

# USER MANUAL

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## MODEL IM 1/J Voice/Data Module



**PA PATTON**  
**Electronics Co.**



*An ISO-9001  
Certified Company*

Part# 07MIM1J-A  
Doc# 090111UA  
Revised 10/16/98

SALES OFFICE  
(301) 975-1000  
TECHNICAL SUPPORT  
(301) 975-1007  
<http://www.patton.com>

## 1.0 WARRANTY INFORMATION

**Patton Electronics** warrants all IM1/J components to be free from defects, and will—at our option—repair or replace the product should it fail within one year from the first date of shipment.

This warranty is limited to defects in workmanship or materials, and does not cover customer damage, abuse or unauthorized modification. If this product fails or does not perform as warranted, your sole recourse shall be repair or replacement as described above. Under no condition shall **Patton Electronics** be liable for any damages incurred by the use of this product. These damages include, but are not limited to, the following: lost profits, lost savings and incidental or consequential damages arising from the use of or inability to use this product. **Patton Electronics** specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed an acceptance of these terms by the user.

### 1.1 RADIO AND TV INTERFERENCE

The Model IM1/J generates and uses radio frequency energy, and if not installed and used properly—that is, in strict accordance with the manufacturer's instructions—may cause interference to radio and television reception. The Model IM1/J has been tested and complies with the limits for a Class A computing device in accordance with the specification in Subpart J of Part 15 of FCC rules, that are designed to provide reasonable protection from such interference in a commercial installation. However, this is no guarantee that interference will not occur in a particular installation. If the Model IM1/J does cause interference to radio or television reception, which can be determined by disconnecting the unit, the user is encouraged to try to correct the interference by one or more of the following measures: moving the computing equipment away from the receiver, reorienting the receiving antenna and/or plugging the receiving equipment into a different AC outlet (such that the computing equipment and receiver are on different branches). In the event the user detects intermittent or continuous product malfunction due to nearby high power transmitting radio frequency equipment, the user is strongly advised to use only a shielded twisted pair data cable that is bonded to metalized external outer shield plugs at both ends. The use of a shielded cable satisfies compliance with the Electromagnetic Compatibility (EMC) directive.

### 1.2 CE NOTICE

The CE symbol on your Patton Electronics equipment indicates that it is in compliance with the Electromagnetic Compatibility (EMC) directive and the Low Voltage Directive (LVD) of the Union European (EU). To get a Certificate of Compliance, contact Technical Support.

### 1.3 SERVICE

All warranty and nonwarranty repairs must be returned freight prepaid and insured to Patton Electronics. All returns must have a Return Materials Authorization number on the outside of the shipping container. This number may be obtained from Patton Electronics Technical Service at: **(301) 975-1007**, <http://www.patton.com>; [support@patton.com](mailto:support@patton.com).

**NOTE:** Packages received without an RMA number will not be accepted.

Patton Electronics' technical staff is also available to answer any questions that might arise concerning the installation or use of your Model IM1/J. Technical Service hours: **8AM to 5PM EST, Monday through Friday.**

**WARNING!**  This device is not intended to be connected to the public telephone network.

## 2.0 GENERAL INFORMATION

Thank you for your purchase of this Patton Electronics product. This product has been thoroughly inspected and tested and is warranted for One Year parts and labor. If any questions or problems arise during installation or use of this product, please do not hesitate to contact us at **(301) 975-1007**.

### 2.1 FEATURES

- Adds two Voice Ports and a Synchronous Data Port to Patton's KiloModem Series (Models 1092, 1093, 1094, and 1095)
- Two Loop Start RJ-11 Voice Ports Available as either FXS or FXO
- Synchronous DCE Interface: V.35, RS-232/V.24 or RS-422/530
- Supports Internal Clocking
- Data Rates: 64,192, 320, 448, 704 kbps
- CE and FCC Part 15 Class A Compliant

### 2.2 DESCRIPTION

Patton's new **Voice/Data QuikConnect Module (Model no. IM1/J)** extends the functionality of its KiloModem products by allowing voice, fax and data traffic to be carried over one transmission circuit. The VDQM supports user interfaces for G3 fax, synchronous data and PSTN or compressed voice traffic on one module.

