

*Badger OmniRemote*TM

Shelf Installation Manual

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Manual Overview

1

Chapter Summary

In this Chapter The following topics are covered in this chapter:

Topic	See Page
About this Manual	1-2
Using this Manual	1-3
Technical Support	1-5

About this Manual

Purpose This manual covers installation of the OmniRemote™ Shelf. It is organized into task-based topics, each with a step-by-step description of how to perform the task.

Topics Covered The topics covered in this manual are as follows:

Topic	Page
Manual Overview	
About this Manual	1-2
Using this Manual	1-3
Technical Support	1-5
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User Safety	2-2
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Using this Manual

Who Should Use this Manual This manual is designed for the technician installing the OmniRemote Shelf. Knowledge of electrical and mechanical connectivity is required.

User Attention Words Five user attention words appear throughout this manual. Each word implies a particular level of observation or action as follows:

Note This word is used to call attention to information.

IMPORTANT This word calls attention to information that is necessary for correct use of the kit or instrument.

CAUTION This word informs the user that damage to the instrument could occur if the user does not comply with the information. It also indicates a potentially hazardous situation that could result in minor or moderate injury to the user.

! WARNING ! This word informs the user that serious physical injury or illness to the user or other persons could occur if these required precautions are not taken.

Typographical Conventions The following typographical conventions are used in this manual:

- ◆ **Bold:** indicates literal values that you type or select. For example, press **Enter** indicates that you should press the enter/return key.
- ◆ ***Bold italic:*** indicates a variable value that you supply. For example, *file name* indicates that you enter a file name of your choice.
- ◆ `Courier font:` indicates the computer response.

CDROM The OmniRemote manuals are provided as Adobe Acrobat® pxx dxx files (pdfs) on the CDROM included with your OmniRemote purchase. You may print as many manuals as you require for your use. Copyright regulations are in effect for distribution or resale to other companies not directly involved with the installation of your OmniRemote.

Note The Adobe Acrobat Reader program can be used with most computer operating systems. The program can be downloaded from the Internet through the Adobe Systems Incorporated web site: www.adobe.com.

If You Need More Information

If you need information on...	See the...	Part Number
Installing the Bistate Analog Module (BAM),	<i>BAM Installation Manual</i>	Badger: D47-20233-xx
Installing the Serial Alarm Module (SAM),	<i>SAM Installation Manual</i>	Badger: D47-20228-xx
Installing the Router Access Module-Dual Port (RAM-DP),		
Installing the Router Access Module-Single Port (RAM-SP),		
Running the OmniRemote software,	<i>DAD Provisioner's Manual</i>	Badger: D47-20544-xx
	<i>DAD/BAM Application Notes</i>	Badger: AP01-20933-xx
	<i>Other DAD Application Notes</i>	See your Sales Representative.
The OmniRemote product overview and specifications,	<i>OmniRemote 2020 Brochure</i>	See your Sales Representative.

Technical Support

How to Reach Us If you have questions or encounter problems while installing the OmniRemote, you can reach us as follows:

Telephone	1-408-957-8600
Facsimile	1-408-957-8601
Mailing address	Badger Technology, Inc. 1423 South Milpitas Boulevard Milpitas, CA 95035-6828
World Wide Web:	http://www.badger.com Note We encourage you to visit our web site for answers to frequently asked questions (FAQs) and to learn more about our products.

Hours for Telephone Technical Support Telephone technical support is available at the following times.

Days	Hours
Monday through Friday	8:00 a.m. to 5:00 p.m., Pacific Time

Manual Corrections If you have comments, corrections, or suggestions regarding this manual, you can reach us as follows:

E-mail	techpubs@badger.com
Facsimile	1-408-957-8601 Attn: Badger Technology Manual Publications
Mailing address	Badger Technology Manual Publications 1423 South Milpitas Boulevard Milpitas, CA 95035-6828

Safety Information

2

Chapter Summary

IMPORTANT Read this chapter before you install or connect the OmniRemote™ Shelf.

In this Chapter The following topics are covered in this chapter:

Topic	See Page
User Safety	2-2
Instrument Care	2-3

User Safety

Overview To ensure your safety, follow the guidelines given below whenever you operate the OmniRemote.

Installation **CAUTION** The OmniRemote should be installed according to the instructions provided in this manual; otherwise, safety features may be impaired.

Grounding and Electrical Safety **! WARNING !** The OmniRemote must be grounded for protection against electrical shock. When handling any of the OmniRemote cards, you must observe the following safety precautions:

- ◆ Wear a grounding wrist strap.
 - ◆ Do not touch a module without first grounding yourself.
 - ◆ Handle all modules by their edges.
 - ◆ Do not touch any module components.
-

Temperature **CAUTION** The OmniRemote will operate safely when the ambient temperature is 0 to +55 °C (–4 to +131 °F).

Environment **CAUTION** In the event that the OmniRemote has been subjected to adverse environmental conditions (such as fire, flood, earthquake, etc.), a service inspection of the OmniRemote should be made to ensure safe operation.

Instrument Care

Overview	To maintain your OmniRemote in good working order, follow the guidelines given below.
Chassis Ground	Chassis ground is provided if your OmniRemote is securely fastened to a grounded mounting rack. Use of the chassis ground terminal on the male power terminal block is also recommended.
Environment, Humidity, and Temperature	<p>The OmniRemote is designed for indoor and outdoor use.</p> <p>The OmniRemote will meet performance specifications when the ambient temperature is 0 to +55 °C (–4 to +131 °F) and the ambient relative humidity is 0 to 95%, non-condensing. These specifications have been calculated at sea level.</p>
FCC Compliance (U.S.)	The OmniRemote is classified as a digital device used exclusively as industrial, commercial, or medical test equipment. It is exempt from the technical standards specified in Part 15 of the FCC Rules and Regulations, based on Section 15.103(c).
Over-Current Protection	Over-current protection is provided by a fused thermistor. Time-to-trip varies based on ambient temperature and applied over-current. At 24 Vdc, the minimum trip current is 5 A after 15 seconds. Damage to the fuse occurs at 4 A at 60 Vdc. You must wait for the thermistor to cool down after a trip. This allows the thermistor to reset and operate at the prescribed power rating.
Storage	The OmniRemote must be stored at a temperature between –20 °C and 60 °C (–4 °F and 140 °F).
Voltage Range	Applied power must be +18 to +72 Vdc (negative ground) and –18 to –72 Vdc (positive ground). The OmniRemote operates with a 15 W or 20 W power supply.

3

Instrument Overview

Chapter Summary

In this Chapter The following topics are covered in this chapter:

Topic	See Page
About the OmniRemote	3-2
Hardware Component Overview	3-4
Ordering Hardware Components and Accessories	3-7

About the OmniRemote

OmniRemote Overview The OmniRemote™ instrument is a universal, remote-site gateway. It performs:

- ◆ Environmental monitoring
- ◆ Multi-vendor telecommunications equipment monitoring
- ◆ Alarm management
- ◆ Protocol mediation
- ◆ Local Area Network (LAN) to Wide Area Network (WAN) remote access routing

The OmniRemote SAM provides a single communications path to all of your remote site network elements and environmental equipment. It eliminates multiple costly communications channels to each remote site by sharing bandwidth on a single channel. This channel can be modified to meet your needs, from a simple, low-cost, 9600-baud dial-up phone line to a dedicated 10BaseT Ethernet integrated to your WAN and corporate Intranet.

Network traffic can be significantly reduced by configuring SAM active message filters to eliminate redundant or status-only messages (such as those normally produced by TL1 devices). Protocol translation between different network elements and the Network Management System (NMS) has been caused by the rapid introduction of new technologies and legacy devices. The SAM provides these mediation services to offload processing from the NMS and reduce programming costs. Unlike traditional terminal services, communications bandwidth is conserved and central NMS processing reduced, thus providing the most scalable solution.

Hardware Components The OmniRemote has several hardware components:

- ◆ OmniRemote Shelf with Data Ports
- ◆ OmniRemote Shelf with 10BaseT Hub
- ◆ Bistate Analog Module (BAM)
- ◆ Serial Alarm Module (SAM)
- ◆ Router Access Module, Dual Port (RAM-DP)
- ◆ Router Access Module, Single Port (RAM-SP)

These hardware components can be combined in various configurations to suit your needs.

Note For a brief description of each of these components, see "Hardware Component Overview" on page 3-4.

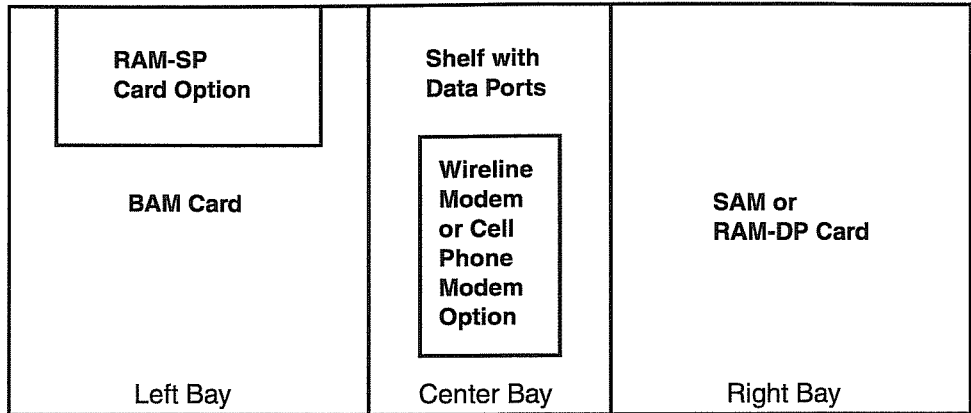
Chassis Configuration

The OmniRemote chassis requires only 1 RU height (1.75 inches) in a 19-inch mounting rack.

The chassis has left and right bays to hold the BAM, SAM, RAM-DP, or RAM-SP. A 3.5-inch center bay holds the power supply and other shared communication functions. The center bay card determines the OmniRemote Shelf configuration, which is one of the following:

- ◆ OmniRemote Shelf with Data Ports
- ◆ OmniRemote Shelf with 10BaseT Hub

The diagram below shows an example of a fully featured chassis configuration.



Software

The BAM, SAM, RAM-DP, and RAM-SP cards each support a microprocessor. The BAM and SAM cards can be downloaded via software.

The SAM uses Badger's Data Acquisition Device (DAD) software to collect serial and IP Ethernet alarm reports from the BAM and other network elements. The DAD software can operate on other platforms (*e.g.*, PC, Sun Workstation) or reside on a SAM installed in the OmniRemote. This allows you to filter and process alarm messages centrally, regionally, or from a remote site.

The DAD software can be extended for custom applications using a scripting language. With this scripting language, Badger can create new network element interfaces for your serial ports, identify their processing components, and route output to the specified destination port (*e.g.*, Network Operations Center [NOC]).

The BAM software collects voltage contact closures and values that result in serial alarm outputs.

The BAM and SAM are easily configured and downloaded using the DAD Control application. This JAVA-based application operates on any network PC running the Microsoft® Windows application (WIN95 or later versions).

Hardware Component Overview

Shelf with Data Ports The OmniRemote Shelf with Data Ports uses a Master Communications Interface (MCI) card in the center bay to provide power to the other modules in the chassis.

