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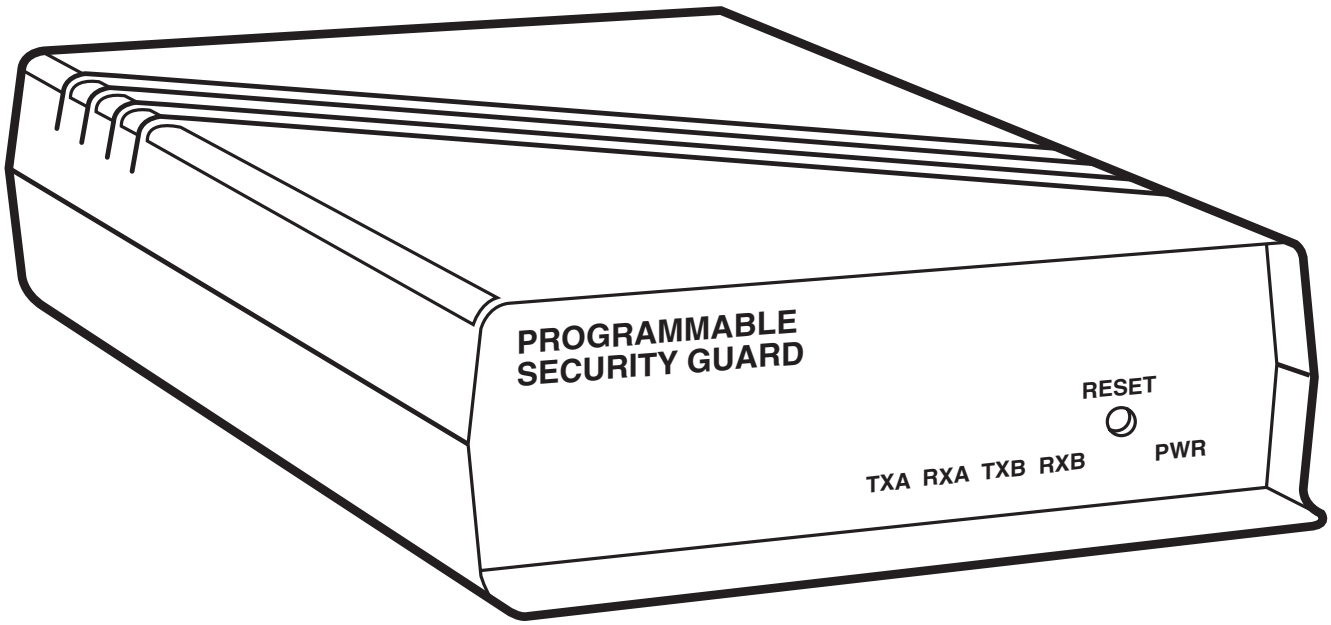
NETWORK SERVICES

AUGUST 1995
SD015A

Programmable Security Guard



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This equipment generates, uses, and can radiate 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 communication. It 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 against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

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This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

INSTRUCCIONES DE SEGURIDAD (Normas Oficiales Mexicanas Electrical Safety Statement)

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
    - A: El cable de poder o el contacto ha sido dañado; u
    - B: Objectos han caído o líquido ha sido derramado dentro del aparato; o
    - C: El aparato ha sido expuesto a la lluvia; o
    - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
    - E: El aparato ha sido tirado o su cubierta ha sido dañada.

Contents

Chapter **Page**

Contents (continued)

1. Specifications

Pins Supported — 1-8, 20, and 22

Data Rates — 45.5 to 38,400 bps (each port individually selectable)

Memory — 1K buffer

Indicators — RXD and TXD for each port; Power

Enclosure — High-impact plastic

Interface — Asynchronous RS-232-C/V.24

Connectors — (2) DB9S 9-pin sub-D female

Power — Wallmount transformer

Size — 1.8"H x 5.5"W x 8.5"D (4.6 x 14.0 x 21.6 cm)

Weight — 2 lb. (0.9 kg)

2. Introduction

The Programmable Security Guard (PSG) adds security to any RS-232 asynchronous port, to help protect your computer resources from unauthorized accesses. The PSG is an in-line buffer box with three modes of operation:

- Security Mode
- Pass-Thru Mode
- Program Mode

After a reset, the unit is in "Security Mode." While in Security Mode the unit acts as an open switch, and will not pass any data until certain security barriers are broken. Once valid users successfully pass through the security barriers, the unit will change its mode to "Pass-Thru." In Pass-Thru Mode the unit buffers data received from each port and retransmits this data out the other port, using the configured word structure, data rate, and flow control of that port. Program Mode is used to enter and update passwords and other parameters for the security barriers.

