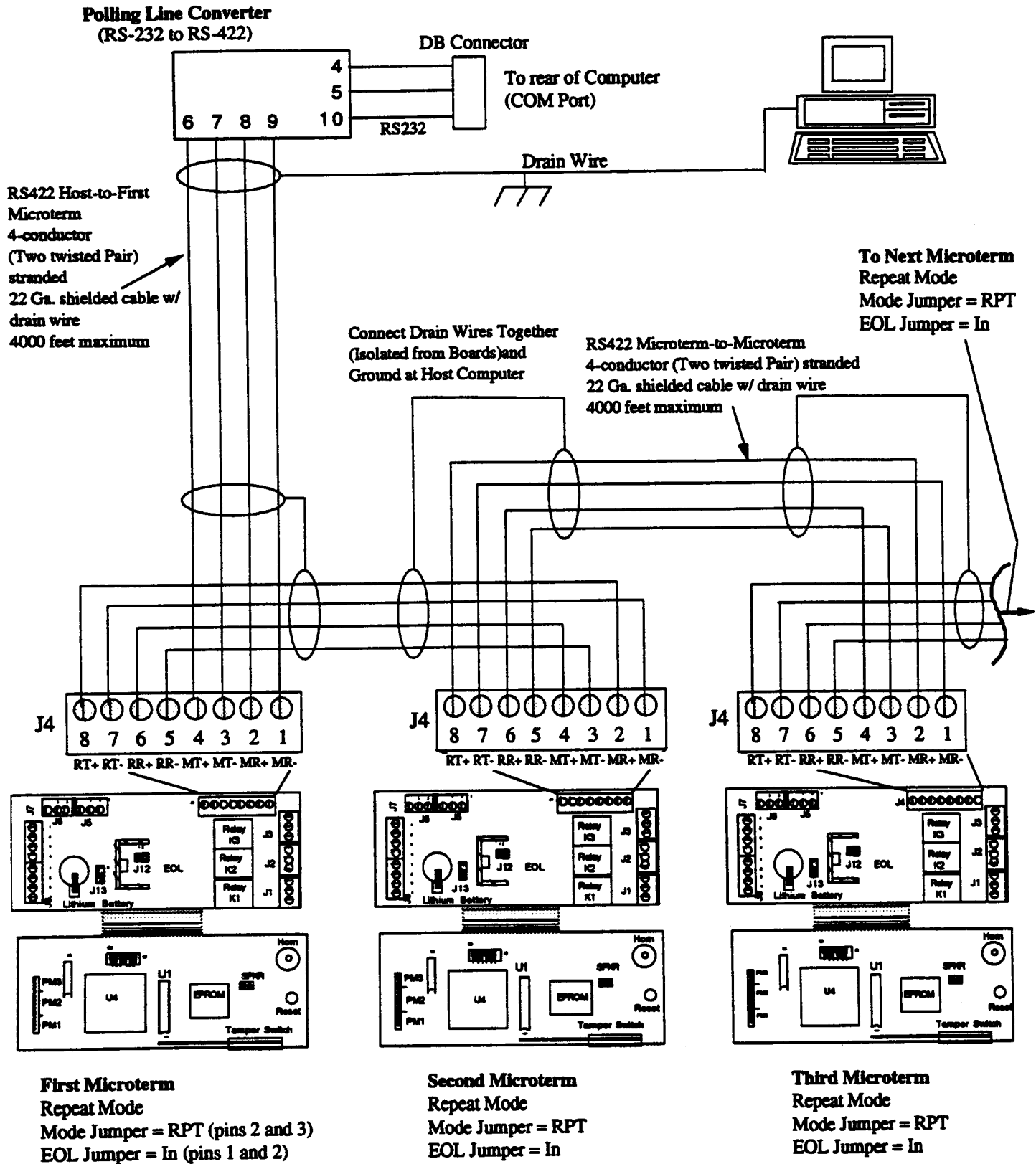


Figure 24 RS-422 to RS-422 Repeat Network

RS-422 to RS-422 Multidrop Network

Jumper Settings:

Mode (J13) - Insert the jumper between pins 1 and 2 (Multidrop) for each Microterm in the network. Refer to Jumper Settings, page 6.

EOL (J12) - Insert the jumper between pins 1 and 2 (Resistor In) for the LAST Microterm in the network only. Refer to Jumper Settings, page 6.