The MCI card supports the following communication options:

- ◆ Two bridged, asynchronous (RS-232 or RS-422) ports
- ◆ One synchronous (RS-422) V.35 port (e.g., T1 channel bank DSU/CSU) for a high-speed digital carrier
- ◆ Wireline phone modem
- ◆ Cell phone modem

This shelf can be configured with any combination of BAM, SAM, or RAM-SP in the chassis bays. When configured with a SAM, it also supports an Ethernet interface to the NOC.

Shelf with 10BaseT Hub The OmniRemote Shelf with 10BaseT Hub uses a built-in Ethernet 10BaseT Hub card in the center bay to provide power to the other modules in the chassis and to support a remote-site LAN. Six twisted-pair connections to your site equipment or PCs eliminate a separate hub.

This shelf can be configured with any combination of BAM, SAM, RAM-DP, or RAM-SP in the chassis bays.

BAM-64 The Bistate Analog Module (BAM) addresses a wide range of both public and private network supervisory applications. It is a flexible, field-expandable system that meets a variety of needs in many fields, such as telcos, pipeline, transportation, private networks, and water and electric utilities.

The BAM-64 supports 64 bistate inputs, 12 analog inputs, and 4 control outputs. The BAM-64 monitors discrete alarm conditions (contact closures, TTL, and voltage measurements) and provides remote control (relay contacts). Alarms are time-tagged, transient changes are filtered, and analog inputs have applied upper and lower thresholds.

Typical BAM-64 alarm reports include:

- ◆ Battery and station power
 - ◆ Security sensor
 - ◆ Various environmental measurements (e.g., temperature, humidity)
 - ◆ Communications equipment
-

SAM-10 The Serial Alarm Module (SAM-10) supports 10 serial ports and an Ethernet port for monitoring network elements. The SAM-10 monitors serial alarms and provides remote control (terminal cut-through to equipment) and protocol mediation.

Using the DAD software, the SAM-10 can be configured to receive autonomous messages or to actively poll network elements to determine their status. Received messages are parsed, filtered, translated, and buffered for immediate or later transmission. Log components may be configured between processing flow components to trace the message path.

Primary communications to the NMS can use the router WAN interface or dedicated or dial-up serial links on the MCI card. A point-to-point (PPP) protocol is recommended for serial communications over a WAN or a dial-up phone line to ensure integrity and transparency of the data.

Typical SAM-10 alarm reports include:

- ◆ TL1-based network elements
- ◆ Private Branch Exchanges (PBXs)
- ◆ Switches and cross-connects
- ◆ Intelligent remote communications equipment
- ◆ Badger BAMs

RAM-DP The Router Access Module-Dual Port (RAM-DP) is a flexible Ethernet bridge/router that may be configured to provide one LAN port and 1–2 WAN ports.

The RAM-DP supports the following:

- ◆ Leased lines on one to two physical WAN ports, interfacing to a high-speed digital carrier (*e.g.*, DSU/CSU)
 - ◆ ISDN for 1–2 Basic Rate Interface (BRI) B channels
 - ◆ Frame relay for 1–40 Permanent Virtual Circuits (PVC) across 1–2 physical WAN ports
 - ◆ WAN interfaces: ISDN/U, RS-422, V.24, V.35, X.21
 - ◆ One 10BaseT LAN interface
-

RAM-SP The Router Access Module-Single Port (RAM-SP) is especially suited for geographically dispersed sites. It is a flexible Ethernet bridge/router that can be configured to provide one LAN port and one WAN port.

The RAM-SP supports the following:

- ◆ A leased line on one physical WAN port, interfacing to a high-speed digital carrier (*e.g.*, DSU/CSU)
- ◆ ISDN for one BRI B channel
- ◆ Frame relay for 1–20 PVC across one physical WAN port
- ◆ Two WAN interfaces: V.35 (DB25), ISDN/U (RJ45)
- ◆ One LAN interface: Ethernet 10BaseT (supports six IP addresses)

Note The RAM-SP can share a bay with the BAM-64.

Ordering Hardware Components and Accessories

Overview Your OmniRemote has been custom-built. It should be shipped with all necessary hardware components and accessories. However, if you wish to upgrade your instrument, the hardware components and accessories listed below are for use with the OmniRemote.

Ordering Order hardware components and accessories from Badger Technology, Inc. by part number. See the table below.

Hardware Components and Accessories	Part Number
OmniRemote Shelf with Data Ports	M01-20230-01
Dial-up modem for the MCI card (28.8 Kbps)	A04-20231-01
Dial-up cell phone modem for the MCI card (9.6 Kbps)	P971000235
OmniRemote Shelf with 10BaseT Hub	M01-20235-02
Bistate Analog Module (BAM-64)	A04-20233-01
BAM-64 50-pin cable: 10 feet, SCSI I to SCSI II (telco C50)	PK45-20405-01
BAM-64 50-pin cable: 25 feet, SCSI I to SCSI II (telco C50)	PK45-20405-02
Serial Alarm Module (SAM-10)	A04-20228-01
SAM-10 RS-530 cable: 10 feet, DB-25, for RS-530 port to RS-530 DCE device	PK45-20410-01
Router Access Module, Dual Port (RAM-DP)	A04-20240-01
RAM -DP RS-530 cable: 10 feet, DB-25, for V.35 WAN to RS-530 DCE device	PK45-20408-01
RAM -DP WAN slots:	
V.35 card, DB-25	A04-20241-01
V.24/RS-232 card, DB-25	A04-20242-01
RS-422 card, DB-25	A04-20243-01
X.21 card, DB-25	A04-20244-01
ISDN/U card, RJ-45 (built-in NT1 unit)	A04-20246-01
56K DSU/CSU card, RJ-48S	A04-20247-01
64K DSU/CSU card, RJ-48S	A04-20248-01
Router Access Module, Single Port (RAM-SP)	A04-20240-02
RAM -SP RS-530 cable: 10 feet, DB-25, for V.35 WAN to RS-530 DCE device	PK45-20409-01

Installing the OmniRemote Shelf with Data Ports

4

Chapter Summary

In this Chapter This following topics are covered in this chapter:

Topic	See Page
About the OmniRemote Shelf with Data Ports	4-2
Before Installing the OmniRemote Shelf with Data Ports	4-5
Installing the OmniRemote Shelf with Data Ports	4-7
MCI Card Configurations	4-11
What Next?	4-14

About the OmniRemote Shelf with Data Ports

How the Shelf with Data Ports Works The OmniRemote™ Shelf with Data Ports works with both the Bistate Analog Module (BAM) and Serial Alarm Module (SAM).

More here?

About the Front Panel The front panel is illustrated in the figure below. See the table that follows for a description of each item on the front panel.

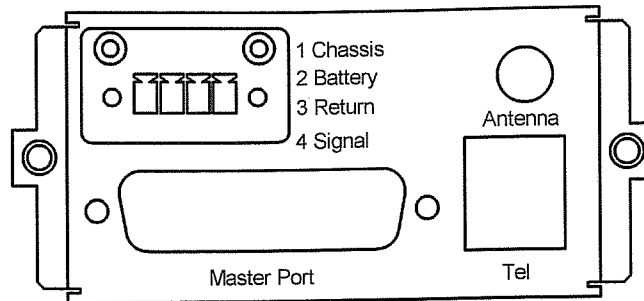
Need diagram of the MCI card front panel.

MCI card: Front Panel Items

Item	Description
Craft port (asynchronous)	Connects to a laptop computer, usually through Channel B. <ul style="list-style-type: none">◆ Connector: RJ45◆ Electrical: RS-232◆ Baud rates: 1200, 2400, 4800, 9600, 38400, 57600◆ Externally, DCE for DTE device compatibility
OFF HOOK LED	When lit, indicates that the internal wireline or cell phone modem is off the hook.
CH.B TX LED	When lit, indicates that transmission is occurring through Channel B.
CH.A TX LED	When lit, indicates that transmission is occurring through Channel A.
MCI POWER LED	When lit, indicates that the MCI card is on; the MCI card supplies power to the entire OmniRemote.

About the Rear Panel

The rear panel is illustrated in the figure below. See the table that follows for a description of each item on the rear panel.



MCI card: Rear Panel Items

Item	Description
Power supply, both male and female parts	Has connections for the following: <ul style="list-style-type: none"> ◆ Chassis ground (1) ◆ Battery power (2) ◆ Battery return (3) ◆ Signal ground (4)
RJ11 connector (Tel)	Connects to a telephone line (PSTN), supporting Channel B. <ul style="list-style-type: none"> ◆ Standards: V.42 bis, MNP5 ◆ Baud rates: 300 to 33600
DB25 connector (Master Port)	The Channel A DB25 connector can be jumper-selected for asynchronous or synchronous operation. <p>Asynchronous</p> <ul style="list-style-type: none"> ◆ Number: Two ports (bridged) ◆ Electrical: RS-232 or RS-422 ◆ Baud rates: 1200, 2400, 4800, 9600, 38400, 57600 ◆ DTE <p>Synchronous (with a SAM only)</p> <ul style="list-style-type: none"> ◆ Number: One port ◆ Electrical: RS-422, EIA530 ◆ Baud rates: Up to 128000 ◆ DTE <p>Note See the "Pin-out Table" on page 4-13.</p>
Antenna connector	Connects to a cell phone modem, supporting Channel B. <ul style="list-style-type: none"> ◆ Standards: AMPS Switched Circuit Cellular, V.42 bis, MNP10 ◆ Baud rates: 9600

About the Modems The OmniRemote Shelf with Data Ports supports either a wireline modem or a cell phone modem.

The dial-out phone numbers are configured by the Data Acquisition Device (DAD) Control application.

The cell phone modem is configured by... TBD (See Yung.)

About Channel A Channel A supports one of the following:

- ◆ Two asynchronous RS-232 or RS-422 serial data ports (bridged), using the rear DB25 connector (RS-530 Standard)
- ◆ One synchronous RS-422 serial data port, using the rear DB25 connector (RS-530 Standard)

Channel A is typically used as a dedicated channel to the Network Management System (NMS).

Note For a description of Channel A bridging, see "MCI Card Configurations" on page 4-11.

About Channel B Channel B supports one of the following:

- ◆ A wireline modem, using the rear RJ11 connector (Tel)
- ◆ A cell phone modem with antenna

Channel B is typically used as a dial backup channel to the dedicated Channel A or Ethernet channel. Activation of the DCE RS-232 Craft port using the RJ45 connector on the front panel overrides any active Channel B communication session by going off-hook.

Before Installing the OmniRemote Shelf with Data Ports

Overview Your OmniRemote has been custom-built and is shipped to you fully assembled. Before you install the instrument, you must:

- ◆ Review all safety information (see “Safety Information” on page 2-1).
- ◆ Review the instrument requirements.
- ◆ Unpack and inspect the instrument.
- ◆ Gather the required tools/equipment.

Instrument Requirements

The table below lists the requirements for the OmniRemote.