2.1 Main Security Barriers

- Primary password validation
- User's location validation ("callback")
- Secondary password validation

2.2 Features

- Configurable by the user via software (program mode) and DIP-switch selection.
- 1K of memory available for buffering.
- Each port can be individually configured, via DIP switches, for word structure (7 or 8 data bits, even/odd/no parity), data rate (45.5 to 38.4 Kbps), and flow control (X-ON/X-OFF or DTR/CTS).
- Battery-backed-up memory saves all programmed information automatically in case the power fails.
- Program mode for entering primary passwords and their associated parameters.
- Primary passwords can be assigned to either or both ports of the PSG, for security protection in any direction.
- DIP-switch-selectable password retry count (1, 2, 3, or infinite).
- DIP-switch-selectable maximum time period for entering primary and secondary passwords (10 seconds, 30 seconds, 1 minute, 2 minutes).
- Internal memory storage of up to 64 different primary passwords, associated response strings, and secondary passwords.
- User-programmed primary and secondary passwords: up to 32 characters long.
- Optional status messages like:

  "invalid password"

  "primary password accepted, unit now in pass-thru mode"

  "primary password accepted, prepare for user location validation"

  "primary password accepted, enter secondary password"

  "secondary password accepted, unit now in pass-thru mode"

NOTE: These messages can be disabled via DIP switch on an individual-port basis for additional security.

- Optional response string programmable for every primary password defined by the user. User-programmed response strings can be up to 32 characters in length.
- Onboard clock so that the user can program certain passwords as valid only during specific times of the day (for example, night; evening).

2.3 Front-Panel Indicators

There are 5 LEDs on the unit's right front panel.

- Power LED: Lights when power is present.
- RXDA: Flashes when Port A is receiving data.
- TXDA: Flashes when Port A is transmitting data.
- RXDB: Flashes when Port B is receiving data.
- TXDB: Flashes when Port B is transmitting data.

2.4 Reset Button

The location of the reset button is shown in Fig. 3-1. Any time you make changes to the internal switch settings, you must press the reset button to activate the changes. While the PSG is resetting, it cannot process data.

NOTE: Disconnecting power from the PSG will also reset the unit.

3. Installation

Installing the PSG involves the following steps:

1. Setting the internal DIP switches for individual port configurations.
2. Connecting devices to the ports.
3. Supplying power.

3.1 Setting Internal DIP Switches for Individual Port Configurations

Remove the unit's cover to expose the PC board.

Figure 3-1 shows the internal switch locations.

IMPORTANT

The internal DIP switches on your PSG may be labeled either OPEN and CLOSED or ON and OFF. For all internal DIP switches in the PSG, OPEN=OFF and CLOSED=ON.