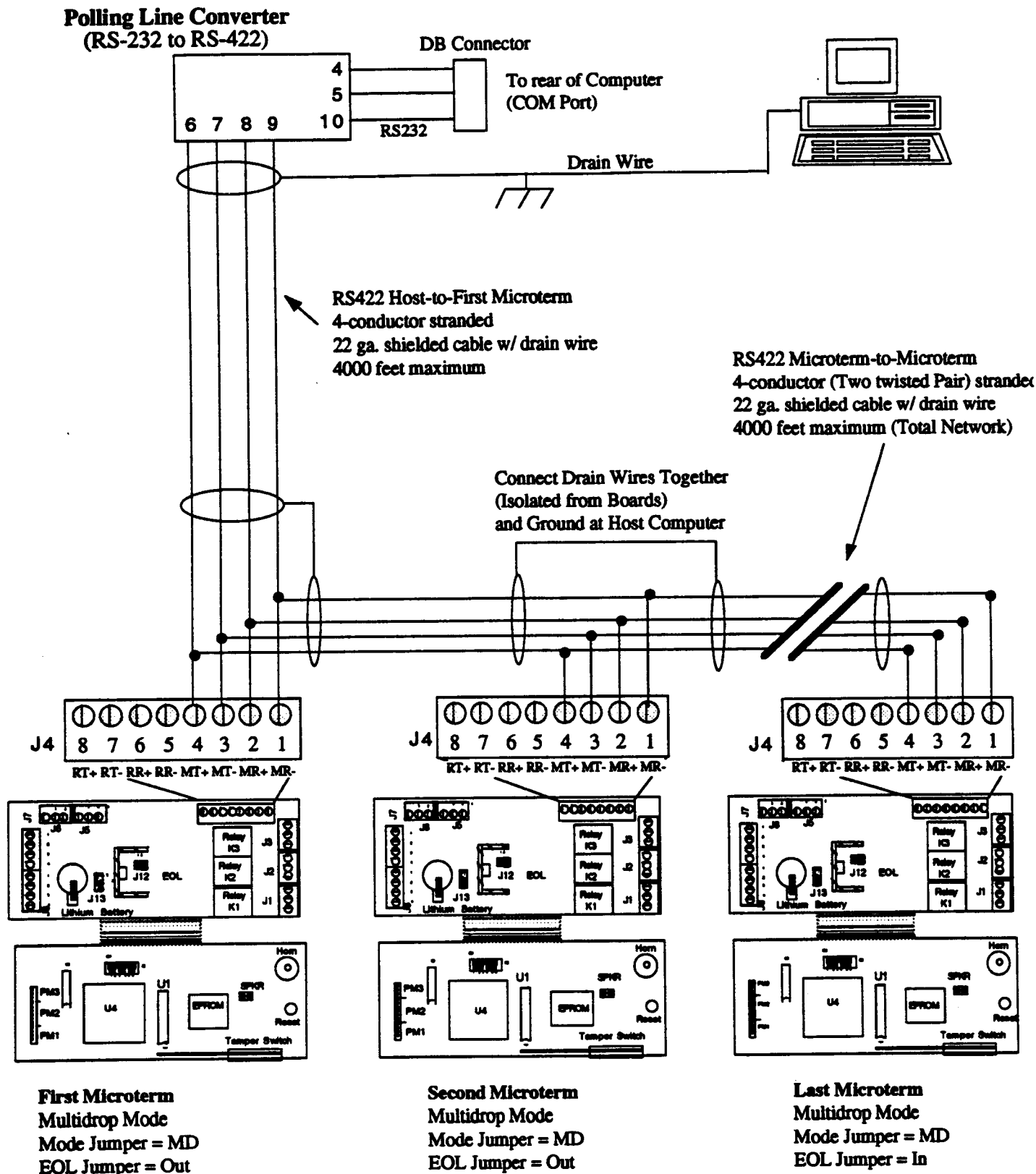
RS-422 to RS-422 Connections for a Microterm Multidrop Network