Outer chassis dimensions	<ul style="list-style-type: none"> ◆ Depth: European 6U (9.75 inches) ◆ Height: Standard 1 RU (1.75 inches) ◆ Width: 17 inches <p>Note The outer dimensions include all protrusions such as cables, toggles, and connectors.</p> <p>IMPORTANT Sufficient space must be provided in the front and back of the mounting rack to permit access to the connectors and front panel switches.</p>
Mounting rack size	19 inches
Ambient temperature	0 to +55 °C (–4 to +131 °F)
Relative humidity	0 to 95%, non-condensing
Power supply	<ul style="list-style-type: none"> ◆ 15 W or 20 W ◆ Negative ground: +18 to +72 Vdc ◆ Positive ground: –18 to –72 Vdc
Fuse	Thermistor, 2.5 A at 60 Vdc
Channel A word requirements 8N1, 10–11 bits	<ul style="list-style-type: none"> ◆ 8 bit ◆ 1 start ◆ 1 stop ◆ Odd parity or no parity (programmed for CRC)
Channel B dial-up word requirements 8N1, 10 bits	<ul style="list-style-type: none"> ◆ 8 bit ◆ 1 start ◆ 1 stop ◆ No parity (programmed for CRC only)

Unpack and Inspect the OmniRemote

Unpack the OmniRemote and inspect it as follows:

Step	Action
1	Check the outside of the instrument for dents and scratches.
2	Carefully tilt the OmniRemote from side to side, listening for loose parts inside the instrument.
3	If you note any damage, contact Badger Technical Support. See "Technical Support" on page 1-5. CAUTION Do not apply power to the OmniRemote if there is any evidence of damage.
4	Keep the packing materials in case reshipment is necessary.

Tools/Equipment Required

You will need the following tools and equipment to install the OmniRemote Shelf with Data Ports:

- ◆ #2 Phillips screwdriver
- ◆ Four screws, sized to fit your rack, and an appropriate screwdriver
- ◆ Small flathead screwdriver
- ◆ 16- to 22-gauge, solid or stranded insulated wire
- ◆ 3/32" slotted screwdriver
- ◆ RS-232 or RS-422 transceiver
- ◆ Rack cables

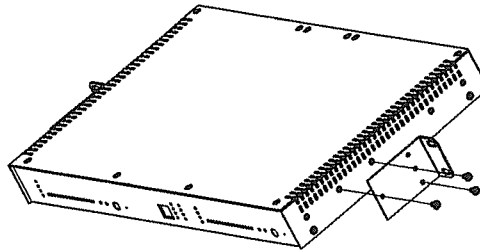
Installing the OmniRemote Shelf with Data Ports

Overview To install the OmniRemote Shelf with Data Ports, you must perform the following steps:

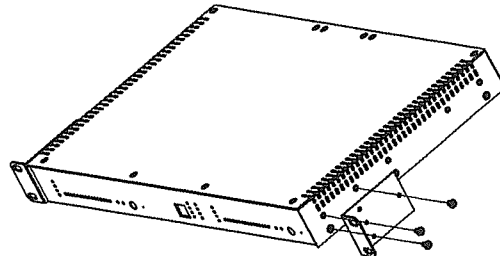
- ◆ Mount the OmniRemote on the mounting rack.
- ◆ Test the power.
- ◆ Make the external communication connections.

Mounting the OmniRemote The OmniRemote can be mounted in one of the following positions:

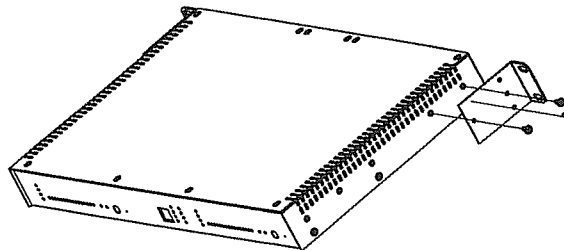
- ◆ Center mount



- ◆ Front mount



- ◆ Rear mount



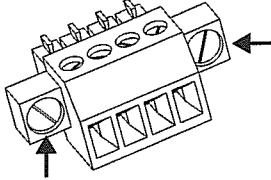
To mount the OmniRemote Shelf with Data Ports:

Step	Action								
1	<p>Find and record the BAM-64 address. You will need this number to configure the BAM software.</p> <p>Note The BAM-64 address is listed in the OmniRemote Data Port Shelf label on the top of your OmniRemote. If you need to change the BAM-64 address, see the <i>BAM Installation Manual</i>.</p>								
2	<table border="1"> <thead> <tr> <th data-bbox="592 493 868 535">If would like a...</th> <th data-bbox="868 493 1453 535">Then...</th> </tr> </thead> <tbody> <tr> <td data-bbox="592 535 868 630">Center mount,</td> <td data-bbox="868 535 1453 630">Proceed to step 3 below. The OmniRemote is shipped with the mounting brackets in the center-mount position.</td> </tr> <tr> <td data-bbox="592 630 868 871">Front mount,</td> <td data-bbox="868 630 1453 871"> <ul style="list-style-type: none"> a. Use a #2 Phillips screwdriver to unscrew the two mounting brackets. There are three screws on each mounting bracket. b. Move the mounting brackets to the front-mount position, as shown above. c. Re-insert and tighten the screws. d. Proceed to step 3 below. </td> </tr> <tr> <td data-bbox="592 871 868 1113">Rear mount,</td> <td data-bbox="868 871 1453 1113"> <ul style="list-style-type: none"> a. Use a #2 Phillips screwdriver to unscrew the two mounting brackets. There are three screws on each mounting bracket. b. Move the mounting brackets to the rear-mount position, as shown above. c. Re-insert and tighten the screws. d. Proceed to step 3 below. </td> </tr> </tbody> </table>	If would like a...	Then...	Center mount,	Proceed to step 3 below. The OmniRemote is shipped with the mounting brackets in the center-mount position.	Front mount,	<ul style="list-style-type: none"> a. Use a #2 Phillips screwdriver to unscrew the two mounting brackets. There are three screws on each mounting bracket. b. Move the mounting brackets to the front-mount position, as shown above. c. Re-insert and tighten the screws. d. Proceed to step 3 below. 	Rear mount,	<ul style="list-style-type: none"> a. Use a #2 Phillips screwdriver to unscrew the two mounting brackets. There are three screws on each mounting bracket. b. Move the mounting brackets to the rear-mount position, as shown above. c. Re-insert and tighten the screws. d. Proceed to step 3 below.
If would like a...	Then...								
Center mount,	Proceed to step 3 below. The OmniRemote is shipped with the mounting brackets in the center-mount position.								
Front mount,	<ul style="list-style-type: none"> a. Use a #2 Phillips screwdriver to unscrew the two mounting brackets. There are three screws on each mounting bracket. b. Move the mounting brackets to the front-mount position, as shown above. c. Re-insert and tighten the screws. d. Proceed to step 3 below. 								
Rear mount,	<ul style="list-style-type: none"> a. Use a #2 Phillips screwdriver to unscrew the two mounting brackets. There are three screws on each mounting bracket. b. Move the mounting brackets to the rear-mount position, as shown above. c. Re-insert and tighten the screws. d. Proceed to step 3 below. 								
3	<p>Position the OmniRemote in your rack and screw the mounting brackets on. You will need two screws for each mounting bracket. See the diagram below.</p> <p>Need a diagram of the mounting brackets screwed onto the rack.</p> <p>IMPORTANT Secure metal-to-metal contact ensures a reliable chassis ground.</p>								
4	<p>Continue with "Testing the Power" on page 4-9.</p>								

Testing the Power

To make sure the OmniRemote is working, test the power before continuing with the installation.

To test the OmniRemote's power:

Step	Action
1	<p>Use a small flathead screwdriver to remove the male part of the power connector from the rear panel of the OmniRemote.</p>  <p>Unscrew these two screws.</p>
2	<p>Use 16- to 22-gauge, solid or stranded insulated wire to connect the Battery power (#2) and Battery return (#3) ports on the power connector to your power source.</p> <p>Use a 3/32" slotted screwdriver to tighten the flathead terminal screws.</p>
3	<p>Use a small flathead screwdriver to screw the power connector back on the rear panel of the OmniRemote.</p>
4	<p>The MCI POWER LED on the front panel of the OmniRemote should automatically be illuminated. Check the other LEDs as follows:</p> <ul style="list-style-type: none">◆ For the BAM-64, press LAMP TEST/BANK SELECT seven times. (Each press runs through a group of LEDs; on the seventh press, all of the BAM-64 LEDs should be illuminated.)◆ For the SAM-10, press LAMP TEST once.◆ For the RAM-DP, the LEDs should automatically turn red, then blink green. <p>Note If any of the LEDs do not illuminate, contact Technical Support. See "Technical Support" on page 1-5.</p>
5	<p>After you have tested the LEDs, disconnect the power. To do this, remove the male part of the power connector from the rear panel of the OmniRemote (see step 1 above). If desired, you can leave the Battery power (#2) and Battery return (#3) ports wired.</p> <p>IMPORTANT Disconnecting the power connector ensures the power will be turned off while you make all required communication connections.</p>
6	<p>Continue with "Making the External Communication Connections" on page 4-10.</p>

Making the External Communication Connections

The OmniRemote can use the RJ11 connector, DB25 connector, and cell phone antenna connector in any combination. For example, you may choose to connect only the DB25, and not connect either the RJ11 or antenna.

To make the external communication connections on the OmniRemote:

Step	Action								
1	<p>Make sure the power connector is disconnected (see step 5 of "Testing the Power" on page 4-9).</p> <p>IMPORTANT Disconnecting the power connector ensures the power will be turned off while you make all required communication connections.</p>								
2	<p>For the DB25 connector:</p> <p>a. Determine your OmniRemote's MCI card configuration:</p> <ul style="list-style-type: none"> - See the OmniRemote Data Port Shelf label on the top of your OmniRemote to see how your MCI card is configured. - See "MCI Card Configurations" on page 4-11 for a description of each of these configurations. <p>b. Connect either an RS-232 or RS-422 transceiver, following the "Pin-out Table" on page 4-13.</p>								
3	<table border="1"> <thead> <tr> <th>If you are using a...</th> <th>Then...</th> </tr> </thead> <tbody> <tr> <td>Wireline modem,</td> <td>Connect a telephone line to the RJ11 connector.</td> </tr> <tr> <td>Cell phone modem</td> <td>Connect the antenna.</td> </tr> <tr> <td>Third-party external modem</td> <td> <p>a. Connect a null modem into the RJ45 Craft port.</p> <p>b. Connect your third-party modem to the null modem.</p> </td> </tr> </tbody> </table>	If you are using a...	Then...	Wireline modem,	Connect a telephone line to the RJ11 connector.	Cell phone modem	Connect the antenna.	Third-party external modem	<p>a. Connect a null modem into the RJ45 Craft port.</p> <p>b. Connect your third-party modem to the null modem.</p>
If you are using a...	Then...								
Wireline modem,	Connect a telephone line to the RJ11 connector.								
Cell phone modem	Connect the antenna.								
Third-party external modem	<p>a. Connect a null modem into the RJ45 Craft port.</p> <p>b. Connect your third-party modem to the null modem.</p>								
4	<p>If they are not already connected, use 16- to 22-gauge, solid or stranded insulated wire to connect the Battery power (#2) and Battery return (#3) ports on the power connector to your power source.</p> <p>Use a 3/32" slotted screwdriver to tighten the flathead terminal screws.</p>								
5	<p>Use 16- to 22-gauge, solid or stranded insulated wire to connect the Chassis ground (#1) and Signal ground (#4) ports on the power connector to ground terminations provided at your site.</p> <p>Use a 3/32" slotted screwdriver to tighten the flathead terminal screws.</p>								
6	<p>Use a small flathead screwdriver to screw the power connector back on the rear panel of the OmniRemote.</p>								
7	<p>Your OmniRemote Shelf with Data Ports is now installed. Continue with "What Next?" on page 4-14.</p>								

MCI Card Configurations

Possible Configurations The MCI card Channel A serial port can be configured in one of three ways, as described in the table below. See the OmniRemote Data Port Shelf label on the top of your OmniRemote to see how your MCI card is configured.

The MCI card Channel B serial port is RS-232 only and is used for modem or Craft port communications.