Two RJ11 voice/fax ports support FXS, FXO and G3 fax while using just 64Kbps of bandwidth. Each VDQM also provides a universal data port that is user-configurable for V.35, RS232/V.24 and RS-530 interfaces. Inserted in the KiloModem products, the VDQM combines voice/data/fax traffic onto a typical 2-wire or 4-wire circuit at speeds up to 768kbps with distances up to 17.4 km.

The VDQM is the perfect solution for connecting remote branches or satellite offices which require voice, fax and high-speed data communications. Use a pair of VDQMs to connect a telephone and fax machine in a remote branch office to a PBX in the head office. Serial data traffic shares the same 2-wire interface and flows for free !!!

## 3.0 CONFIGURATION

The Model IM1/J VDQM is equipped with three sets of eight DIP switches, which allow configuration of the unit to a wide variety of applications. This section describes switch locations and explains all possible configurations of the VDQM. Please refer to the appropriate baseband modem (1092, 1093, etc) user manual to configure the baseband modem.

### 3.1 CONFIGURING THE HARDWARE DIP SWITCHES

The 24 external switches are grouped into three eight-switch sets, and are externally accessible from the underside of the VDQM printed circuit board (See Figure 1).

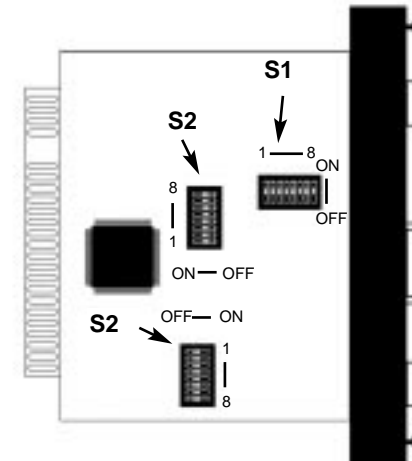


Figure 1. Switches S1, S2, and S3 on the bottom of the VDM

The three sets of DIP switches on the underside of the Model VDQM will be referred to as S1, S2, and S3, as shown above. Figure 2, below, shows the "On" and "Off" positions of each switch.

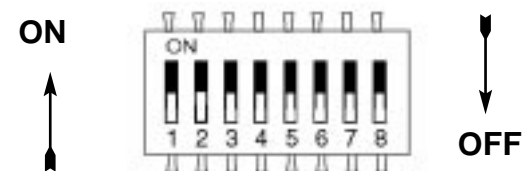


Figure 2. Close Up of Configuration Switches (all sets are identical in appearance)

### 3.2.1 Setting the Electrical Interface (Switches S1 & S2)

In order to make the VDQM work in your application, you must set the electrical interface of the synchronous data port. Applicable electrical interfaces are:

- a) V.35 (default setting)
- b) EIA-232
- c) EIA-422

To set the electrical interface, set Switches S1-1 through S1-8 and Switches S2-1 through S2-6. *Switches S2-7 and S2-8 are reserved for future usage and must remain in the OFF position.* The following table summarizes the VDQM switch settings for each of these interfaces:

Data Port Electrical Interface Summary Table														
Electrical	Switch Settings													
	S1-1	S1-2	S1-3	S1-4	S1-5	S1-6	S1-7	S1-8	S2-1	S2-2	S2-3	S2-4	S2-5	S2-6
V.35*	On	On	On	On	Off	On	On	Off	On	Off	Off	Off	On	On
EIA-232	Off	Off	Off	Off	On	Off	Off	On	Off	On	On	On	On	Off
EIA-422	On	On	On	On	Off	Off	On	Off	Off	Off	Off	Off	Off	Off

\* Default Setting

**NOTE:** All of the above electrical interfaces are implemented on a HD-26 connector). Please refer to Appendix C for the applicable pin assignments.