Host Computer	Micro #1 (Multidrop) (EOL=Out)	Micro #2 (Multidrop) (EOL=Out)	Micro #3 (Multidrop) (EOL=Out)		Last Microterm (Multidrop) (EOL=In)
Signal	Connector/Pin	Connector/Pin	Connector/Pin		Connector/Pin
RS-422 TXD+	J4-2 (MR+)	J4-2 (MR+)	J4-2 (MR+)	>>>	J4-2 (MR+)
RS-422 TXD-	J4-1 (MR-)	J4-1 (MR-)	J4-1 (MR-)	>>>	J4-1 (MR-)
RS-422 RXD+	J4-4 (MT+)	J4-4 (MT+)	J4-4 (MT+)	>>>	J4-4 (MT+)
RS-422 RXD-	J4-3 (MT-)	J4-3 (MT-)	J4-3 (MT-)	>>>	J4-3 (MT-)

Table 8

The drain wires for all cables in the network must be connected together (isolated from the boards) and grounded at the host computer.

Connect the Multidrop Network cables and Drain wires as shown in Figure 25 and detailed in Table 8.



Note: Different Address for each Microterm (Address 0 not valid)

Figure 25 RS-422 to RS-422 Multidrop Network

Modem Operation

The Microterm can communicate to the host computer through a modem. To connect the Microterm to a modem, configure the Microterm as follows.

Modem Switch

Set DIP Switch S2 position 6 (MD) on the Microterm to the OFF position for all Microterms connected to the modem.

Every Microterm in a network that is connected to a modem **MUST** have position 6 on S2 set to OFF.

The Microterm communicates to the modem via the RS-232 channel.

The Microterm operates at 2400 baud rate when communicating with a modem.

Use 3-conductor, stranded 22 AWG cable with shielding and a drain wire.

Connect the drain wire to ground at the modem end.

Modem Connections			
Signal	Modem DB25	Microterm Connector/Pin	Microterm Pin Label
Ground	7	J5-3	GD
Modem TXD	2	J5-2	T
Modem RXD	3	J5-1	R

Table 9

Refer to Figure 26 and Table 9 for modem connections.