Note The MCI card is configured in the factory according to your specifications. If you wish to re-configure it, see Appendix B.

Configuration	Description
Asynchronous RS-232	<p>The asynchronous RS-232 configuration is used primarily for dedicated master communications.</p> <p>In this configuration, both external ports are active.</p> <ul style="list-style-type: none"> ◆ The first external port is for relaying master communications upstream. It supports full serial signaling using RTS and CTS flow control. When there is no internal transmission output, the RTS is raised so the master sees CTS and knows it can transmit. ◆ The second external port is for relaying master communications downstream (<i>e.g.</i>, to other OmniRemotes). It supports only TX and RX signaling. <p>Note The BAM alarm management protocol provides for channel contention resolution using a polling mechanism. A received message on one port is automatically re-transmitted to the other port with no buffering. The MCI card raises RTS when it receives a downstream slave TX message.</p>
Asynchronous RS-422	<p>The asynchronous RS-422 configuration is used primarily for dedicated master communications.</p> <p>In this configuration, one or two external ports are active.</p> <ul style="list-style-type: none"> ◆ The first external port is for relaying master communications upstream. It supports full serial signaling using RTS and CTS flow control. When there is no internal transmission output, the RTS is raised so the master sees CTS and knows it can transmit. ◆ The second external port is for relaying master communications downstream (<i>e.g.</i>, to other OmniRemotes). It supports only TX and RX signaling. The MCI card must be jumpered to activate the second downstream RS-422 port. <p>Note The BAM alarm management protocol provides for channel contention resolution using a polling mechanism. A received message on one port is automatically re-transmitted to the other port with no buffering. The MCI card raises RTS when it receives a downstream slave TX message.</p>

Configuration	Description
Synchronous RS-422	<p>The synchronous RS-422 configuration is used primarily for a single port, DSU high-speed interface. Full, balanced RS-422 signaling is supported using a reference clock. (A SAM/MCI configuration does not generate a source clock.)</p> <p>In this configuration, only one external port is active.</p> <p>The Reference Clock is jumpered on the MCI card as a transmit clock or a receive clock.</p>

**RS-232 and RS-422
Comparison**

RS-232
RS-232 transmission uses a single voltage (12 V) to indicate a binary 0 or 1 value. This means that large voltage swings are required to transmit data, which slows the maximum data rate. The maximum recommended distance for RS-232 transmission is 50 feet at 1200 bps.

The MCI card in the Data Port Shelf has a built-in bridge for upstream and downstream RS-232 communications. RTS/CTS is supported on the upstream port.

RS-422

RS-422 transmission uses a dual, balanced voltage (± 7 V) on two different wires. The voltage on each receive pair is compared to indicate a binary 0 or 1 value. Due to this lower voltage and the increased reliability of two wires, RS-422 transmission allows faster data rates at greater distances. There is also less inter-signal crosstalk (noise?). RS-422 transmission can be multidropped without requiring a bridge for each device.

Note The RS-422 cable must be terminated at each end.

Pin-out Table The table below shows the pin-outs for each MCI card configuration. Refer to this table when you are performing the steps in “Making the External Communication Connections” on page 4-10.

Pin	Asynchronous RS-232		Asynchronous RS-422		Synchronous RS-422
	Upstream	Downstream	Upstream	Downstream	Host
1	Shield ground	Shield ground	Shield ground	Shield ground	Shield ground
2	TX		TX+		TX+
3	RX		RX+		RX+
4	RTS		RTS+		RTS+
5	CTS		CTS+		CTS+
6	DSR		DSR+		DSR+
7	Signal ground	Signal ground	Signal ground	Signal ground	Signal ground
8	Not connected	Not connected	Not connected	Not connected	Not connected
9			RX-		RX-
10				TX-	
11		TX		TX+	
12					TX clock-
13			CTS-		CTS-
14			TX-		TX-
15					TX clock+
16			RX-		RX-
17					RX clock+
18			DTR-		DTR-
19			RTS-		RTS-
20	DTR		DTR+		DTR+
21			DSR-		DSR-
22	Signal ground	Signal ground	Signal ground	Signal ground	Signal ground
23	Signal ground	Signal ground	Signal ground	Signal ground	Signal ground
24		RX		RX+	
25				RX-	

What Next?

Complete Installation Procedures

The table below lists the procedures required to completely install an OmniRemote. You have just completed Procedure No. 1. See the table for instructions on what to do next.

No.	Procedure	What Next?
1	Install the OmniRemote Shelf into the rack, connect the power, and connect the primary host communications.	You have completed this procedure. See Procedure No. 2 below.
2	Hook-up the OmniRemote BAM, SAM, RAM-DP, or RAM-SP.	Refer to the following, as appropriate: <ul style="list-style-type: none">◆ <i>BAM Installation Manual</i>◆ <i>SAM Installation Manual</i>◆ <i>RAM-DP Installation Manual</i>◆ <i>RAM-SP Installation Manual</i>
3	Provision the BAM and/or SAM configuration variables.	Refer to the following, as appropriate: <ul style="list-style-type: none">◆ <i>DAD Provisioner's Manual</i>◆ <i>DAD/BAM-64 Application Notes</i>◆ <i>Other DAD Application Notes</i>

Installing the OmniRemote Shelf with 10BaseT Hub

5

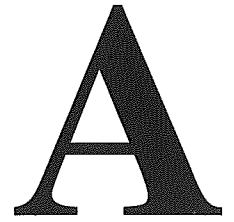
Chapter Summary

In this Chapter This following topics are covered in this chapter:

TBD

Topic	See Page

Troubleshooting



Appendix Summary

In this Chapter This following topics are covered in this chapter:

Topic	See Page
Troubleshooting the 10BaseT Hub	A-2

Troubleshooting the 10BaseT Hub

Troubleshooting Table Use this table if you are having problems installing the OmniRemote Shelf with the 10BaseT Hub.

TBD (Per Zane, can test for power, Ethernet pings, etc.)

Observation	Possible Cause	Recommended Action

Reconfiguring the MCI Card Serial Ports

B

In this Appendix The following topics are covered in this appendix:

Topic	Page
Before Reconfiguring the MCI Card Serial Ports	B-2
Reconfiguring the MCI Card Serial Ports	B-3

Before Reconfiguring the MCI Card Serial Ports

Overview You may wish to reconfigure the Master Communications Interface (MCI) card serial ports on your OmniRemote™. Before continuing with these procedures, you must:

- ◆ Review all safety information (see “Safety Information” on page 2-1).
- ◆ Gather the required tools/equipment.

Tools/Equipment Required You will need the following tools and equipment to perform these procedures:

- ◆ Grounding wrist strap
 - ◆ Small flathead screwdriver
 - ◆ An appropriate screwdriver for the four screws holding the mounting brackets to your mounting rack
 - ◆ #2 Phillips screwdriver
-

Reconfiguring the MCI Card Serial Ports

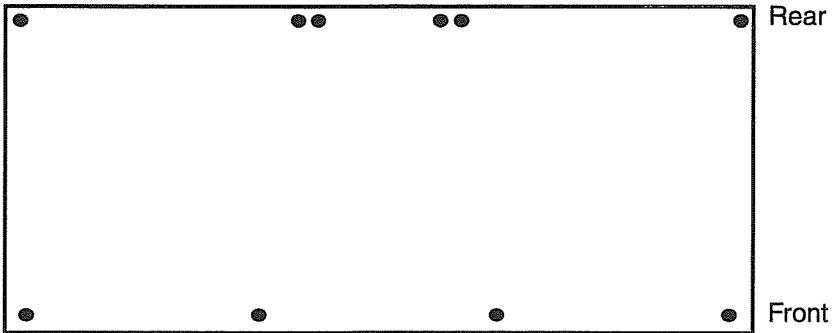
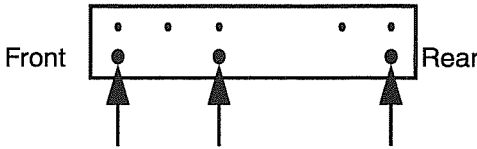
Overview To reconfigure the MCI card serial ports, you must perform the following steps:

- ◆ Remove the chassis cover.
- ◆ Reset the jumpers and dipswitches.
- ◆ Replace the chassis cover.

! WARNING ! Wear a grounding wrist strap while performing these procedures.

Removing the Chassis Cover

To remove the chassis cover:

Step	Action
1	<p>Make sure all of your communications and power cables are labeled, then disconnect all of these cables from the OmniRemote.</p> <p>Note You will need a small flathead screwdriver to remove the flathead terminal screws.</p>
2	<p>Unscrew the two mounting brackets from the mounting rack. Remove the OmniRemote from the mounting rack and place it on a workbench.</p>
3	<p>Use a #2 Phillips screwdriver to:</p> <p>a. Remove all 10 screws from the top of the chassis cover.</p>  <p>b. Remove the bottom three screws on each side of the chassis cover.</p> 
4	<p>Remove the chassis cover and set it aside.</p>
5	<p>Continue with "Replacing the Chassis Cover" on page B-4.</p>

Resetting the Jumpers and Dipswitches

To remove the chassis cover and reset the jumpers:

Step	Action
1	See the OmniRemote Data Port Shelf Label on the top of your OmniRemote to see how your MCI card is currently configured.
2	Reset the MCI card jumpers and dipswitches as appropriate. You may choose one of the following configurations: <ul style="list-style-type: none">◆ Asynchronous RS-232◆ Asynchronous RS-422◆ Synchronous RS-422 See "MCI Card Jumper and Dipswitch Settings" on page B-5 to see the jumper settings for each configuration.
3	Continue with "Replacing the Chassis Cover" below.

Replacing the Chassis Cover

None of the cards had to come out or be disconnected just to reset the jumpers, right?

To replace the chassis cover:

1	Replace the OmniRemote's chassis cover. Use a #2 Phillips screwdriver to: <ul style="list-style-type: none">a. Re-insert all 10 screws on the top of the chassis cover.b. Re-insert the bottom three screws on each side of the chassis cover.
2	Place the OmniRemote back in the mounting rack and screw on the mounting brackets.
3	Reconnect all of your external communications and power cables.

