USER MANUAL

MODEL 1092A

High Speed, 2-Wire/4-Wire, Sync & Async Short Range Modem

PATTON Electronics Co.

ISO 9001

An ISO-9001 Certified Company

Part# 07M1092A-E
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1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 1092A 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 1092A 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 1092A has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection from such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. If the Model 1092A 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, re-orienting 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).

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 European Union (EU). A Certificate of Compliance is available by contacting Technical Support.

1.3 SERVICE

All warranty and non-warranty 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:

tel: **(301)975-1007**;
email: **support@patton.com**; or,
www: **http://www.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 1092A. Technical Service hours: **8AM to 5PM EST, Monday through Friday.**

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 Patton Electronics Technical Support at (301) 975-1007.

2.1 FEATURES

- Synchronous data rates: 19.2, 32, 56, 64 and 128 kbps in all clock modes
- Asynchronous data rates: 0 - 38.4 kbps
- Full duplex operation over a one or two twisted pair (2- or 4-Wires)
- Point-to-point distances up to 11 miles (17.6Km)
- Remote digital loopback, local line loopback diagnostics
- Internal, external or receive recovered clocking options
- LED indicators for TD, RD, CTS, CD, DTR, TM, ER and NS
- Standard Gas Tube Surge Protection
- Made in the U.S.A.

2.2 DESCRIPTION

The Patton Electronics Model 1092A *KiloModem 2W/4W*™ baseband modem allows synchronous or asynchronous data transmissions up to 11 miles (17.6 km) over one or two twisted pair (2 or 4 Wire). Supporting synchronous speeds up to 128 kbps and asynchronous speeds up to 38.4 kbps, the 1092A widens the bottleneck for high speed LAN interconnection or high speed internet links.

The Model 1092A is remotely manageable when connected to a rack-mounted Model 1092ARC and using a Model 1001MC Management Card. Perfect for synchronous tail-circuit applications, the Model 1092A supports internal, external or receive loopback synchronous clocking. Data rates and asynchronous data format may be configured locally using DIP switches.

The Model 1092A features replaceable DCE-DTE interface modules. Available interfaces include V.24/RS-232, V.35, RS-422/530, G.703, X.21, and 10BaseT Ethernet. Line connection is made by RJ-45C jack. The standard Model 1092A is powered by a 100/230VAC(Universal) supply. The internal DC power supply option supports any DC input between 40-60VDC.

2.3 1092A SNMP MANAGEMENT SOLUTIONS

Model 1092A is **SNMP manageable** when it is connected to a rack-mounted Model 1092ARC . SNMP management is enabled through a 1001MC rack management card located in the Patton Electronics Rack System.

2.3.1 HTTP/HTML Management

The 1001MC maintains HTML pages that can be viewed through a web browser. You can display remote statistics and configure Model 1092A parameters simply by entering the 1001MC's IP address into the browser

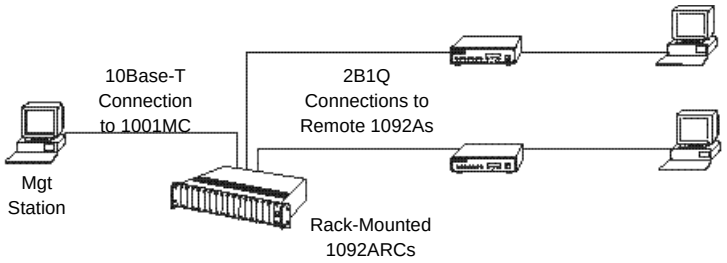

Figure 1. Typical Application of the 1092A

3.0 CONFIGURATION

The Model 1092A is equipped with two 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.

3.1 CONFIGURING THE HARDWARE DIP SWITCHES

The Model 1092A uses a unique set of 16 external mini DIP switches that allow configuration to a wide range of applications. The 16 external switches are grouped into two eight-switch sets, and are externally accessible from the underside of the Model 1092A (See Figure 2).

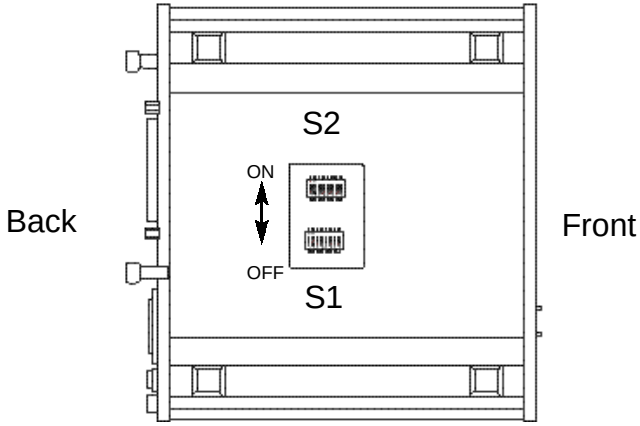

Figure 2. Underside of Model 1092A, Showing Location of DIP Switches

The two sets of DIP switches on the underside of the Model 1092A will be referred to as S1 and S2. As Figure 3 shows the orientation of all DIP switches is the same with respect to "ON" and "OFF" positions.