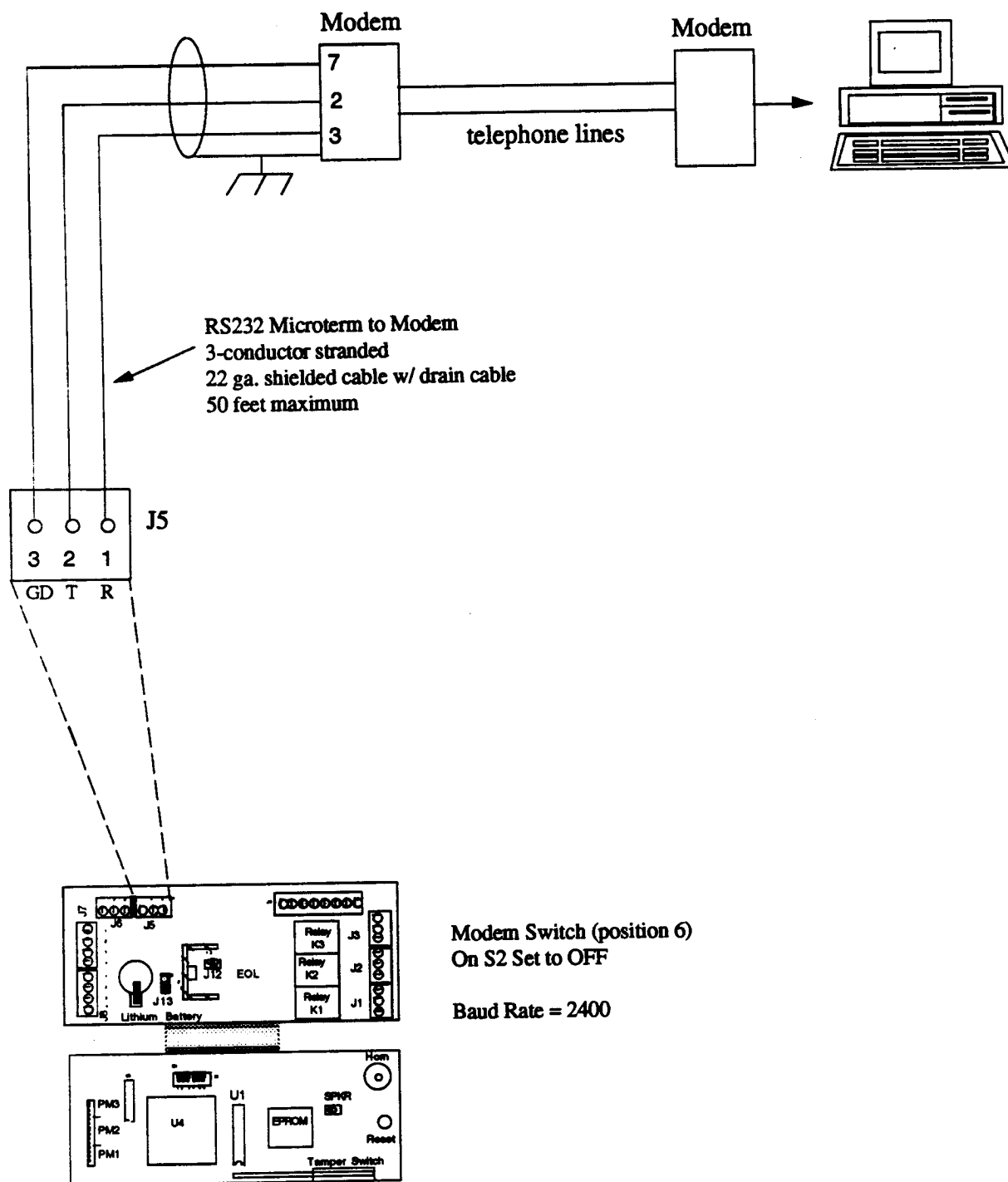


Figure 26 - Host to Microterm with Modem

Relay Outputs

The Microterm contains three relay outputs which can be used to control door strikes, door alarm shunts, external alarms, etc...

All the relays have the following characteristics.

- Form "C" relay with a contact rating of 3A @ 28VDC (3A @ 120VAC, resistive).
- The NO (normally open), COM (common), and NC (normally closed) contacts are the default state of non-energized relays.
- To reduce electrical noise* (caused by the door strike coil) returning to the system, metal oxide varistors (MOVs) have been placed across all the relay contacts. These MOVs limit any noise caused by the strike coil to 56 volts. In addition, it is recommended that a 56 volt MOV be installed at the strike coil. Additional MOVs are available (part number 480-1048 (RV0005)).

* Because of this noise, door strike wiring **MUST NOT** be laid in the same conduit with other wiring.

- To use door strikes with a coil voltage greater than 56 volts, an external relay **must** be used, which can be driven by a Microterm relay.

The relays are user-programmable, however, typical use for the relays are:

Relay 1 = Door Strike
Relay 2 = Door Alarm Shunt
Relay 3 = Console Relay

Refer to Figure 1 for relay connections to the Microterm. Relay wire gauge and length are not specified here. They are user-defined based on the application.

Use the appropriate wires to make the connections to the Microterm as described in Table 10.

Relay-to-Microterm Connections

Signal	Microterm Connector/Pin	Microterm Pin Label	Typical Use
Relay 1 NO	J1-1	NO	Door Strike
Relay 1 COM	J1-2	C	Door Strike
Relay 1 NC	J1-3	NC	Door Strike
Relay 2 NO	J2-1	NO	Door Alarm Shunt
Relay 2 COM	J2-2	C	Door Alarm Shunt
Relay 2 NC	J2-3	NC	Door Alarm Shunt
Relay 3 NO	J3-1	NO	Console Relay
Relay 3 COM	J3-2	C	Console Relay
Relay 3 NC	J3-3	NC	Console Relay

Table 10

Door Strike Power

If the Microterm 12VDC Power Supply is used to provide door strike power, connect the 12VDC input (J6-3) to the strike relay normally open (NO) contact (Relay 1; J1-1) using an 18 AWG wire. Use the COM contact to drive the door strike. Connect the Strike Return to the Microterm Ground (J6-2). Refer to Figure 27. **Note:** The 12VDC Door Strike **MUST** draw less than 0.9 amps.

Tamper Switch Adjustment

The Microterm comes equipped with a tamper switch. The tamper switch is activated when the long lever on the switch receives enough pressure from the enclosure faceplate. If the faceplate does not depress the lever far enough the switch will not activate.

Adjust the tamper switch by carefully bending the lever outward from the unit. This provides greater pressure from the faceplate. If necessary, bend the lever at the end away from the switch.

Before attaching the faceplate, test the tamper switch by holding the faceplate in place and listening to hear the switch activate. A "click" will be heard when it activates. Adjust the switch as required.