MCI Card Jumper and Dipswitch Settings

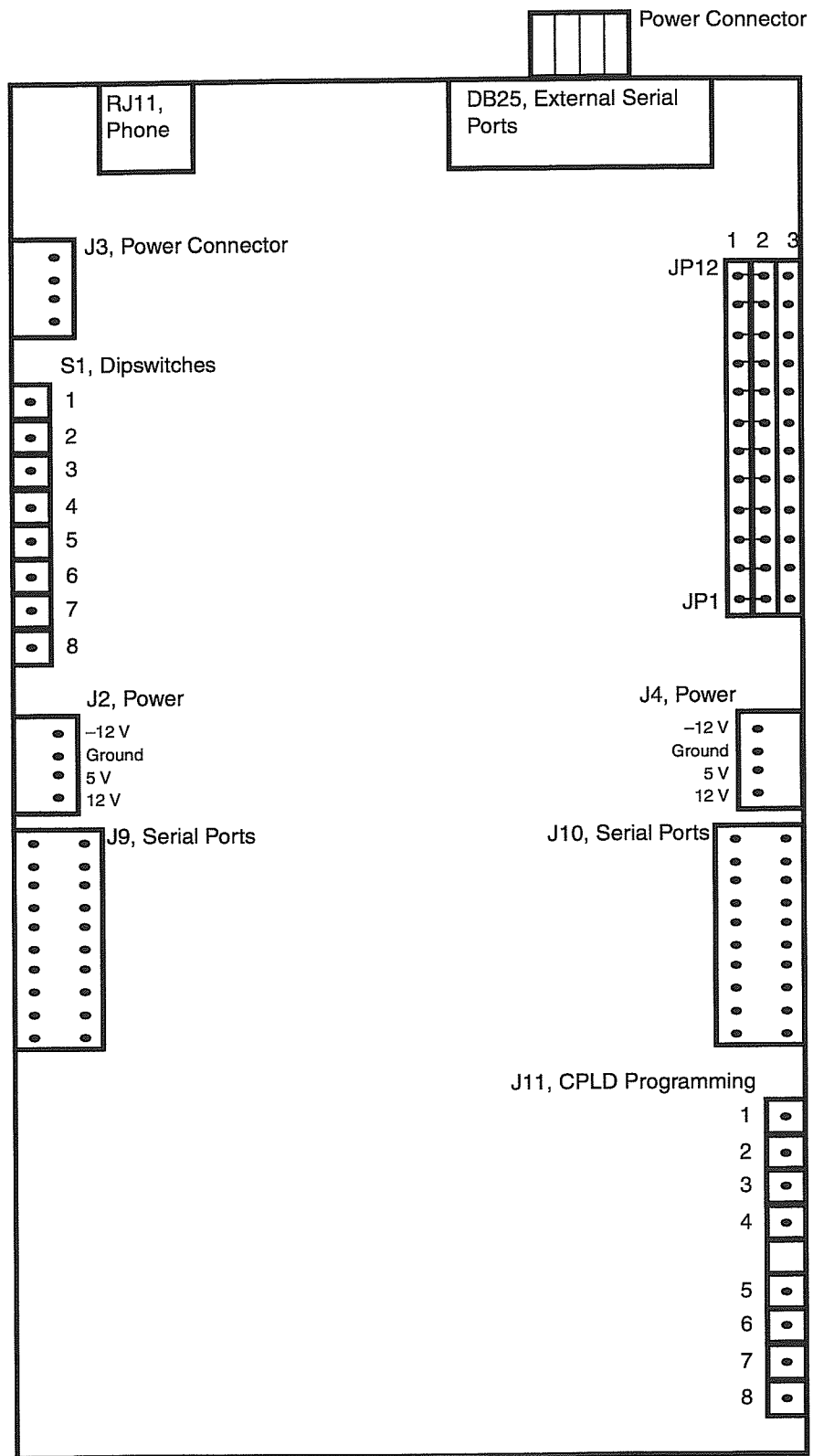
Asynchronous RS-232 Configuration For a description of the Asynchronous RS-232 configuration, see "Possible Configurations" on page 4-11.

Jumper	Pin		
	1	2	3
JP1	●	●	●
JP2	●	●	●
JP3	●	●	●
JP4	●	●	●
JP5	●	●	●
JP6	●	●	●
JP7	●	●	●
JP8	●	●	●
JP9	●	●	●
JP10	●	●	●
JP11	●	●	●
JP12	●	●	●

Not sure which dipswitch configurations go with which modes.

Mode	S1 Dipswitches								Clock	
	1	2	3	4	5	6	7	8		
Synchronous	O	O	Unused							RXD
Synchronous	I	O	Unused							TXD
Asynchronous	O	I	Unused							None
Asynchronous	I	I	Unused							None

**MCI Card in
Asynchronous
RS-232
Configuration**



**Asynchronous
RS-422
Configuration**

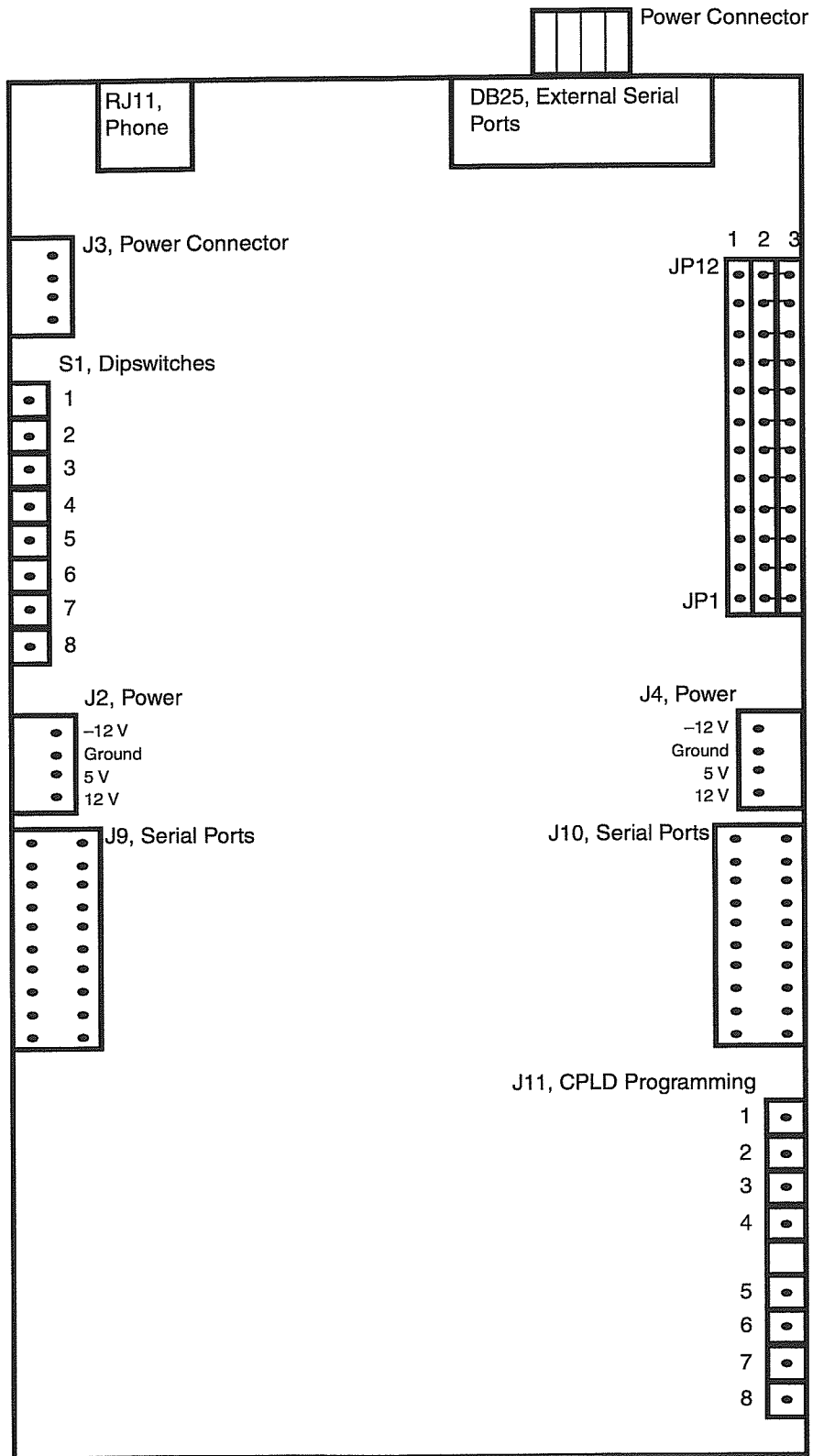
For a description of the Asynchronous RS-422 configuration, see "Possible Configurations" on page 4-11.

Jumper	Pin		
	1	2	3
JP1	●	●	●
JP2	●	●	●
JP3	●	●	●
JP4	●	●	●
JP5	●	●	●
JP6	●	●	●
JP7	●	●	●
JP8	●	●	●
JP9	●	●	●
JP10	●	●	●
JP11	●	●	●
JP12	●	●	●

Not sure which dipswitch configurations go with which modes.

Mode	S1 Dipswitches								Clock	
	1	2	3	4	5	6	7	8		
Synchronous	O	O	Unused							RXD
Synchronous	I	O	Unused							TXD
Asynchronous	O	I	Unused							None
Asynchronous	I	I	Unused							None

**MCI Card in
Asynchronous
RS-422
Configuration**



Synchronous RS-422 Configuration

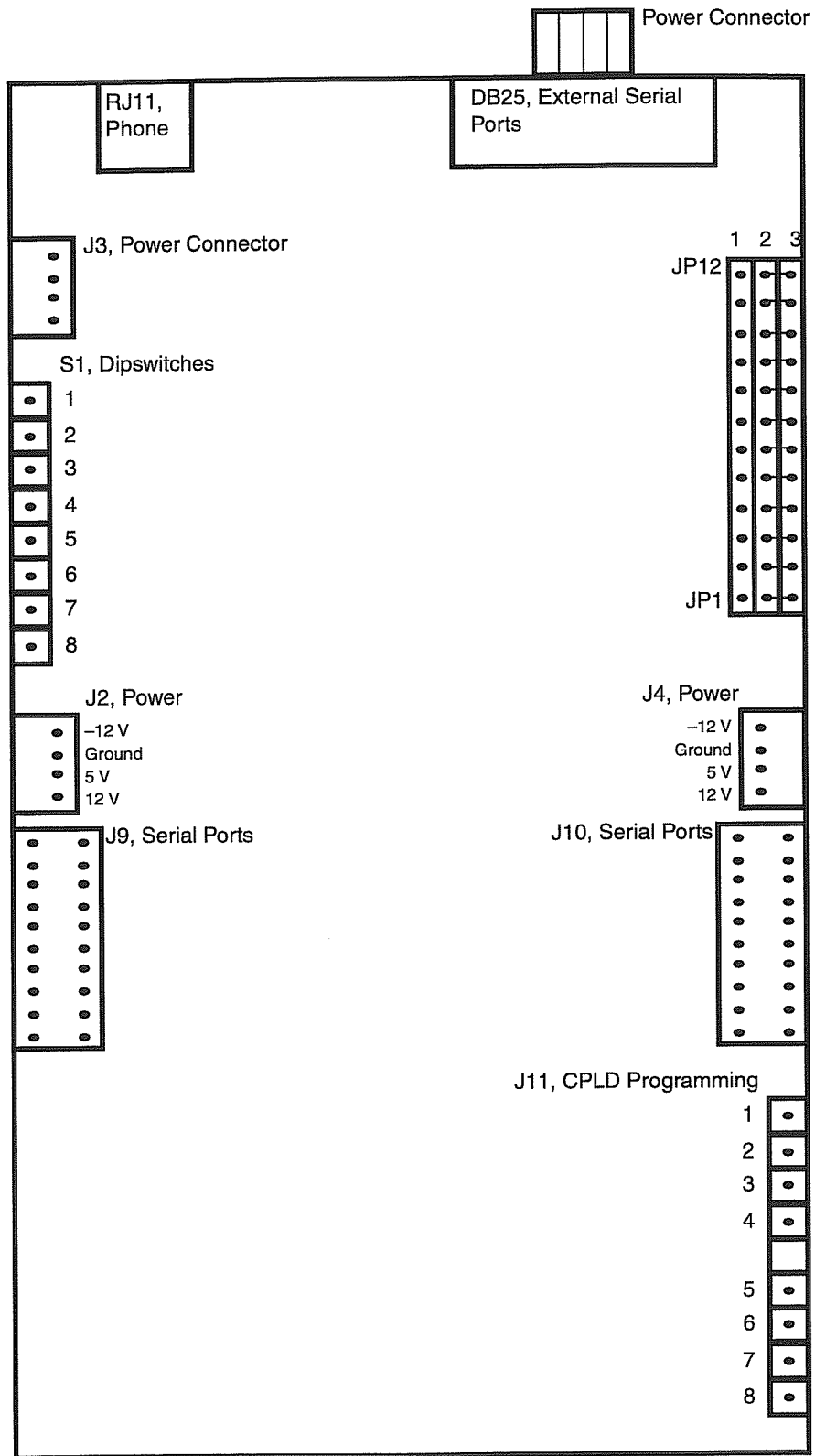
For a description of the Synchronous RS-422 configuration, see "Possible Configurations" on page 4-11.