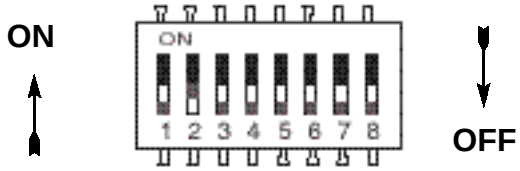

Figure 3. Close Up of Configuration Switches (both sets are identical in appearance)

3.1.1 Configuration DIP Switch Set "S1"

Use the eight switches in DIP Switch Set "S1" to configure the data rate, asynchronous or synchronous data format, transmit clock source and response to RDL request. The following table summarizes default positions of DIP Switch S1. Detailed descriptions of each switch follow the table.

S1 SUMMARY TABLE		
Position	**Function**	**Factory Default**
S1-1	Data Rate	On } 64K Sync
S1-2	Data Rate	Off }
S1-3	DSR during Local Line Loop	On DSR On
S1-4	SNMP Management	Off VT100 Mgmt
S1-5	Reserved	Off
S1-6	Tx Clock Source	On } Internal Clock
S1-7	Tx Clock Source	On }
S1-8	Response to RDL Request	On Enable

Switches S1-1 and S1-2: Data Rate

Use Switches S1-1 and S1-2 **with Switch S2-1** to configure the Async or Sync bit rate for Model 1092A. The following table summarizes default positions of DIP Switch S2. Detailed descriptions of each switch follow the table.

Possible Bit Rate Settings - Switch S1-1, S1-2 and S2-1				
S1-1	**S1-2**	**S2-1**	**Sync Data Rate**	**Async Data Rate**
On	On	Off	32 kbps	Reserved
Off	On	Off	56 kbps	Reserved
On	Off	Off	64 kbps	Reserved
Off	Off	Off	128 kbps	0-38.4 kbps
On	ON	On	Reserved	Reserved
Off	On	On	Reserved	Reserved
On	Off	On	Reserved	Reserved
Off	Off	On	19.2 kbps	Reserved

Switch S1-3: Data Set Ready During Line Loopback Test

Use Switch S1-3 to control the behavior of the DSR signal at the EIA interface during the line loopback test.

S-3	Setting
On	DSR is on during local line loop
Off	DSR is off during local line loop

Switches S1-4: Management Setting

When setting the 1092A to SNMP Management, the DTE rate switches (S1-1, S1-2, and S2-1) are also needed to be at the ON position. Therefore, to set a 1092A unit SNMP management mode, the following switches have to be at the ON position, S1-1, S1-2, S2-1, and S1-4.

Use Switch S1-4 to configure the 1092A's management setting.

S1-4	Setting
On	SNMP Management
Off	Control Port Management

Switches S1-5: Reserved

Always at off position

Switches S1-6 and S1-7: System Clock Mode

Use Switches S1-6 and S1-7 to configure the 1092A for internal, external, or receive recover clock mode.

S1-6	S1-7	Clock Mode	Description
On	On	Internal	System clock generated internally
Off	On	External (DTE)	System clock derived from terminal interface
On	Off	Receive Recover	System clock derived from the received line signal.
Off	Off	Hardware Reset	Reset to use hardware switches for configuration

Switch S1-8: Response to RDL Request

Use Switch S1-8 to allow Model 1092A to enter the Remote Digital Loopback diagnostic test when requested to do so by the far end Model 1092A For example, when Switch S1-8 is set to "ON", it will enter RDL mode (See Section 5.3.2) when requested to do so by the remote Model 1092A.

S1-8	Setting
On	Response to RDL Request Enabled
Off	Response to RDL Request Disabled

3.1.2 Configuration DIP Switch Set "S2"

Use the DIP Switches in Switch S2 to enable 19.2 kbps synchronous operation, 2-Wire/4-Wire configuration and loopback modes from DTE . The following table summarizes default positions of DIP Switch S2. Detailed descriptions of each switch follow the table.

S2 SUMMARY TABLE

Position	Function	Factory Default	
S2-1	Data Rate	Off	
S2-2	Front Panel Switch Enable	Off	Enable
S2-3	Response to LAL from DTE	Off	Disabled
S2-4	2-Wire/4-Wire	Off	2-Wire
S2-5	Not Assigned	Off	
S2-6	Response to RDL from DTE	On	Enabled
S2-7	Not Assigned	Off	
S2-8	Not Assigned	Off	

Switch S2-1: Data Rate

Use Switch S2-1 with Switches S1-1 and S1-2 to enable additional data rates. The Table in Section 3.1.1 shows all possible bit rate settings for Switches S1-1, S1-2, and S2-1.

Switch S2-2: Front Panel Switch Enable

Use Switch S2-2 to enable or disable the front panel toggle switches.

S2-2	Setting
On	Disable the Front Panel Switches
Off	Enable the Front Panel Switches

Switch S2-3: Response to Local Line Loop Requests from DTE

Use Switch S2-3 to enable Local Line Loopback control from the local DTE interface (See Section 5.3.1).

S2-3	Activation	Description
Off	Disabled	Ignore Local Line Loop Back request from DTE interface
On	Enabled	Respond to Line Loop Back request from DTE interface

Switch S2-4: 2-Wire/4-Wire

Use Switch S2-4 to configure 2-Wire or 4-Wire twisted pair operation.

S2-4	Setting	Description
Off	2-Wire	2-Wire Operation
On	4-Wire	4-Wire Operation

Switch S2-5: Not Assigned

Switch S2-6: Response to RDL Request from DTE

Use Switch S2-6 to enable RDL control from the local DTE. In the enabled setting, the 1092A responds to RDL requests from the local DTE by sending an RDL loop request to the remote Model 1092A (See Section 5.3.2).