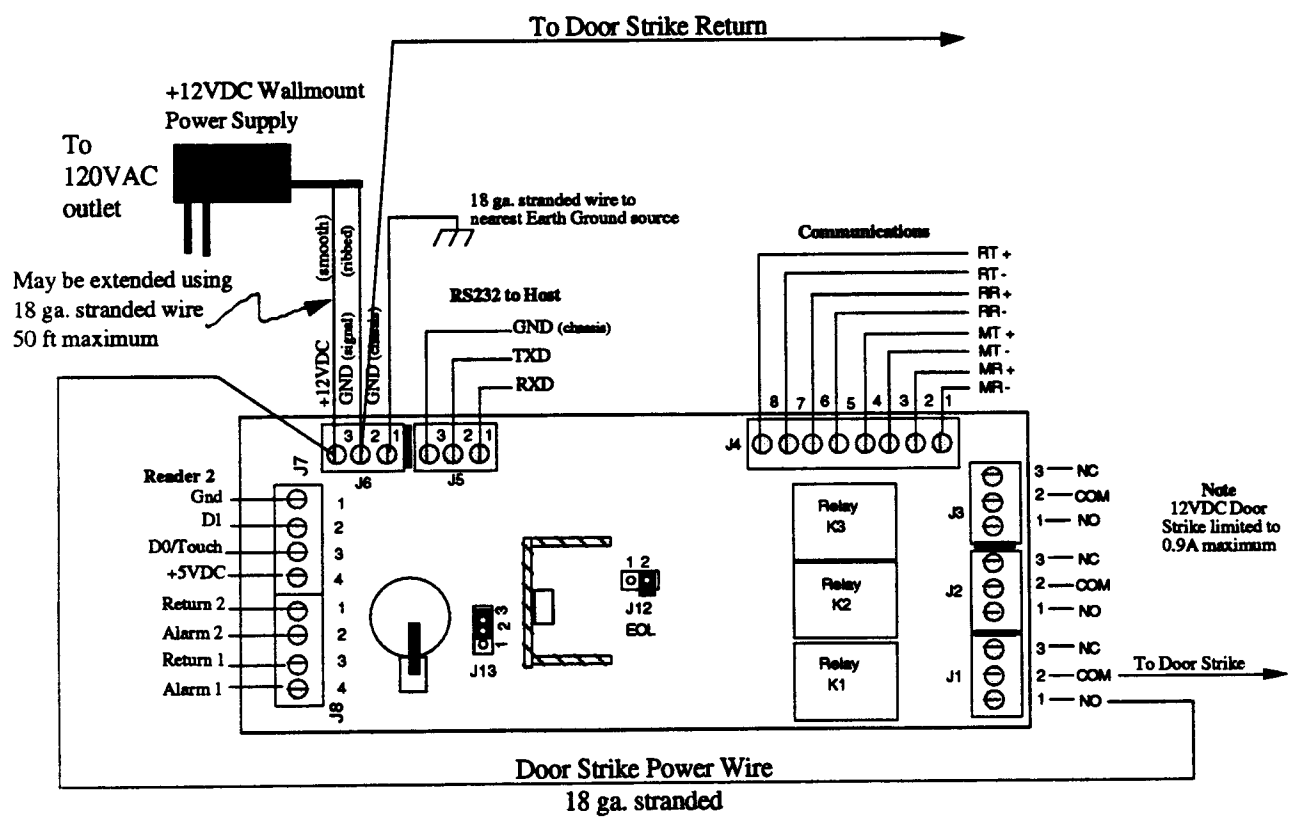


Figure 27 - Microterm Power Supply Door Strike Wire

Faceplate Installation

Confirm that:

1. The settings of the jumpers and the S2 DIP Switch on the Microterm are correct
2. The battery has been activated.
3. All cables and wires have been connected to the Microterm and properly grounded.
4. Install the enclosure faceplate using the screws provided.

Post Installation Check

Apply power to the unit after the Microterm is installed and mounted.

Immediately, after power-up, the Microterm performs a test which controls the LED control lines and the buzzer. If the buzzer is installed, a sequence of three buzzer sounds (approximately one second each, and one second apart) should be heard. If reader LEDs are installed they should activate on the third buzzer sound.

Field Replaceable Parts

The following table describes all Microterm field replaceable parts.