Jumper	Pin		
	1	2	3
JP1	●	●	●
JP2	●	●	●
JP3	●	●	●
JP4	●	●	●
JP5	●	●	●
JP6	●	●	●
JP7	●	●	●
JP8	●	●	●
JP9	●	●	●
JP10	●	●	●
JP11	●	●	●
JP12	●	●	●

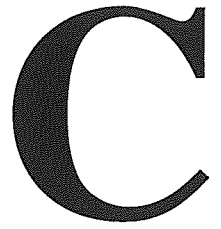
Not sure which dipswitch configurations go with which modes.

Mode	S1 Dipswitches								Clock	
	1	2	3	4	5	6	7	8		
Synchronous	0	0	Unused							RXD
Synchronous	1	0	Unused							TXD
Asynchronous	0	1	Unused							None
Asynchronous	1	1	Unused							None

MCI Card in Synchronous RS-422 Configuration



Installing/Removing a Modem



Appendix Summary

In this Appendix The following topics are covered in this appendix:

Topic	Page
Before Installing/Removing a Modem	C-2
Installing a Modem on the MCI Card	C-3
Removing a Modem from the MCI Card	C-9

Before Installing/Removing a Modem

Overview You may wish to customize your OmniRemote™ by installing or removing a wireline or cell phone modem. Before continuing with these procedures, you must:

- ◆ Review all safety information (see "Safety Information" on page 2-1).
- ◆ Gather the required tools/equipment.

Tools/Equipment Required You will need the following tools and equipment to perform these procedures:

- ◆ Small flathead screwdriver
 - ◆ An appropriate screwdriver for the four screws holding the mounting brackets to your mounting rack
 - ◆ #2 Phillips screwdriver
 - ◆ Two #632 standoffs
 - ◆ SMA or SMC connector
-

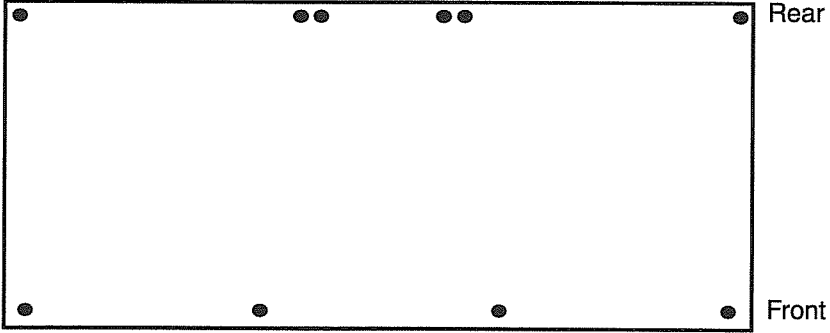
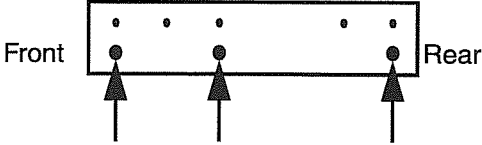
Installing a Modem on the MCI Card

Overview To install a modem on the Master Communications Interface (MCI) card, you must perform the following steps:

- ◆ Remove the chassis cover.
- ◆ Disassemble the OmniRemote.
- ◆ Position the standoffs.
- ◆ Connect the modem.

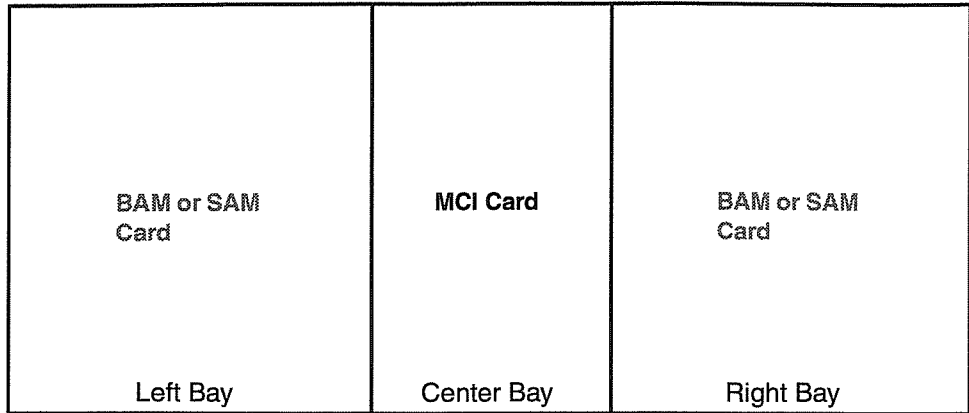
Removing the Chassis Cover

To remove the chassis cover:

Step	Action
1	<p>Make sure all of your communications and power cables are labeled, then disconnect all of these cables from the OmniRemote.</p> <p>Note You will need a small flathead screwdriver to remove the flathead terminal screws.</p>
2	<p>Unscrew the two mounting brackets from the mounting rack. Remove the OmniRemote from the mounting rack and place it on a workbench.</p>
3	<p>Use a #2 Phillips screwdriver to:</p> <p>a. Remove all 10 screws from the top of the chassis cover.</p>  <p>b. Remove the bottom three screws on each side of the chassis cover.</p> 
4	<p>Remove the chassis cover and set it aside.</p>
5	<p>Continue with "Disassembling the OmniRemote" on page C-4.</p>

Disassembling the OmniRemote

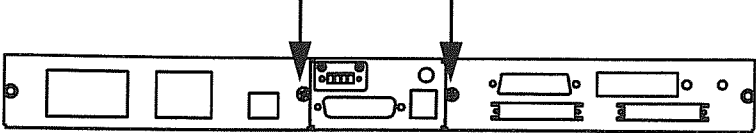
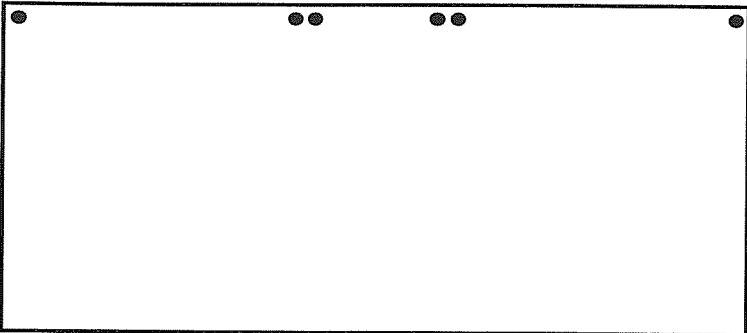
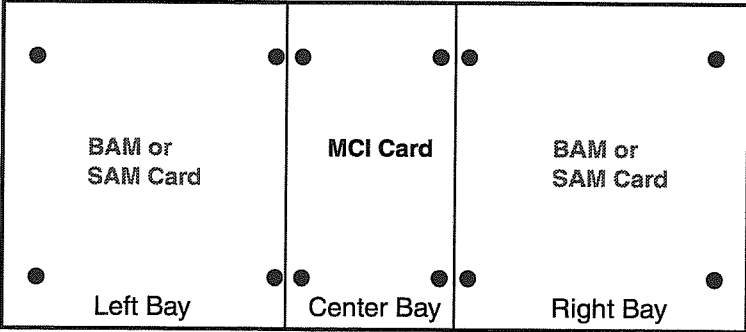
The diagram below shows the three bays of the OmniRemote. Refer to this diagram as you perform the following procedures.



To disassemble the OmniRemote:

Step	Action															
1	<p>Disconnect the power cables from all of the cards.</p> <table border="1"> <thead> <tr> <th>If you have a...</th> <th>Then...</th> </tr> </thead> <tbody> <tr> <td>BAM card in the left bay,</td> <td>the white cable goes from the J4 serial port on the BAM to the J2 serial port on the MCI card.</td> </tr> <tr> <td>BAM card in the right bay,</td> <td>the white cable goes from the J2 serial port on the BAM to the J4 serial port on the MCI card.</td> </tr> <tr> <td>SAM card in the right bay,</td> <td>the white cable goes from the J2 serial port on the SAM to the J4 serial port on the MCI card.</td> </tr> <tr> <td>SAM card in the left bay,</td> <td>the white cable goes from the J4 serial port on the SAM to the J2 serial port on the MCI card.</td> </tr> </tbody> </table>	If you have a...	Then...	BAM card in the left bay,	the white cable goes from the J4 serial port on the BAM to the J2 serial port on the MCI card.	BAM card in the right bay,	the white cable goes from the J2 serial port on the BAM to the J4 serial port on the MCI card.	SAM card in the right bay,	the white cable goes from the J2 serial port on the SAM to the J4 serial port on the MCI card.	SAM card in the left bay,	the white cable goes from the J4 serial port on the SAM to the J2 serial port on the MCI card.					
If you have a...	Then...															
BAM card in the left bay,	the white cable goes from the J4 serial port on the BAM to the J2 serial port on the MCI card.															
BAM card in the right bay,	the white cable goes from the J2 serial port on the BAM to the J4 serial port on the MCI card.															
SAM card in the right bay,	the white cable goes from the J2 serial port on the SAM to the J4 serial port on the MCI card.															
SAM card in the left bay,	the white cable goes from the J4 serial port on the SAM to the J2 serial port on the MCI card.															
2	<p>Disconnect the communications cables from all of the cards.</p> <table border="1"> <thead> <tr> <th>If you have a...</th> <th>And you...</th> <th>Then...</th> </tr> </thead> <tbody> <tr> <td>SAM card in the right bay</td> <td>do not have a BAM card,</td> <td>the blue ribbon cable goes from the J1 serial port on the SAM to the J10 serial port on the MCI card.</td> </tr> <tr> <td>SAM card in the right bay</td> <td>do have a BAM card,</td> <td>the blue Y-cable goes from the J9 serial port on the SAM to the J1 serial port on the BAM.</td> </tr> <tr> <td>SAM card in the left bay</td> <td>do not have a BAM card,</td> <td>the blue ribbon cable goes from the J6 serial port on the SAM to the J9 serial port on the MCI card.</td> </tr> <tr> <td>SAM card in the left bay</td> <td>do have a BAM card,</td> <td>the blue Y-cable goes from the J9 serial port on the SAM to the J6 serial port on the BAM.</td> </tr> </tbody> </table>	If you have a...	And you...	Then...	SAM card in the right bay	do not have a BAM card,	the blue ribbon cable goes from the J1 serial port on the SAM to the J10 serial port on the MCI card.	SAM card in the right bay	do have a BAM card,	the blue Y-cable goes from the J9 serial port on the SAM to the J1 serial port on the BAM.	SAM card in the left bay	do not have a BAM card,	the blue ribbon cable goes from the J6 serial port on the SAM to the J9 serial port on the MCI card.	SAM card in the left bay	do have a BAM card,	the blue Y-cable goes from the J9 serial port on the SAM to the J6 serial port on the BAM.
If you have a...	And you...	Then...														
SAM card in the right bay	do not have a BAM card,	the blue ribbon cable goes from the J1 serial port on the SAM to the J10 serial port on the MCI card.														
SAM card in the right bay	do have a BAM card,	the blue Y-cable goes from the J9 serial port on the SAM to the J1 serial port on the BAM.														
SAM card in the left bay	do not have a BAM card,	the blue ribbon cable goes from the J6 serial port on the SAM to the J9 serial port on the MCI card.														
SAM card in the left bay	do have a BAM card,	the blue Y-cable goes from the J9 serial port on the SAM to the J6 serial port on the BAM.														