S2-3	Activation	Description
Off	Disabled	Ignore Remote Digital Loopback request from DTE interface
On	Enabled	Respond to Remote Digital Loop Back request from DTE interface

Switches S2-7 and S2-8: Not Assigned

3.2 CONFIGURING THE SOFTWARE SWITCHES

The Model 1092A features a menu-driven command system that allows you to configure the local 1092A. Follow the instructions below to configure the Model 1092A using the software switches:

1) Connect the serial RS-232 port of a V100 or similar DTE with terminal emulation to the EIA/TIA-561l port of the Model 1092A. To construct an RS-232 to EIA-561 patch cable, refer to the control port pinout diagram in Appendix D.

2) Power up the terminal and set its RS-232 port as follows:

   9600 Baud
   8 data bits, 1 stop bit, no parity
   Local echo
   CR-CR/LF on inbound data
   ANSI, VT-100 emulation

3) Power up the Model 1092A.

4) After the Model 1092A is powered on, the control port will send out this message:

Model: 1092A Software version: x.xx
Patton Electronics Copyright (C) 2000

5) Press [ESC] on the terminal.

6) The 1092A will then display the MAIN MENU screen. You may configure the LOCAL Model 1092A from this screen.

> ***Important!!:*** To make a selection from any menu, enter the option number. To exit any menu without making a selection, or to return to the previous menu, press the [ESC] key.

3.2.1 Configuring the Local 1092A

To configure the local 1092A, make a selection from the following MAIN MENU.

```
*********************************************
*              MAIN MENU                    *
*                                           *
* 1. Display Active Configuration           *
* 2. Display Hardware Configuration         *
* 3. Display Software Configuration         *
* 4. Setup Software Configuration           *
* 5. Select Hardware/Software Control       *
* 6. Display Modem Status                   *
* 7. Test Modes                             *
*********************************************
Enter your selection<1-7>>
```

MAIN MENU Option 1: Display Active Configuration

Select Option 1 to display the most recent configuration of the local Model 1092A (See below). The Model 1092A uses the active configuration for its operation. If you make changes to the configuration, you must select MAIN MENU Option 8. This will update the unit to the new active configuration.

```
*********************************************************
*     ACTIVE CONFIGURATION - Esc to MAIN MENU           *
*                                                       *
* Configuration Control:              Hardware          *
* DTE Rate:                           64 Kbps           *
* Data Format:                        Synchronous       *
* Clock Mode:                         Internal          *
* DSR during Local Line Loop:         Enabled           *
* Response to Remote Digital Loop:    Enabled           *
* DTE controlled Local Line Loop:     Disabled          *
* DTE controlled Remote Digital Loop: Disabled          *
*********************************************************
```

MAIN MENU Option 2: Display Hardware Configuration

Select Option 2 to display the configuration of the hardware DIP-switches. To use the Hardware Configuration for the Active Configuration, select MAIN MENU Option 5. Then select “Use Hardware DIP-Switches”. Finally, select MAIN MENU Option 8 to save the changes.

```
**********************************************************
*     HARDWARE CONFIGURATION - Esc to MAIN MENU         *
*                                                       *
* Configuration Control:              Hardware          *
* DTE Rate:                           64 Kbps           *
* Data Format:                        Synchronous       *
* Clock Mode:                         Internal          *
* DSR during Local Line Loop:         Enabled           *
* Response to Remote Digital Loop:    Enabled           *
* DTE controlled Local Line Loop:     Disabled          *
* DTE controlled Remote Digital Loop: Disabled          *
**********************************************************
```

MAIN MENU Option 3: Display Software Configuration

Select Option 3 to display the configuration of the software switches. To use the software configuration for the Active Configuration, select MAIN MENU, Option 5. Then select “Use Software Switches”. Finally, select MAIN MENU Option 8 to save the changes.

```
**********************************************************
*   SOFTWARE CONFIGURATION - Esc to MAIN MENU            *
*                                                       *
* Configuration Control:              Hardware          *
* DTE Rate:                           64 Kbps           *
* Data Format:                        Synchronous       *
* Clock Mode:                         Internal          *
* DSR during Local Line Loop:         Enabled           *
* Response to Remote Digital Loop:    Enabled           *
* DTE controlled Local Line Loop:     Disabled          *
* DTE controlled Remote Digital Loop: Disabled          *
**********************************************************
```


MAIN MENU Option 4: Setup Software Configuration

Select Option 4 to edit the software configuration of the Model 1092A. To save changes after editing the software configuration, select MAIN MENU Option 5, then select “Use Software Switches” and then select MAIN MENU Option 8.

```
******************************************************
* SOFTWARE CONFIGURATION MENU - Esc to MAIN MENU      *
*                                                    *
* 1. DTE Rate                                        *
* 2. Data Format (Async/Sync)                        *
* 3. Clock Mode                                      *
* 4. DSR during Local Line Loop                      *
* 5. Response to Remote Digital Loop                 *
* 6. DTE controlled Local Line Loop                  *
* 7. DTE controlled Digital Loop                     *
* 8. 4-Wire/2-Wire selection                         *
*                                                    *
******************************************************
Enter your selection (1-7)>
```

1. DTE Rate

Select Option 1 in the SOFTWARE CONFIGURATION menu to select the async. or sync. DTE Rate of the Model 1092A. The selections are shown below.

```
**************************************************
* DTE RATE - Esc to SOFTWARE CONFIG MENU         *
*                                                *
* 1. 32 Kbps          3. 64 Kbps (Default)       *
* 2. 56 Kbps          4. 128 Kbps                *
**************************************************
Enter your selection(1-4)>
```