Item	Part #
Microterm Circuit Board	AC297 1
Lithium Battery	HE0044
	Lithium
	Battery
	3.6V
EPROM	

Factory Repair Procedure

If the Microterm requires factory repair, follow this procedure.

1. Provide a purchase order number. (This is required before any repairs can begin.)
2. Include a note with the following information
 - Serial number of Microterm
 - a detailed description of the problem(s) with the unit
 - state method of return shipment (UPS, Federal Express, etc.)

Use the form on the following page. DO NOT omit any information.

3. Send to:
Continental Instruments LLC
Attn: Repair Dept.
355 Bayview Avenue
Amityville, NY 11701
631-842-9400

Factory Repair Form

Return Authorization # _____

Company Name: _____

Company Address: _____

Your Name: _____

Telephone Number: _____

Microterm Serial No. _____

Method of Return Shipment: _____
(UPS, Federal Express, Acct #) _____

Detailed Description of Problem: _____

Troubleshooting Checklist

_____ Visual Inspection of both Microterm boards, one bracket, and one power supply

_____ Battery Activation; remove paper isolator

Jumper Settings

_____ J12 - Do not install jumper for a stand-alone Microterm

_____ J13 - Insert jumper between pins 2 and 3 for a stand-alone Microterm

_____ J14 - Insert jumper for activation of an on-board buzzer

Address Switch Settings

_____ DIP Switch 2 - Refer to Table 1, page 9

_____ Cable & Wire Routing	Refer to page 6
_____ Alarm Inputs	Refer to page 15
_____ Supervised Alarms	Refer to page 16
_____ Non-Supervised Alarms	Refer to page 17
_____ Reader 2 (Optional)	Refer to page 18
_____ Power	Refer to page 22
_____ Grounding	Refer to page 23
_____ RS-232 Communication	Refer to page 24
_____ Printer Connections	Refer to page 25
_____ Networking	Refer to page 26
_____ Modem Operation	Refer to page 35
_____ Relay Outputs	Refer to page 37

Cables & Wires

Cables

	AWG.	Type	Max. Length	Signal Levels
Alarm Inputs	22 ga.	stranded shielded w/ drain 2-conductor/alarm	1000 ft.	0 to 5VDC 3.4mA max.
Readers Mag Stripe & Wiegand/Proximity	22 ga.	stranded shielded w/ drain 4 or 5-conductor (5-conductor for readers w/ LEDs)	800 ft	5V Logic 50mA max per reader (100mA total)
Dallas Touch	22 ga.	stranded shielded w/ drain 2-conductor	300 ft	5V Logic
Keypad	22 ga.	stranded shielded w/ drain 7-conductor	50 ft	5V Logic
Polling Line RS422 (Network)	22 ga.	stranded shielded w/ drain 2-twisted pair*	4000 ft	RS-422 5V Logic
RS-232, Dial-Up (Host Computer)	22 ga. 3-conductor	stranded shielded w/ drain	50 ft	RS-232 +/-12V
Printer	22 ga.	stranded shielded w/ drain 3 conductor	50 ft	RS-232 +/-12V

Wires

Power Supply	18 ga.	stranded 2-conductor	50 ft	12VDC
Door Strike	18 ga.	stranded	as required	12VDC 1A maximum
Earth Ground	18 ga.	stranded	as required	

* Note: RS-422 cables MUST be twisted pair. All other cables MUST not be twisted pair.

Specifications	Quantity	Comments
Readers	2	Full function on or off line
Anti-Passback		Standard
Access Modes	4	Card Only, Unique Code Only, Card and Code, Free Access
Serial Ports	1	Host Computer or Printer (RS-232)
Polling Modes	3	Dial-Up (RS-232), RS-422 Multidrop, RS-422 Repeat
Baud Rates	4	1200, 2400, 4800, 9600
Keypads	1	4 x 3
Relays	3	Form "C", contact rating of 3A @ 28VDC
Alarms	2	Supervised or Non-Supervised
LEDs	3	Red, Yellow, Green
Tamper Switch	1	Pre-assigned
Reader Types		Wiegand/Proximity, Magnetic Stripe, Dallas Touch
Battery Backup Memory		6 months nominal at 25°C
Weight		7.5 oz.
Enclosure Dimensions		7.5" x 7.5"
Temperature Range		
Operating		32 - 115°F (0-46°C)
Storage		32 - 149°F (0-65°C)
Relative Humidity		0% to 80% (non-condensing)



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