**NOTE:** Both voice ports must meet the country of installation's requirements for a PSTN interface device, which is typically defined in NET-4. If a country requirement is not defined in NET-4, it is possible to configure the phone interface to meet those country requirements within a month of receiving the specifications and test criteria from that country.

### 3.2.2 Setting the DTE Rate (Switches S3-1 through S3-4)

You must also set the bit rate of the VDQM to match the bit rate of the equipment connected to the DTE port. The following table summarizes the DTE rate settings of the VDQM.

To set the DTE rate, set Switches S3-1 through S3-4 (*Switches S3-5 through S3-8 are reserved for future use and must remain in the OFF position.*)

Data Rate Summary Table				
DTE Rate (kbps)	Switch Settings			
	S3-1	S3-2	S3-3	S3-4
128*	Off	Off	Off	Off
256	On	Off	Off	Off
384	Off	On	Off	Off
512	On	On	Off	Off
640	Off	Off	On	Off
768	On	Off	On	Off
896	Off	On	On	Off
1024	On	On	On	Off
1152	Off	Off	Off	On
1280	On	Off	Off	On
1408	Off	On	Off	On
1536	On	On	Off	On
1664	Off	Off	On	On
1792	On	Off	On	On
1920	Off	On	On	On
2048	On	On	On	On

\* Default Setting

**NOTE:** You must also set the applicable DTE rate on the baseband modem (ie. Model 1092, 1093, etc). Please see the baseband modem user manual for details. The baseband modem and the VDQM must be set for the same DTE rate.

## 4.0 INSTALLATION

This section tells you how to install the VDQM *QuikConnect™* module into the baseband modem, as well as how to connect the voice and the data ports.

### 4.1 INSTALLING THE *QuikConnect™* MODULE

Each *QuikConnect™* Module has a 50-pin card edge connector on one side and an ethernet interface on the other. The instructions below describe how to remove the existing *QuikConnect™* Module and how to install the new IM1/I module. If your base unit does not have an existing *QuikConnect™* already installed, please skip to section 4.1.2.

#### 4.1.1 Removing the Existing *QuikConnect™* Module

- 1) Turn the power switch off. Leave the power cord plugged into a grounded outlet to keep the unit grounded.
- 2) Loosen the two thumbscrews on the module by turning them counterclockwise.
- 3) Grasp the two thumbscrews and gently pull the module from the unit. Apply equal force to the thumbscrews to keep the module straight during the removal process

#### 4.1.2 Installing the New *QuikConnect™* Module

- 1) Make sure the power switch on the base unit is off. Leave the power cord plugged into a grounded outlet to keep the unit grounded.
- 2) Hold the module with the faceplate toward you and align the module with the guide slots in the rear panel of the base unit.
- 3) While keeping the module's faceplate parallel with the base unit rear panel, slide the module straight in—so that the card edge contacts line up with the socket inside the chassis. Figure 3 (below) shows how a *QuikConnect™* Module plugs into the rear of the base unit.

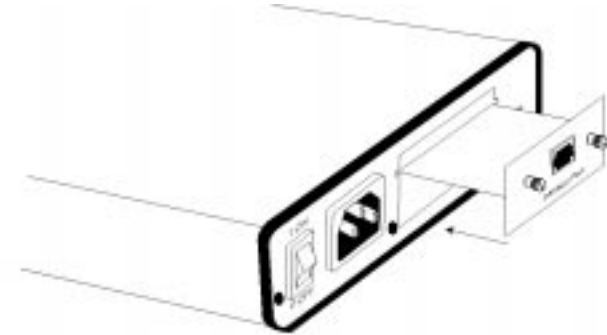


Figure 3. Installing the Model IM 1/J Plug-in Serial Interface Module

- NOTE:** The card edge connector should meet the socket when it is almost all the way into the chassis. If you encounter a lot of resistance, remove the module and repeat steps 2 & 3.
- 4) With the card edge contacts aligned with the socket, firmly seat the module by using your thumbs to apply pressure directly to the right and left edges of the module faceplate. Applying moderate and *even* pressure should be sufficient to seat the module. You should hear it “click” into place.
  - 5) To secure the module in place, push the thumbscrews into the chassis and turn the screws clockwise to tighten.