2. Data Format

Select Option 2 in the SOFTWARE CONFIGURATION Menu to select the async or sync data format (See below).

```
*************************************************
* DATA FORMAT - Esc to SOFTWARE CONFIG MENU     *
*                                               *
* 1. Asynchronous, 8 bits + no parity           *
* 2. Asynchronous, 7 bits + parity              *
* 3. Asynchronous, 7 bits, no parity            *
* 4. Synchronous                                *
*************************************************
Enter your selection(1-4)>
```

3. Clock Mode

Select Option 3 in the SOFTWARE CONFIGURATION Menu to select the sync clock mode (See below).

```
*************************************************
* CLOCK MODE - Esc to SOFTWARE CONFIG MENU      *
*                                               *
* 1. Master Clock - Internal (default)          *
* 2. Master Clock - External (DTE provided)     *
* 3. Slaved to Receive Clock                    *
*************************************************
Enter your selection(1-3)>
```

Set this option as follows:

Master Clock - Internal: Selection 1 allows the Model 1092A to generate an internal clock as the timing source.

Master Clock - External: Selection 2 allows the Model 1092A to Derive the system clock from the locally connected DTE.

Slaved to Receive Clock: Selection 3 to allows the Model 1092A to derive the timing source from the incoming data stream from the remote Model 1092A.

Important: One 1092A must be a Master Clock (either internal or external) and the other must be Slaved to the Receive Clock.

4. DSR During Local Line Loop

Select Option 4 in the SOFTWARE CONFIGURATION to configure the behavior of the local Data Set Ready (DSR) signal during the Local Line Loop test mode (below).

```
*************************************************
*         DSR DURING LOCAL LINE LOOP            *
*         Esc to SOFTWARE CONFIG MENU           *
*                                               *
* 1. DSR ON during Local Line Loop (default)    *
* 2. DSR OFF during Local Line Loop             *
*************************************************
Enter your selection(1-2)>
```

5. Response to Remote Digital Loop

Select Option 5 in the SOFTWARE CONFIGURATION Menu to instruct the Model 1092A to either respond or ignore the Remote Digital Loop request from the remote 1092A.

```
*********************************************
*  RESPONSE TO REMOTE DIGITAL LOOP          *
*    Esc to SOFTWARE CONFIG MENU            *
*                                           *
* 1. ENABLE (default)     2. DISABLE        *
*********************************************
Enter your selection(1-2)>
```

6. DTE Controlled Local Line Loop

Select Option 6 in the SOFTWARE CONFIGURATION Menu to instruct the Model 1092A to either respond or ignore Local Line Loop requests from the DTE. To instruct the Model 1092A to respond to Local Line Loop requests from the DTE, select Enable (Option 1). To instruct the 1092A to ignore Local Line Loop requests from the DTE interface, select Disable (Option 2).

```
*********************************************
*   DTE CONTROLLED LOCAL LINE LOOP          *
*    Esc to SOFTWARE CONFIG MENU            *
*                                           *
* 1. ENABLE (default)     2. DISABLE        *
*********************************************
Enter your selection(1-2)>
```

7. DTE Controlled Remote Digital Loop

Select Option 7 in the Menu to enable DTE control of the Remote Digital Loop Menu (See below). The interface by selecting Enable (Option 1). To instruct the 1092A to ignore this request from the DTE interface, select Disable (Option 2).

```
*********************************************
* DTE CONTROLLED REMOTE DIGITAL LOOP *
*    Esc to SOFTWARE CONFIG MENU     *
*                                    *
* 1. ENABLE (default)     2. DISABLE *
*********************************************
Enter your selection(1-2)>
```

Select Option 8 in the SOFTWARE CONFIGURATION configure 2-Wire or 4-Wire operation.

```
*****************************************************
*      2-Wire/4-Wire Selection                      *
*       1. 4-Wire Mode                              *
*       2. 2-Wire Mode                              *
*                                                   *
*****************************************************
```

MAIN MENU Option 5: Select Hardware/Software Control

MAIN MENU selects whether the Model settings for its active configuration. If Options 1 or 2 are selected, the 1092A will use the current hardware or software switch settings as the Option 8 to implement the changes.

```
*****************************************************
*   HARDWARE/SOFTWARE CONFIGURATION CONTROL   *
*              Esc to MAIN MENU               *
*                                             *
* 1. Use Hardware Dip-switches (default)      *
* 2. Use Software Switches                    *
*****************************************************
Enter your selection(1-2)>
```

MAIN MENU Option 6: Display Modem Status

Select Option 6 from MAIN MENU to display the Modem Status (below). Press the space bar on the keyboard to update and redisplay the screen.

```
*************************************************************
*            MODEM STATUS - Esc to MAIN MENU                *
*                                                           *
* Handshake status:    HANDSHAKING                          *
* Data Terminal Ready: OFF                                  *
* Request To Send:     OFF                                  *
* Carrier Detect:      OFF                                  *
* Data Set Ready:      OFF                                  *
* Clear To Send:       OFF                                  *
* Test Mode:           OFF                                  *
*************************************************************
```

NOTE: Valid Model 1092A Handshake Statuses are listed below:

1) Handshaking - This status occurs when the 1092A is in the process of establishing a link with another 1092A.