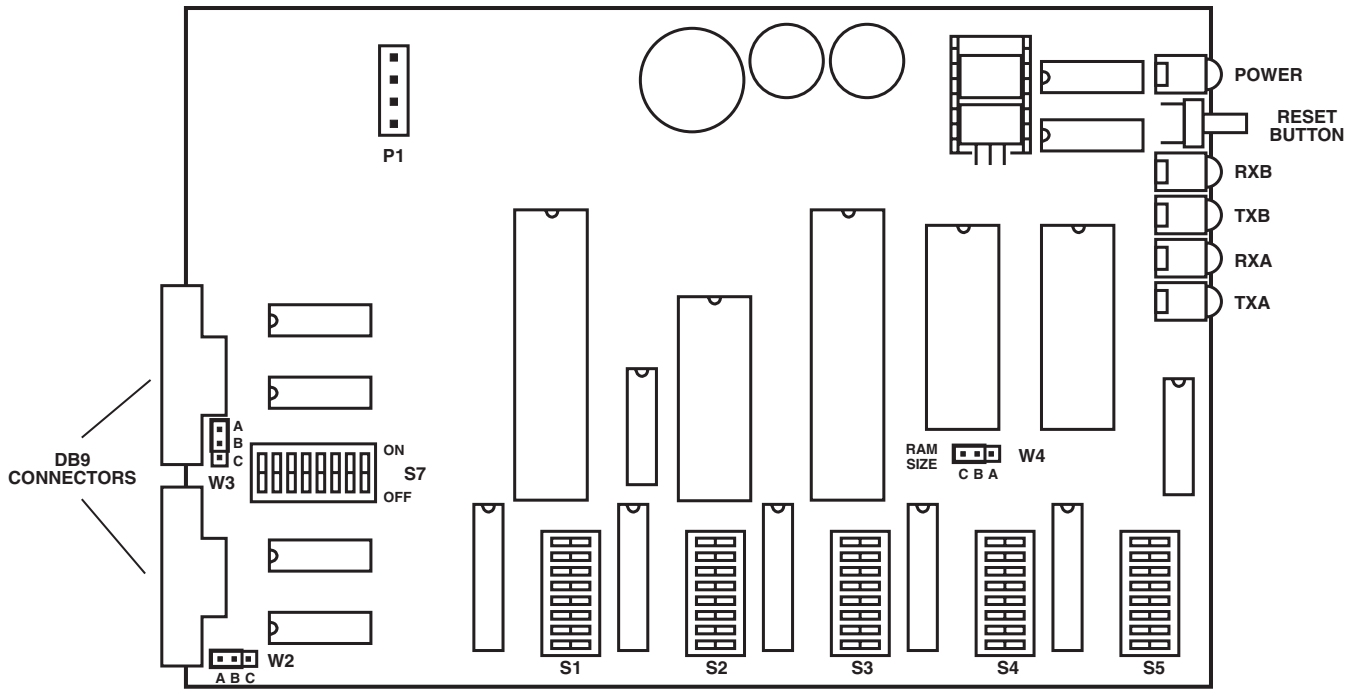


Figure 3-1. Internal Switch Locations for the PSG.

Tables 3-1 to 3-6 show the switch position settings. Table 3-7 shows the jumper settings. Several options can be configured for each port individually: Baud Rate, Parity, Data Bits per Word, Flow Control, and Modem Controls.

Table 3-1. SWITCH S1 (Port A: Options)

OPTION	SWITCH POSITION SETTING							
	1	2	3	4	5	6	7	8
STOP BITS								
1	OFF	OFF						
1.5	ON	OFF						
1	OFF	ON						
2	ON	ON						
PARITY								
Odd			OFF					
Even			ON					
PARITY								
Disable				OFF				
Enable				ON				
DATA BITS								
8					OFF			
7					ON			
FLOW CONTROL								
Hardware						OFF		
Software						ON		
MODEM CONTROL								
Disable							OFF	
Enable							ON	
PROGRAM MODE								
Disable								OFF
Enable								ON

Table 3-2. SWITCH S2 (Port B: Options)

OPTION	SWITCH POSITION SETTING							
	1	2	3	4	5	6	7	8
STOP BITS								
1	OFF	OFF						
1.5	ON	OFF						
1	OFF	ON						
2	ON	ON						
PARITY								
Odd			OFF					
Even			ON					
PARITY								
Disable				OFF				
Enable				ON				
DATA BITS								
8					OFF			
7					ON			
FLOW CONTROL								
Hardware						OFF		
Software						ON		
MODEM CONTROL								
Disabled							OFF	
Enabled							ON	
PROGRAM MODE								
Disable								OFF
Enable								ON

Select Modem Control Enabled (Position 7 of either Switch 1 or Switch 2, Position 7) for the port to which the modem is connected.

Table 3-3. SWITCH S3 (Port A: Baud Rate).

OPTION	SWITCH POSITION SETTING							
BAUD RATE (bps)	1	2	3	4	5	6	7	8
38400	OFF	OFF	OFF	OFF	OFF			
19200	ON	OFF	OFF	OFF	OFF			
9600	OFF	ON	OFF	OFF	OFF			
4800	ON	ON	OFF	OFF	OFF			
4800	OFF	OFF	ON	OFF	OFF			
2400	ON	OFF	ON	OFF	OFF			
2400	OFF	ON	ON	OFF	OFF			
1828.72	ON	ON	ON	OFF	OFF			
1371.54	OFF	OFF	OFF	ON	OFF			
1200	ON	OFF	OFF	ON	OFF			
1037.92	OFF	ON	OFF	ON	OFF			
600	ON	ON	OFF	ON	OFF			
300	OFF	OFF	ON	ON	OFF			
200	ON	OFF	ON	ON	OFF			
164.82 OFF	ON	ON	ON	OFF				
150 ON	ON	ON	ON	OFF				
1371.54 OFF	OFF	OFF	OFF	ON				
1200 ON	OFF	OFF	OFF	ON				
1037.92 OFF ON	OFF	OFF	ON					
600 ON	ON	OFF	OFF	ON				
300 OFF	OFF	ON	OFF	ON				
200 ON	OFF	ON	OFF	ON				
164.82 OFF ON	ON	OFF	ON					
150 ON	ON	ON	OFF	ON				
134.28 OFF OFF	OFF	ON	ON					
110.35 ON OFF	OFF	ON	ON					
100 OFF	ON	OFF	ON	ON				
74.42 ON ON	OFF	ON	ON					
67.14 OFF OFF	ON	ON	ON					
55.82 ON OFF	ON	ON	ON					
50 OFF	ON	ON	ON	ON				
45.5 ON	ON	ON	ON	ON				
CALLBACK DELAY								
5 seconds						OFF	OFF	
10 seconds						ON	OFF	
20 seconds						OFF	ON	
30 seconds						ON	ON	
STATUS MESSAGES, PORT A								
DISABLE								OFF
ENABLE								ON

Table 3-4. SWITCH S4 (Port B: Baud Rate).