## 4.2 CONNECTING TO THE VOICE PORTS

Both voice ports utilize a Data Access Arrangement (DAA) to interface with telephone equipment. Both ports also utilize an ADPCM CODEC to convert voice to digital information. The voice ports (V1 and V2) use integral RJ-11 connectors. The FXS and FXO ports look the same on the back of the VDQM *QuikConnect™* Module. Each is shown on the rear of the VDQM module (See Figure 4, below).

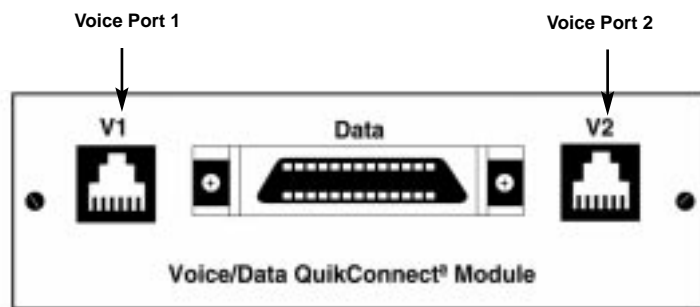


Figure 4. VDM Rear Panel

**Voice Port 1:** Port 1 is permanently defined as a 32Kbs channel conforming to G.721, capable of supporting normal speech and Fax transmissions up to 14.4Kbs.

**Voice Port 2:** Port 2 is permanently defined as a 24Kbs channel conforming to G.723, intended for voice transmission only.

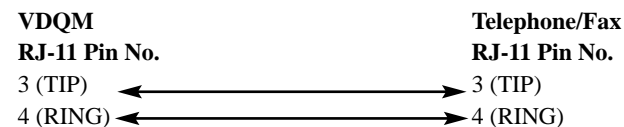
### 4.2.1 Identifying FXS/FXO Voice Modules

The VDQM is factory defined as a FXO (Foreign Exchange Service) or FXO (Foreign Exchange Office) on both voice ports at the factory. To determine the factory configuration of your VDQM, look at the label on the inside of the rear panel. You will see one of the following Model number codes, plus a serial number.

<b>Model IM1/JS</b>	-	FXS Voice Ports
<b>Model IM1/JO</b>	-	FXO Voice Ports

### 4.2.2 Connecting to an FXS Voice Port (Model IM1/JS)

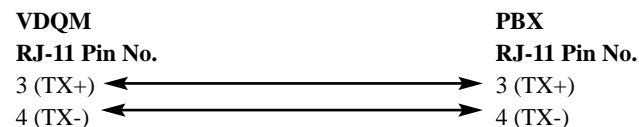
The FXS (looks like central office) ports are designed as a loop start telephone interfaces. Each is designed to connect to a telephone or fax machine using a two-wire interface (as shown below).



**Warning!** Connecting the FXS port of the VDM to a telephone line WILL damage the VDM and possibly the telephone line. ONLY connect telephones or fax machines (or similar equipment) to the FXS port.

### 4.2.3 Connecting to an FXO Voice Port (Model IM1/JO)

The FXO (looks like telephone) ports are designed as loop start telephone interfaces. Each is designed to connect to a PBX using a two-wire interface (as shown below).



**NOTE!** The FXO ports are designed to be connected to a PBX (or similar equipment). If you wish to connect the FXS ports directly to PSTN, you MUST obtain approval from the PTT.

## 5.0 OPERATION

### 4.3 CONNECTING TO THE DATA PORT

The VDQM universal interface data interface is configured as DCE (Data Circuit-Terminating Equipment). It may be configured to transmit/receive V.35, EIA-232 or EIA-422 electrical signals by appropriately setting switches S1 and S2 (See Section 3.2).

As a DCE, the High Density 26 pin data port is designed to connect directly to DTE (Data Termination Equipment), such as a router. Refer to the pin assignments in **Appendix C** to construct a cable to connect your DTE or DCE equipment. You may also purchase a connecting cable directly from cable from Patton Electronics.