2) Data Mode - This status occurs when the 1092A successfully establishes a link with another 1092A allowing the data to flow.

MAIN MENU Option 7: Test Modes

Select Option 7 from the MAIN MENU to select the test mode status of the Model 1092A. (below). The Model 1092A Test Mode settings help to verify the integrity of the data link and isolate communication difficulties.

```
*************************************************************
*    TEST MODE MENU - Esc to MAIN MENU      *
*                                           *
* 1. OFF                                    *
* 2. 511                                    *
* 3. 511 w/errors                           *
* 4. Local Line Loop                        *
* 5. Local Line Loop and 511                *
* 6. Local Line Loop and 511 w/errors       *
* 7. Remote Digital Loop                    *
* 8. Remote Digital Loop and 511            *
* 9. Remote Digital Loop and 511 w/errors   *
*************************************************************
Enter your selection(1-9)>
```

NOTE: Test Mode options 2,3,7,8 and 9 require the 1092A to be in Data Mode with the remote 1092A.

The Model 1092A Test Modes are described on the following page.

To run or terminate a particular test, key in the option to get to that screen menu.

OFF	Terminates all tests
511	Initiates the built-in test pattern generator and detector.
511 with Errors	Initiates the built-in test pattern generator and detector. The test pattern generator also injects intentional errors approximately once per second.
Local Line Loop and 511	Initiates the Local Line Loop test and starts the internal 511 generator and detector.
Local Line Loop and 511 w/errors	Initiates the Local Line Loop test and starts the internal 511 generator and detector. In this test, the 511 pattern generator injects intentional errors into the data stream.
Remote Digital Loop	Initiates the Remote Digital Loopback test. Any data sent to the remote 1092A is returned to the originating device.
Remote Digital Loop and 511	Initiates the Remote Digital Loopback test and starts the internal 511 generator and detectors.
Remote Digital Loop and 511 with errors	Initiates the Remote Digital Loopback test and starts the 511test patterns. In this test the 511 pattern generator will inject initial errors into the data stream.

The Modem Status Screen is displayed upon initiating a test. Press 'ESC' to return to the Test Mode Menu.

Press the space bar to update and redisplay the status.

4.0 INSTALLATION

Once the Model 1092A is properly configured, it is ready to connect to the twisted pair interface, to the serial port, and to the power source. This section tells you how to make these connections.

4.1 CONNECTING THE TWISTED PAIR INTERFACE

The Model 1092A supports communication between two DTE devices at distances to 5 miles (8 km) over 24AWG (.5mm) twisted pair wire. There are two essential requirements for installing the Model 1092:

1. These units work in ***pairs***. Both units at the end of the twisted pair must have the same 2-Wire or 4-Wire setting. For instance, if the application is a 2-Wire application, then both units must be in the 2-Wire setting.

2. To function properly, the Model 1092A needs one or two **twisted** pairs of metallic wire. This twisted pair must be ***unconditioned***, dry, metallic wire, between 19 (.9mm) and 26 AWG (.4mm) (the higher number gauges may limit distance somewhat). Standard dial-up telephone circuits, or leased circuits that run through signal equalization equipment, or standard, flat modular telephone type cable, are *not acceptable*.

The RJ-45 connector on the Model 1092A's twisted pair interface is polarity insensitive and is wired for a two-wire or four-wire interface. The signal/pin relationships are shown in Figure 4 below.

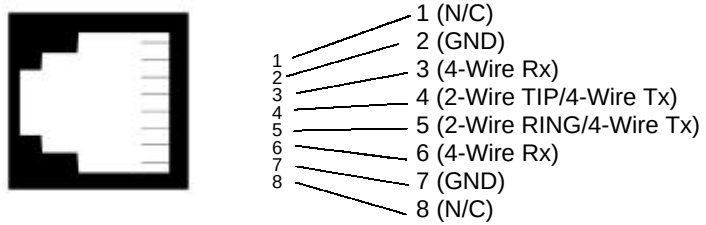

Figure 4. Model 1092A twisted pair line interface.

3. **Proper <u>2-Wire</u> Pairing** between the two modems is as follows:

SIGNAL	PIN#		PIN#	SIGNAL
TIP	4	----------	4	TIP
RING	5	----------	5	RING

4. **Proper <u>4-Wire</u> Pairing** between the two modems is as follows:

SIGNAL	PIN#		PIN#	SIGNAL
Tx	4	----------	3	Rx
Tx	5	----------	6	Rx
Rx	3	----------	4	Tx
Rx	6	----------	5	Tx

4.2 CONNECTING THE SERIAL PORT

The serial port interface on the Model 1092A uses interchangeable *QuikConnect*™ Modules. Each *QuikConnect*™ Module has a 50-pin card edge connector on one side and a serial port interface on the other. Figure 5 below shows how a *QuikConnect*™ Module plugs into the back of the Model 1092A.