To disassemble the OmniRemote: *(continued)*

Step	Action
3	<p>Use a #2 Phillips screwdriver to remove the two screws from the back of the OmniRemote (on either side of the MCI card rear panel).</p> 
4	<p>Use a #2 Phillips screwdriver to remove the bottom screws from each card in the chassis. Each card has two bottom screws.</p> 
5	<p>Use a #2 Phillips screwdriver to remove the top screws from each card in the chassis. Each card has four top screws.</p> 
6	<p>Remove all the cards from the chassis and set them aside.</p>
7	<p>Continue with "Positioning the Standoffs" on page C-6.</p>

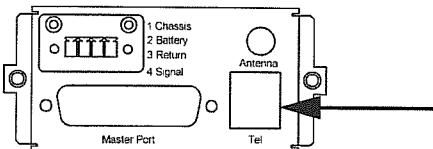
Positioning the Standoffs

To position the standoffs:

Step	Action						
1	There are three holes in the bottom of the chassis for the standoffs.						
	<table border="1"> <thead> <tr> <th>If you are installing...</th> <th>Then...</th> </tr> </thead> <tbody> <tr> <td>A wireline modem,</td> <td>Use a #2 Phillips screwdriver to screw a #632 standoff in the first and second holes. Need a diagram.</td> </tr> <tr> <td>A cell phone modem,</td> <td>Use a #2 Phillips screwdriver to screw a #632 standoff in the first and third holes. Need a diagram.</td> </tr> </tbody> </table>	If you are installing...	Then...	A wireline modem,	Use a #2 Phillips screwdriver to screw a #632 standoff in the first and second holes. Need a diagram.	A cell phone modem,	Use a #2 Phillips screwdriver to screw a #632 standoff in the first and third holes. Need a diagram.
	If you are installing...	Then...					
A wireline modem,	Use a #2 Phillips screwdriver to screw a #632 standoff in the first and second holes. Need a diagram.						
A cell phone modem,	Use a #2 Phillips screwdriver to screw a #632 standoff in the first and third holes. Need a diagram.						
2	Insert the MCI card in the center bay, positioning it over the standoffs. Insert the remaining two cards in the left and right bays, as appropriate.						
3	Use a #2 Phillips screwdriver to re-insert the top screws in each card in the chassis. Each card has four top screws.						
4	Use a #2 Phillips screwdriver to re-insert the bottom screws in each card in the chassis. Each card has two bottom screws.						
5	Use a #2 Phillips screwdriver to re-insert the two screws in the rear panel of the OmniRemote.						
6	Reconnect the communications and power cables on all of the cards. For a list of cables, see steps 1–2 of "Disassembling the OmniRemote" on page C-4.						
7	Continue with "Connecting the Modem" on page C-7.						

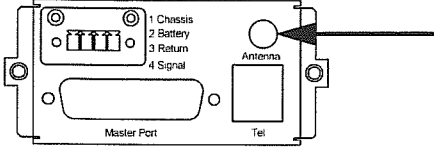
Connecting the Modem Wireline Modem

To connect a wireline modem:

Step	Action																																			
1	<p>Find the S1 dipswitches on the MCI card. Change the configuration to Asynchronous RS-232 mode (Channel B), as shown below.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Mode</th> <th colspan="8">S1 Dipswitches</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> </tr> </thead> <tbody> <tr> <td>Asynchronous RS-232</td> <td style="text-align: center;">O</td> <td style="text-align: center;">I</td> <td colspan="6" style="text-align: center;">Unused</td> </tr> <tr> <td>Which way?</td> <td style="text-align: center;">I</td> <td style="text-align: center;">I</td> <td colspan="6"></td> </tr> </tbody> </table>	Mode	S1 Dipswitches								1	2	3	4	5	6	7	8	Asynchronous RS-232	O	I	Unused						Which way?	I	I						
Mode	S1 Dipswitches																																			
	1	2	3	4	5	6	7	8																												
Asynchronous RS-232	O	I	Unused																																	
Which way?	I	I																																		
2	<p>Position the wireline modem on the MCI card:</p> <ol style="list-style-type: none"> Insert the two standoffs in the holes on the wireline modem. Connect the xx (top plug) on the wireline modem to the xx on the MCI card. <p>Need a diagram showing the wireline modem over the MCI card, pointing out the standoffs and the top plug.</p>																																			
3	<p>Configure the Craft port for the telephone numbers. See the <i>DAD/BAM Application Notes</i> for instructions.</p>																																			
4	<p>Replace the OmniRemote's chassis cover. Use a #2 Phillips screwdriver to:</p> <ol style="list-style-type: none"> Re-insert all 10 screws on the top of the chassis cover. Re-insert the bottom three screws on each side of the chassis cover. 																																			
5	<p>Place the OmniRemote back in the mounting rack and screw on the mounting brackets.</p> <p>Note If necessary, refer to "Mounting the OmniRemote" on page 4-7 for detailed instructions.</p>																																			
6	<p>Reconnect all of your communications and power cables.</p> <p>Note If necessary, refer to "Making the External Communication Connections" on page 4-10 for detailed instructions.</p>																																			
7	<p>Connect a telephone line to the RJ11 connector (Tel) on the rear panel of the MCI card.</p> <div style="text-align: center;">  <p>The diagram shows the rear panel of the MCI card with several components labeled: '1 Chassis', '2 Battery', '3 Return', '4 Signal' (pointing to a set of four pins), 'Master Port', 'Tel' (an RJ11 connector), and 'Antenna'. An arrow points from the right towards the 'Tel' connector.</p> </div> <p>Your wireline modem is now installed.</p>																																			

Cell Phone Modem

To connect a cell phone modem:

Step	Action																																					
1	<p>Find the S1 dipswitches on the MCI card. Change the configuration to Asynchronous RS-232 mode (Channel B), as shown below.</p> <table border="1"> <thead> <tr> <th rowspan="2">Mode</th> <th colspan="8">S1 Dipswitches</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> </tr> </thead> <tbody> <tr> <td>Asynchronous RS-232</td> <td>O</td> <td>I</td> <td colspan="6">Unused</td> <td></td> </tr> <tr> <td>Which way?</td> <td>I</td> <td>I</td> <td colspan="6"></td> <td></td> </tr> </tbody> </table>	Mode	S1 Dipswitches								1	2	3	4	5	6	7	8	Asynchronous RS-232	O	I	Unused							Which way?	I	I							
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	1	2	3	4	5	6	7	8																														
Asynchronous RS-232	O	I	Unused																																			
Which way?	I	I																																				
2	<p>Position the cell phone modem on the MCI card:</p> <ol style="list-style-type: none"> Insert the two standoffs in the holes on the cell phone modem. Connect the xx (side plug) on the cell phone modem to the xx on the MCI card. <p>Need a diagram showing the cell phone modem over the MCI card, pointing out the standoffs and the side plug.</p>																																					
3	<p>Configure the Craft port for the telephone numbers. See the <i>DAD/BAM Application Notes</i> for instructions.</p>																																					
4	<p>Contact your cell phone service company to get your SID and MSD numbers.</p>																																					
5	<p>Connect the antenna inside the OmniRemote:</p> <ol style="list-style-type: none"> Push the SMC connector on the cell phone modem. OR Screw the SMA connector to the cell phone modem. Slide the SMC/SMA connector through the hole in the rear panel of the MCI card. <p>Need a diagram.</p>																																					
6	<p>Replace the OmniRemote's chassis cover. Use a #2 Phillips screwdriver to:</p> <ol style="list-style-type: none"> Re-insert all 10 screws on the top of the chassis cover. Re-insert the bottom three screws on each side of the chassis cover. 																																					
7	<p>Place the OmniRemote back in the mounting rack and screw on the mounting brackets.</p> <p>Note If necessary, refer to "Mounting the OmniRemote" on page 4-7 for detailed instructions.</p>																																					
8	<p>Reconnect all of your communications and power cables.</p> <p>Note If necessary, refer to "Making the External Communication Connections" on page 4-10 for detailed instructions.</p>																																					
9	<p>Connect an antenna cable to the Antenna connector on the rear panel of the MCI card.</p>  <p>Your cell phone modem is now installed.</p>																																					

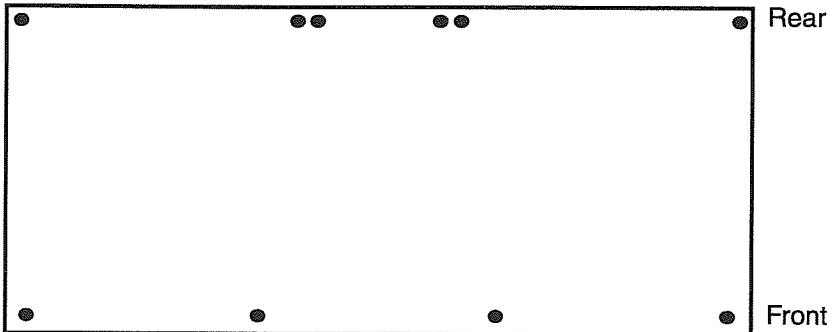
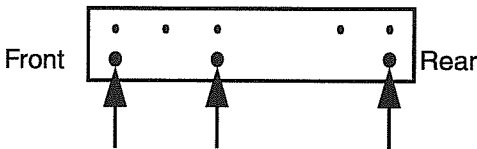
Removing a Modem from the MCI Card

Overview To remove a modem from the MCI card, you must perform the following steps:

- ◆ Remove the chassis cover.
- ◆ Disconnect the modem.

Removing the Chassis Cover

To remove the chassis cover:

Step	Action
1	Make sure all of your external communications and power cables are labeled, then disconnect all of these cables from the OmniRemote. Note You will need a small flathead screwdriver to remove the flathead terminal screws.
2	Unscrew the two mounting brackets from the mounting rack. Remove the OmniRemote from the mounting rack and place it on a workbench.
3	Use a #2 Phillips screwdriver to: a. Remove all 10 screws from the top of the chassis cover.  b. Remove the bottom three screws on each side of the chassis cover. 
4	Remove the chassis cover and set it aside.
5	Continue with "Disconnecting the Modem" on page C-10.