### 4.4 CONNECTING TO AC OR DC POWER

Instructions for connecting the power supply (**Universal Interface AC Power Supply** and **DC Power Supply** option) are contained within the base unit user manual. Please refer to the base unit manual for connection details.

Once the VDQM is installed, it should operate transparently. This section describes FXS and FXO power-up, and general operating instructions.

### 5.1 GENERAL OPERATING INSTRUCTIONS

Both voice ports utilize a Data Access Arrangement (DAA) to interface with the telephone line. Both ports also utilize an ADPCM CODEC to convert the voice to digital information.

The FXS configuration (Model IM1/JS) has the capability to generate battery voltage and ring signal. The battery voltage in the "On-Hook" condition will be 47 V +/- 10%. In the "Off-Hook" condition the circuit will supply the required current which meets the country of installation's V/I curve in accordance with NET- 4.

The ring signal has the capability to drive a 1 REN load. This capability will typically allow for one phone and an extension to be connected on a single port or to a single phone with a line length up to 1700 feet since most phones have a REN less than 1. This will allow the unit to be placed in a phone closet if desired, as opposed to sitting on a desk.

Dialing from an FXS port to an FXO port is accomplished via the voice channel. DTMF digits generated by the phone connected to an FXS port are transmitted to the FXO port. Dial Pulse dialing is not permitted. Dialing between two FXS ports is not required.

## 5.2 OPERATING THE SYNCHRONOUS DATA PORT

The synchronous data port is a variable rate Universal DCE port. Since both voice ports and framing/signaling information require 64Kbs, the remaining bandwidth is used for the data port.

The physical interface of the Data Port is a female, High Density DB-26. The electrical interface is user configured as a V.35, EIA-232, or EIA-422. The configuration is accomplished via dip switches on the module. At present, the design uses a "gapped" clock approach. The clock sent from the module to the DTE terminal is halted during voice and framing transmission. With the gapped clock approach, the clock period of the host module is the period of the DCE clock. The effective data rate at the DCE port is the host data rate minus 64Kbs.

## 5.3 FXS to FXO APPLICATIONS:

Figure 5 depicts a typical FXO to FXS application. A Model 1092 with an FXS VDQM acts as an extension of two PSTN phone lines, which is connected to the 1092 with an FXO VDQM. In this example, calls dialed into 555-1111 will automatically be sent to the fax machine connected to Port 1 of Unit 2. When the handset of the phone connected to Port 2 of Unit 2 is lifted, the phone line of Port 2 Unit 1 will go off hook, passing dial tone and allowing for DTMF dialing. A router connected to the Data port of Unit 2 can control the modem connected to the data port of Unit 1.

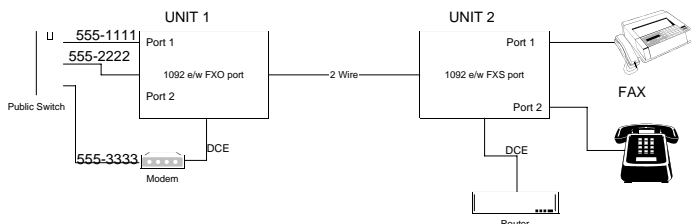


Figure 5. Typical FXS to FXO Application

## 5.4 FXS to FXS APPLICATIONS:

Figure 6 depicts a typical FXS to FXS application. The fax machine connected to Port 1 on Unit 1 will communicate with the FAX machine connected to Port 1, Unit 2. Phone numbers are not required for the FXS modules but may be required for the fax machine to operate properly. If a fax is to be sent from Unit 1 to Unit 2, a 'dummy' digit can be entered into FAX 1 (**NOTE:** the fax machines must be set to ignore dial tone). When the FAX 1 is given the send command, Port 1 unit 1 will go off-hook. The IM1/J will then send signaling bits to Unit 2, instructing Unit 2 Port 1 to ring. Fax 2 will answer the ring and normal Fax traffic will commence.