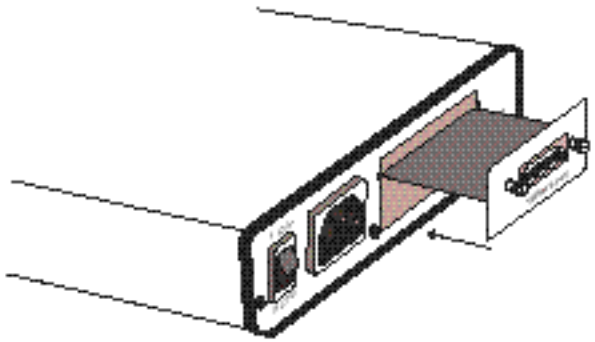

Figure 5. Installation of Model 1092A Plug-in Serial Interface Module

4.2.1 Changing *QuikConnect*™ Modules

When you purchase a particular version of the Model 1092A, it should be shipped to you with the appropriate *QuikConnect*™ Module already installed. If you need to install a different *QuikConnect*™ Module, follow these steps:

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

Installing the New *QuikConnect*™ Module

1) Make sure the power switch 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 Model 1092A.

3) While keeping the module's faceplate parallel with the Model 1092A rear panel, slide the module straight in – so that the card edge contacts line up with the socket inside the chassis.

   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.

4.2.2 Connecting to a "DTE" Device

The serial port on most *QuikConnect*™ interface modules (all except the X.21 module) is hard-wired as a DCE. Therefore these modules "want" to plug into a DTE such as a terminal, PC or host. When making the connection to your DTE device, use a **straight through** cable of the shortest possible length—we recommend 6 feet or less. When purchasing or constructing an interface cable, please refer to the pin diagrams in **Appendix C** as a guide.

4.2.3 Connecting to a "DCE" Device

If the Model 1092A's QuikConnect™ interface module is hard-wired as a DCE (all except the X.21 module), you must use a *null modem* cable when connecting to a modem, multiplexer or other DCE device. This cable should be of the shortest possible length—we recommend 6 feet or less. When purchasing or constructing a null modem interface cable, use the pin diagrams in **Appendix C** as a guide.

NOTE: Pin-out requirements for null modem applications vary widely between manufacturers. If you have any questions about a specific application, contact Patton Electronics Technical Support.

4.2.4 Configuring the X.21 *QuikConnect*™ Module

The serial port on the X.21 *QuikConnect*™ Module is default wired as a DCE, but may be switched to a DTE. This is done by reversing the orientation of the DCE/DTE strap, as described below:

To reverse DCE/DTE orientation, remove the module according to the instructions in **Section 4.2.1**. The DCE/DTE strap is located on the bottom side of the module's PC board. The arrows on the top of the strap indicate the configuration of the X.21 port (for example, if the DCE arrows are pointing toward the DB-15 connector, the X.21 port is wired as a DCE). Reverse the DCE/DTE orientation by pulling the strap out of its socket, rotating it 180º, then plugging the strap back into the socket. You will see that the DCE/DTE arrows now point in the opposite directions, showing the new configuration of the X.21 port. Reinstall the module according to the instructions in **Section 4.2.1**.

4.3 CONNECTING POWER

The Model 1092A is available with two power supply options:

Universal Interface AC Power Supply option (**Model 1092A-UI**) operates in environments ranging from 100 to 253 VAC, with no re-configuration necessary (see **Appendix B** for available domestic and international power cords).

DC Power Supply option (**Model 1092A-DC**) operates in 48 VDC environments and is equipped with a 3-pin "terminal strip" style connector.

4.3.1 Connecting to an AC Power Source

The Universal Interface AC Supply is equipped with a male IEC-320 power connection. A domestic (US) power supply cord is supplied with the unit at no extra charge. To connect the standard or universal power supply, follow these steps:

1) Attach the power cord (supplied) to the shrouded male IEC-320 connector on the rear of the Model 1092A.

2) Plug the power cord into a nearby AC power outlet.

3) Turn the rear power switch ON.

4.3.2 Connecting to a DC Power Source

The 48 VDC power supply option uses a 3-pin terminal block with spring-type connectors. Please refer to the Model 1090 Series Service Manual.

WARNING! There are no user-serviceable parts in the power supply section of the Model 1092A. Voltage setting changes and fuse replacement should only be performed by qualified service personnel. Contact Patton Electronics Technical support at (301)975-1007, via our web site at http://www.patton.com, or by e-mail at support@patton.com, for more information.

5.0 OPERATION

Once the Model 1092A is properly configured and installed, it should operate transparently. This sections describes power-up, reading the LED status monitors, and using the built-in loopback test modes.

5.1 POWER-UP

To apply power to the Model 1092A, first be sure that you have read **Section 4.3**, and that the unit is connected to the appropriate power source. Then power-up the unit using the rear power switch.

5.2 LED STATUS MONITORS

The Model 1092A features eight front panel LEDs that monitor power, the DTE signals, network connection and test modes. Figure 6 (below) shows the front panel location of each LED. Following Figure 6 is a description of each LEDs function.

Figure 6. Model 1092A Front Panel

Note: LEDs described as yellow are red in earlier versions of the 1092A.

TD & RD Glows yellow to indicate an idle condition of Binary "1" data on the respective terminal interface signals. Green indicates Binary "0" data.

CTS Glows green to indicate that the Clear to Send signal from the modem is active. Yellow indicates an inactive Clear to Send signal from the modem.

CD Glows yellow if no carrier signal is being received from the remote modem. Green indicates that the remote modem's carrier is being received.

DTR Glows green to indicate that the Data Terminal Ready signal from the terminal is active.

ER Glows red to indicate the likelihood of a Bit Error in the received signal. During the 511 or 511/E test, ER will flash to indicate that the Test Pattern Detector has detected a bit error.

TM Glows yellow to indicate that the Model 1092A has

been placed in Test Mode. The unit can be placed in test mode by the local or remote user.