Disconnecting the Modem

Wireline Modem

To disconnect a wireline modem:

Step	Action																																							
1	<p>Remove the wireline modem from the MCI card:</p> <ol style="list-style-type: none"> Disconnect the xx (top plug) on the wireline modem from the xx on the MCI card. Pull the wireline modem off of the two standoffs. <p>Need a diagram showing the wireline modem over the MCI card, pointing out the standoffs and the top plug.</p>																																							
2	<p>Find the S1 dipswitches on the MCI card. Change the configuration to the appropriate mode, as shown below.</p> <table border="1" data-bbox="609 655 1235 819"> <thead> <tr> <th rowspan="2">Mode</th> <th colspan="8">S1 Dipswitches</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> </tr> </thead> <tbody> <tr> <td></td> <td>O</td> <td>I</td> <td colspan="6">Unused</td> <td></td> <td></td> </tr> <tr> <td>Which mode(s)?</td> <td>I</td> <td>I</td> <td colspan="6"></td> <td></td> <td></td> </tr> </tbody> </table>	Mode	S1 Dipswitches								1	2	3	4	5	6	7	8		O	I	Unused								Which mode(s)?	I	I								
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3	<p>Disconnect the Craft port.</p> <p>Need directions for this?</p>																																							
4	<p>Replace the OmniRemote's chassis cover. Use a #2 Phillips screwdriver to:</p> <ol style="list-style-type: none"> Re-insert all 10 screws on the top of the chassis cover. Re-insert the bottom three screws on each side of the chassis cover. 																																							
5	<p>Place the OmniRemote back in the mounting rack and screw on the mounting brackets.</p>																																							
6	<p>Reconnect all of your external communications and power cables, except the telephone line going to the RJ11 connector (Tel) on the rear panel of the MCI card.</p>																																							

Cell Phone Modem

To disconnect a cell phone modem:

Step	Action																															
1	<p>Disconnect the antenna inside the OmniRemote:</p> <ul style="list-style-type: none"> a. Pull the SMC connector off the cell phone modem. OR a. Unscrew the SMA connector from the cell phone modem. b. Remove the SMC/SMA connector through the hole in the rear panel of the MCI card. <p>Need a diagram.</p>																															
2	<p>Remove the cell phone modem from the MCI card:</p> <ul style="list-style-type: none"> a. Disconnect the xx (side plug) on the cell phone modem from the xx on the MCI card. b. Pull the cell phone modem off of the two standoffs. <p>Need a diagram showing the cell phone modem over the MCI card, pointing out the standoffs and the top plug.</p>																															
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6	<p>Place the OmniRemote back in the mounting rack and screw on the mounting brackets.</p>																															
7	<p>Reconnect all of your external communications and power cables, except the antenna cable going to the Antenna connector on the rear panel of the MCI card.</p>																															

Glossary

D

Terms and Definitions

A	Amperage.
AC	Alternating current.
Alarm state	See Off-Normal.
Analog point	An alarm point configured to monitor a changing parameter such as voltage, temperature, counts, etc. Equipped with upper and lower thresholds, an analog point is capable of reporting High, Low, and Normal conditions.
ANSI	American National Standards Institute. A US technology standards organization
Bell 202	An FSK communication standard that specifies the use of voice frequency.
Bistate point	An alarm point configured to monitor two states: one or off. Typical applications include monitoring control relays, TTL outputs, and open collector outputs.
bps	Bits per second. Transmission rate of 1 bit per second.
Channel	Communication facility on which RTUs are installed; used for communication with the RTUs. Channel communication consists of change of state reports, polling, downloading, control operation, and automatic status accumulation.
Channel timeout	A user-set parameter that determines how long the Master will wait for a response from an RTU before proceeding.
Control point	A reference to user-operable relays installed in RTUs.
COS	Change of State. The event which occurs when a monitored point changes between the Normal and Off-Normal states.
CTS	Clear to Send. An RS-232 signal used by a DCE device to indicate it is ready to receive data.
Data structure	The format of transmitted data (e.g., eight data bits, one stop bit, no parity).
DB-9, -15, -25	Standard D-type connector. Typically used for serial digital communication, using 9, 15, or 25 pins.
DC	Direct current.
DCE	Data Circuit-terminating Equipment or Data Communications Equipment. Device at the user end, typically a modem or other communications device, which acts as an access point to the transmission medium.
Domain name	A network name used that is associated with an Internet address.
DS-0	Digital Signal 0. Physical interface for digital transmission at the rate of 64 Kbps. This is the basic voice-grade channels.

DS-1	Digital Signal 1. Physical interface for digital transmission at the rate of 1.544 Mbps. Also known as a T-1 standard, it can simultaneously support 24 DS-0 circuits.
DS-2	Digital Signal 2. Physical interface for digital transmission at the rate of 6.312 Mbps.
DS-3	Digital Signal 3. Physical interface for digital transmission at the rate of 44.736 Mbps.
DSU	Data Service Unit. Equipment at the user end that acts as a telephone-based interface between low-rate (e.g., 56 Kbps) services and higher-rate circuits.
DTE	Data Terminal Equipment. The host computer (PC or workstation) that provides the end user with access to a communications network. The DTE is connected to a DCE, which performs the signaling operation.
DTMF	Dual Tone Multi-Frequency. A signalling method where each key on a keypad generates two audio tones. Also known as Touch-Tone®, a registered trademark of AT&T.
DSR	
DTR	Data Terminal Ready. An RS-232 signal used by a DTE device to indicate it is ready to receive data.
EIA	
Ethernet	A collision detection and avoidance media access method used for LANs.
FTP	File Transfer Protocol. A protocol used for transferring files between different machines across a network.
Gnd	Ground.
Hz	Hertz. A unit of frequency equal to one cycle per second. The measurement unit used to describe the frequency of AC voltage or analog data transmission.
IEEE	Industrial Electronics and Electrical Engineering.
IETF	Internet Engineering Task Force. A body that was initially responsible for developing specifications required for the inter-operable implementation of IP.
I/O	Input/output. used in reference to a data port that handles two-way communication.
IP	Internet Protocol. A networking protocol for providing a connectionless (datagram) service to the higher transport protocol. It is responsible for discovering and maintaining topology information and for routing packets across homogeneous or heterogeneous networks. Combined with TCP, it is commonly known as the TCP/IP platform.
ISDN	Integrated Services Digital Network. An early, ITU-T adopted protocol reference model intended for providing a ubiquitous, end-to-end interactive, digital service for data, audio, and video.
ITU-T	International Telecommunications Union-Telecommunications Standards Sector. A formal, international standards, specifications and recommendations body, formerly known as CCITT. ITU-T is part of the International Telecommunications Union (ITU) founded in 1948 and sponsored by the UN to promote telephone and telegraph issues.
Kbps	Kilo-bits per second. Transmission rate of one-thousand bits per second.
kHz	Kilo-Hertz per second. Analog signalling frequency of one-thousand cycles per second.

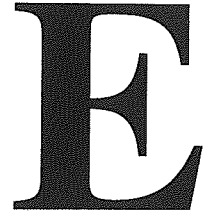
LAN	Local Area Network. A network that interconnects PCs, terminals, workstations, servers, printers, and other peripherals at a high speed over short distances (usually within the same floor or building). Various LAN standards have been developed; Ethernet is the most widely used.
Lower threshold	A user-set parameter applicable to analog points that determines the lower boundary of a point's acceptable, or Normal, measured value.
MAC	Media Access Control. A set of protocols that are the lower part of the Data Link Layer and the basis of the IEEE LAN specifications. Generally, the MAC address uniquely identifies a device with an eight-octet number.
Master	A microprocessor- or computer-controlled system designed for accumulation of alarm and status information from a network of communication devices.
Mbps	Megabits per second. Transmission rate of one-million bits per second.
Network Element	A device that supports a communications network, such as a microwave radio, multiplexer, or fiber transmitter.
NMS	Network Management System.
Normal	The state of a monitored alarm point that reflects normal activity of the monitored device. A transition to this state from Off-Normal might result in a COS report of a relatively low priority, depending on user preference. In many cases, an alarm point is used to monitor a status parameter, where the user does not desire to distinguish between Normal and Off-Normal conditions. Such points are generally configured to report identical priorities when COS events occur.
OAM&P	Operations, Administration, Maintenance, and Provisioning. A set of network management functions and services that interact to provide the necessary network management tools and controls.
OC-n	Optical Carrier-n. ITU-T-specified physical interface for transmission over optical fiber at n times 51.84 Mbps. For example, OC-3 is at 155.52 Mbps.
Off-Normal	The state of a monitored alarm point that usually reflects abnormal, aberrational, or undesirable activity of the monitored device. A transition to this state from Normal should be reported as an Alarm event.
Ohm	A unit electrical resistance.
OSI	Open Systems Interconnection. The OSI Reference Model introduced by the International Organization for Standardization (ISO) consists of seven layers, each specifying the protocols and functions required for two nodes to communicate using the underlying network infrastructure (physical medium, switches, routers, bridges, multiplexors, intermediate nodes).
PBX	Private Branch Exchange. A circuit switch that relays telephones, terminal, or other equipment and provides access to the public telephone system.
Public Network	A communications network where users have shared access to the network resources. Network services are usually provided by common carriers (<i>e.g.</i> , telephone companies).
RJ-11	Registered Jack, 11-pin. The standard modular jack used with a single-line telephone and for asynchronous serial digital communication.
RMA	Returned Materials Authorization. A number given by Badger Technology Customer Service to a customer to include with returned equipment. This number is required before the equipment can be returned.
Routing	A network management function responsible for forwarding packets from their source to their destination. Numerous algorithms exist that satisfy various network topologies and requirements.

RS-232	EIA interface between DTE and Data Communications Equipment employing serial binary data interchange.
RS-422	EIA interface standard that employs balanced-voltage digital interface circuits to provide greater distance and noise immunity characteristics than RS-232.
RTS	
RTU	Remote Terminal Unit. A physical device used to collect alarm and status information for reporting to a Master. Often possesses the capability of operating controls either autonomously or under control of the Master.
RTU address	The physical address of an RTU, often determined by user-set dipswitches with the RTU itself.
RxD	Receive data.
SDH	Synchronous Digital Hierarchy (SONET).
Set time	A user-enabled broadcast of the current time to all RTUs at user-specified intervals. This broadcast synchronizes the internal clocks of all RTUs that are so equipped.
SMTP	Simple Mail Transport Protocol.
SNMP	Simple Network Management Protocol. An IETF-defined standard for handling management information. It is normally found as an application on top of the user datagram protocol.
SONET	Synchronous Optical Network. An ANSI-defined standard for high-speed and high-quality digital optical transmission. It has been recognized as the North American standard for SDH.
STP	Shielded Twisted Pair. Two insulated copper wires twisted together and wrapped by a protective jacket shield.
T1	A TDM digital channel carrier that operates at 1.544 Mbps. Known also as a repeater system, it is often referred to as DS-1.
T3	A TDM digital channel carrier that operates at 44.736 Mbps. It can multiplex 28 T1 signals and is often referred to as DS-3.
TCP	Transmission Control Protocol. A standardized transport protocol developed for interconnecting IP-based networks. Operating on top of IP (collectively known as TCP/IP), it is responsible for multiplexing sessions, error recovery, end-to-end reliable delivery, and flow control.
TCP/IP	A protocol platform, known also as the Internet protocol suite, that combines both TCP and IP. Widely used applications, such as Telnet, FTP, and SMTP interface with TCP/IP.
Telnet	An asynchronous, virtual terminal protocol that allows for remote access.
TxD	Transmit data.
Upper Threshold	A user-set parameter applicable to analog points that determines the upper boundary of a point's acceptable, or Normal, measured value.
UTP	Unshielded Twisted Pair. A twisted pair of copper wires that has no protective sheathing. Used for short-distance wiring (<i>i.e.</i> , building).
V.35	A serial service interface that supports RS-422 synchronous communications. It is typically used with a DSU or channel bank.
Vac	Volt (alternating current).
Vdc	Volt (direct current).
W	Watt. A measure of electrical power.
WAN	Wide Area Network. A network that typically spans nationwide distances and usually uses public telephone circuits.

X.25

One of the first ITU-T standardized public data packet switching network protocols. Originally designed to operate over unreliable communications links, it supported both virtual circuit and datagram services.

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