To initiate a voice call, either phone is picked up, the phone at the far end will ring. Once the phone at the far end is answered, both units will go into voice mode and a conversation can be held.

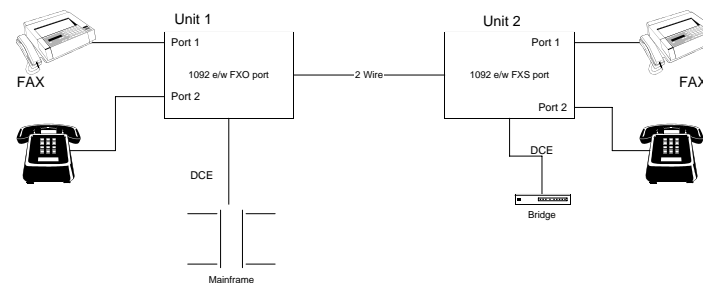


Figure 6. Typical FXS to FXO Application



**APPENDIX A**

**PATTON ELECTRONICS MODEL IM1/J  
SPECIFICATIONS**

<b>Description</b>	Extended ( 0.5") "Quick Connect" module capable of providing a synchronous universal DCE data port and two loop start voice ports, either FXS or FXO.
<b>Host</b>	Patton Models 1090, 1092, 1092A, 1093, 1094, and 1095.
<b>Signaling</b>	In-Band proprietary coding across the host digital link.
<b>Data Format</b>	Synchronous
<b>Data Rate</b>	64, 192, 320, 448, 704, kbps utilizing a 'gapped' clock approach.
<b>Indicators</b>	None
<b>Clocking Options</b>	Internal
<b>Diagnostics:</b>	None
<b>DTE Interface:</b>	EIA-232, EIA-422 or ITU V.35
<b>Connection:</b>	DCE port: HDDB 26 female 2 Voice ports: RJ-11.
<b>Isolation</b>	Voice ports: 1500 VRMS, FCC Part 68
<b>Surge Protection:</b>	Voice Ports: Tip & Ring protected by 320 V sidactor.
<b>Power Requirements:</b>	+5V @ 1 Amp
<b>Compliance:</b>	EN 55022(CE), EN 60950, FCC Part15 Class A,
<b>Control:</b>	Dipswitch Setup

**APPENDIX B**

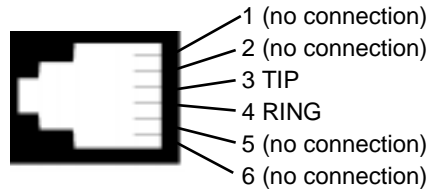
**PATTON ELECTRONICS MODEL IM1/J  
FACTORY REPLACEMENT PARTS  
AND ACCESSORIES**

<u>Patton Electronics Model #</u>	<u>Description</u>
IM1/A.....	V.24 with DB25F
IM1/B.....	RS422/RS530 with DB25F
IM1/C.....	V.35 with M34F
IM1/D.....	X.21 with DB15F
IM1/E.....	V.35 with DB25F
IM1/F.....	G.703 with RJ45
IM1/I.....	Ethernet Bridge Module
IM1/J.....	Voice/Data Module
0805US.....	American Power Cord
0805EUR.....	European Power Cord CEE 7
0805UK.....	United Kingdom Power Cord
0805AUS.....	Australia/New Zealand Power Cord
0805DEN.....	Denmark Power Cord
0805FR.....	France/Belgium Power Cord
0805IN.....	India Power Cord
0805IS.....	Israel Power Cord
0805JAP.....	Japan Power Cord
0805SW.....	Switzerland Power Cord
07M1090SVC.....	1090 Series Service Manual

**APPENDIX C**

**PATTON ELECTRONICS MODEL IM1/J  
INTERFACE PIN ASSIGNMENT**

**V1 & V2 Voice Ports  
(RJ-11 Female Connector)**



**APPENDIX C**

**PATTON ELECTRONICS MODEL IM1/J  
INTERFACE PIN ASSIGNMENT**

**EIA-232, EIA-422 Interface Pin Description  
(UD-26 Female Connector)  
(DCE Configuration)**