NS Glow red to indicate that the local Model 1092A has not yet connected with the remote

5.3 TEST MODES

The Model 1092A offers two proprietary loopback test modes, plus a built-in V.52 BER test pattern generator, to evaluate the condition of the modems and the communication link. These tests can be activated physically from the front panel, or via the interface.

5.3.1 Local Line Loopback (LLB)

The Local Line Loopback (LLB) test checks the operation of the local Model 1092A, and is performed separately on each unit. Any data sent to the local Model 1092A in this test mode will be echoed (returned) back to the user device (see Figure 7, below). For example, characters typed on the keyboard of a terminal will appear on the

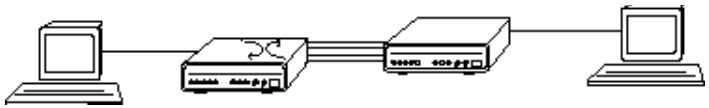

Figure 7. Local Line Loopback

terminal screen.

To perform an LLB test, follow these steps:

1. Activate LLB. This may be done in one of three ways:
   - Move the front panel toggle switch to the right to "Local".
   - Raise the LLB signal on the interface (see Appendix C).
   - Set Local Loop from the VT100 screen.

Once LLB is activated, the Model 1092A transmitter output is connected to its own receiver. Data is also looped back to the line. The "TM" LED should be lit.

2. Verify that the data terminal equipment is operating properly and can be used for a test.
3. Perform a V.52 BER (bit error rate) test as described in **Section 5.3.3**. If the BER test equipment indicates no faults, but the data terminal indicates a fault, follow the manufacturer's checkout procedures for the data terminal. Also, check the interface cable between the terminal and the Model 1092A.

5.3.2 Remote Digital Loopback (RDL)

The Remote Digital Loopback (RDL) test checks the performance of both the local and remote Model 1092As, and the communication link between them. Any characters sent to the remote Model 1092A in this test mode will be returned back to the originating device (see Figure 8, below). For example, characters typed on the keyboard of the local terminal will appear on the local terminal screen after having been passed to the remote Model 1092A and looped back.

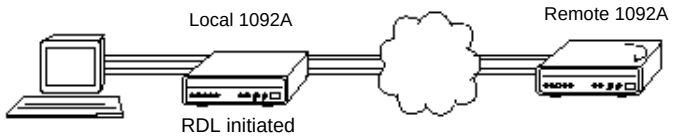

Figure 8. Remote Digital Loop

Important! Do not send a 511 test pattern from the test equipment when you connect external test equipment to the 1092A .

To perform an RDL test, follow these steps:

1. Activate RDL. This may be done in three ways:
   - Move the front panel toggle switch to the Left to "Remote".
   - Raise the RDL signal on the interface (see Appendix C).
   - Set Remote Loopback from the VT100 screen.

Note: Remote Loopback cannot be activated until approximately 45 seconds after the two modems have linked to each other.

2. Perform a V.52 BER test as described in **Section 5.3.3**. If the BER test equipment indicates a fault, and the Local Line Loopback test was successful for both Model 1092As, you may have a problem with the twisted pair line between the modems. You should then check the twisted pair line for proper connections and continuity.

5.3.3 Using the V.52 (BER) Test Pattern Generator

To use the V.52 BER tests in conjunction with the Remote Digital Loopback tests (or with Local Line Loopback tests), follow these instructions:

1. Locate the “511/511E” toggle switch on the front panel of the 1092A and move it UP. This activates the V.52 BER test mode and transmits a “511” test pattern into the loop. If any errors are present, the local modem’s red “ER” LED will blink sporadically.

2. If the above test indicates no errors are present, move the V.52 toggle switch DOWN, activating the “511/E” test with errors present. If the test is working properly, the local modem's red “ER” LED will glow. A successful “511/E” test will confirm that the link is in place, and that the Model 1092A’s built-in “511” generator and detector are working properly.

APPENDIX A

PATTON ELECTRONICS MODEL 1092A SPECIFICATIONS

Transmission Format:	Synchronous or asynchronous
Transmission Line:	Two or Four-Wire unconditioned twisted pair
Clocking:	Internal, external or receive loopback
Interface Modules:	EIA RS-232/ITU/T V.24, RS-232/530, ITU/T V.35, ITU/T X.21, 64k G.703, 10BaseT Ethernet, and Voice/Data
Data Rates:	Synchronous 19, 2, 32, 56, 64 & 128 kbps; Asynchronous0 - 38.4 kbps
Diagnostics:	V.52 compliant bit error rate pattern (511/511E pattern) generator and detector with error injection mode; Local Line Loopback and Remote Digital Loopback, activated by front panel switch or via serial interface
LED Status Indicators:	TD, RD, CTS, CD, DTR, NS(no signal), ER (error) and TM (test mode)
Connectors:	RJ-45 on line side; DB-25 female, M/34 female or DB-15 female on serial interface side, depending upon which interface module is installed.
Power:	100-253 VAC, 50-60 Hz (universal input); 48 VDC (option). 10 watts.
Temperature Range:	32-122°F (0° -50°C)
Altitude:	0-15,000 feet
Humidity:	5 to 95% non-condensing
Dimensions:	7.3” x 6.6” x 1.62” (185mm x 168mm x 41mm)
Weight:	2.01 lbs. (1.0kg)

2-Wire Distance Table in miles (km)

Data Rate	AWG Wire Gauge (mm)			
	19(.9)	22(.6)	24(.5)	6(.4)
All Rates	10.8(17.2)	7.2(11.5)	5.0(8.0)	3.4 (5.5)

4-Wire Distance Table in miles (km)

Data Rate	Wire Gauge			
	19(.9)	22(.6)	24(.5)	6(.4)
All Rates	11.4(18.2)	7.6(12.1)	5.3(8.5)	3.6(5.7)

APPENDIX B

PATTON ELECTRONICS MODEL 1092A FACTORY REPLACEMENT PARTS AND ACCESSORIES

Patton Electronics Model #	Description
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	64KG.703 with RJ45
IM1/I	10BT with RJ45
IM1/JO	Voice Data Module
IM1/I4	10BT 4-Port Ethernet Bridge
IM1/JS	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

APPENDIX C

PATTON ELECTRONICS MODEL 1092A INTERFACE PIN ASSIGNMENT

RS-232, RS-530 Interface Pin Description
(DB-25 Female Connector)
(DCE Configuration)

Pin #	Signal
1	FG (Frame Ground)
2	TD (Transmit Data)
3	RD (Receive Data)
4	RTS (Request to Send)
5	CTS (Clear to Send)
6	DSR (Data Set Ready)
7	SGND (Signal Ground)
8	CD (Carrier Detect)
9	RC/ (Receive Timing-B)
10	CD/ (Carrier Detect-B)
11	XTC/ (External Transmit Clock)
12	TC/ (Transmit Timing-B)
13	CTS/ (Clear to Send)
14	TD/ (Transmit Data-B)
15	TC (Trasmit Timing-A)
16	RD (Receive Data)
17	RC (Receive Timing)
18	LLB (Local Line Loop)
19	RTS/ (Request to Send)
20	DTR (Data Terminal Ready)
21	RDL (Remote Digital Loop)
22	DSR/ (Data Set Ready)
23	DTR/ (Data Terminal Ready)
24	XTC (External Transmit Clock)
25	TM (Test Mode)

PATTON ELECTRONICS MODEL 1092A INTERFACE PIN ASSIGNMENT (Continued)

V.35 Interface (M/34F Female Connector) (DCE Configuration)

Pin #	Signal
B	SGND (Signal Ground)
C	RTS (Request to Send)
D	CTS (Clear to Send)
E	DSR (Data Set Ready)
F	CD (Carrier Detect)
H	DTR (Data Terminal Ready)
L	LLB (Local Line Loop)
M	TM (Test Mode)
N	RDL (Remote Digital Loop)
P	TD(Transmit Data)
R	RD (Receive Data)
S	TD/ (Transmit Data-B)
T	RD/ (Receive Data-B)
U	XTC (External Transmit Clock)
V	RC(Receive Timing)
W	XTC/ (External Transmit Clock)
X	RC/ (Receive Timing)
Y	TC(Transmit Timing-A)
AA	TC/ (Transmit Timing-B)

PATTON ELECTRONICS MODEL 1092A INTERFACE PIN ASSIGNMENT (Continued)

X.21 Interface (DB-15 Female Connector) (DTE /DCE Configuration)

Pin #	Signal
1	Frame Ground
2	T (Transmit Data-A)
3	C (Control-A)
4	R (Receive Data-A)
5	I (Indication-A)
6	S (Signal Element timing-A)
7	BT (Byte Timing-A)
8	SGND (Signal Ground)
9	T/ (Transmit Data-B)
10	C/ (Control-B)
11	R/ (Receive Data-B)
12	I/ (Indication-B)
13	S/ (Signal Element Timing-B)
14	BT/ (Byte Timing-B)

APPENDIX D

PATTON ELECTRONICS MODEL 1092A
CONTROL PORT PIN ASSIGNMENT

The 1092A control port is an 8 position connector, compliant with EIA/TIA-561.

Pin Function	RJ45 Pin No.
Ground	4
Receive data (to DTE)	5
Transmit data (from DTE)	6

APPENDIX E

PATTON ELECTRONICS MODEL 1092A
UIC START GUIDE

1) To perform a hardware reset, turn the power off and set configuration switch (S1-6 and 7 “OFF").

2) Turn on the power for 5 or 10 seconds. Turn the power OFF and re-configure the model 1092A using the following configuration. One unit must be set as Master the other unit as Slave.

MASTER UNIT SETTINGS

S1-1 "ON"
S1-2 "OFF"
S1-3 "ON"
S1-4 and 5 "OFF"
S1-6 and 7 "ON"
S1-8 "ON"
S2-1, 2, and 3 "OFF"
S2-4 "ON" (4-wire operation) "OFF" (2-wire operation)
S2-5 "OFF"
S2-6, 7 and 8 "ON"

SLAVE UNIT SETTINGS

S1-1 "ON"
S1-2 "OFF"
S1-3 "ON"
S1-4 and 5 "OFF"
S1-6 "ON"
S1-7 "OFF"
S1-8 "ON"
Switch S2 settings are the same as the MASTER UNIT.

3) Connect the twisted pair circuit between the model 1092A's, turn on the power, after 10 to 15 seconds the NS (no signal)- LED will go off and the CD (carrier detect) LED will turn GREEN.

4) Perform a LOCAL LINE LOOP-BACK test using the 511/511E test switch (See section 5.3.1).

5) Approximately 45 seconds after the units link up, perform a REMOTE DIGITAL LOOP-BACK test using the 511/511E test switch. (See section 5.3.2).