OPTION	SWITCH POSITION SETTING							
BAUD RATE	1	2	3	4	5	6	7	8
38400	OFF	OFF	OFF	OFF	OFF			
19200	ON	OFF	OFF	OFF	OFF			
9600	OFF	ON	OFF	OFF	OFF			
4800	ON	ON	OFF	OFF	OFF			
4800	OFF	OFF	ON	OFF	OFF			
2400	ON	OFF	ON	OFF	OFF			
2400	OFF	ON	ON	OFF	OFF			
1828.72	ON	ON	ON	OFF	OFF			
1371.54	OFF	OFF	OFF	ON	OFF			
1200	ON	OFF	OFF	ON	OFF			
1037.92	OFF	ON	OFF	ON	OFF			
600	ON	ON	OFF	ON	OFF			
300	OFF	OFF	ON	ON	OFF			
200	ON	OFF	ON	ON	OFF			
164.82	OFF	ON	ON	ON	OFF			
150	ON	ON	ON	ON	OFF			
1371.54	OFF	OFF	OFF	ON				
1200	ON	OFF	OFF	OFF	ON			
1037.92	OFF	ON	OFF	OFF	ON			
600	ON	ON	OFF	OFF	ON			
300	OFF	OFF	ON	OFF	ON			
200	ON	OFF	ON	OFF	ON			
164.82	OFF	ON	ON	OFF	ON			
150	ON	ON	ON	OFF	ON			
134.28	OFF	OFF	OFF	ON	ON			
110.35	ON	OFF	OFF	ON	ON			
100	OFF	ON	OFF	ON	ON			
74.42	ON	ON	OFF	ON	ON			
67.14	OFF	OFF	ON	ON	ON			
55.82	ON	OFF	ON	ON	ON			
50	OFF	ON	ON	ON	ON			
45.5	ON	ON	ON	ON	ON			
PASS DCD PORT A TO RTS PORT B								
RTS PORT B ON						OFF		
PASS-THRU						ON		
PASS DCD PORT B TO RTS PORT A								
RTS PORT A ON							OFF	
PASS-THRU							ON	
STATUS MESSAGES, PORT B								
DISABLE								OFF
ENABLE								ON

Table 3-5. SWITCH S5 (System Options)

OPTION	SWITCH POSITION SETTING							
	1	2	3	4	5	6	7	8
RETRY COUNT								
1	OFF	OFF						
2	ON	OFF						
3	OFF	ON						
Infinite	ON	ON						
PASSWORD TIMEOUT								
10 seconds			OFF	OFF				
30 seconds			ON	OFF				
1 minute			OFF	ON				
2 minutes			ON	ON				
INACTIVITY TIMEOUT								
30 seconds					OFF	OFF		
1 minute					ON	OFF		
5 minutes					OFF	ON		
10 minutes					ON	ON		
RESERVED FOR FUTURE USE							OFF	OFF

When you configure Retry Count via S5 Positions 1 and 2, you choose the number of times the PSG will try to connect to the modem before hanging up. You can choose 1, 2, 3, or infinite tries. When you configure the password timeout via S5 Positions 3 and 4, you choose how long the PSG will wait for you to enter a password. Select 10 seconds, 30 seconds, 1 minute, or 2 minutes. When you configure the inactivity timeout via S5 Positions 5 and 6, you select how long the PSG will wait for user input. Choose 30 seconds, 1 minute, 5 minutes, or 10 minutes.

Table 3-6. SWITCH S7 (Lead Options)

OPTION	SWITCH POSITION SETTING							
	1	2	3	4	5	6	7	8
RI INPUT PORT A Forced inactive Monitored	OFF ON							
DTR OUTPUT,PORT A Forced active Controlled		OFF ON						
DCD INPUT PORT A Forced active Monitored			OFF ON					
CTS INPUT, PORT A Forced active Monitored				OFF ON				
RI INPUT, PORT B Forced inactive Monitored					OFF ON			
DTR OUTPUT, PORT B Forced active Controlled						OFF ON		
DCD INPUT, PORT B Forced active Monitored							OFF ON	
CTS INPUT, PORT B Forced active Monitored								OFF ON

NOTE: Switch 7 settings are functional only if Switch 1, Position 7 and Switch 2, Position 7 are enabled for modem control. Configure the modem to hang up when DTR drops and to drop DCD when the connection is broken.

Table 3-7. Jumper Settings

FUNCTION	JUMPER POSITION
DSR OUTPUT, PORT A : FORCED ACTIVE	W2 - BC
DSR OUTPUT, PORT A : NO CONNECTION	W2 - AB
DSR OUTPUT, PORT B: FORCED ACTIVE	W3 - BC
DSR OUTPUT, PORT B: NO CONNECTION	W3 - AB

3.2 Connecting Devices to the Ports

Once you configure the internal switches and jumpers, you are ready to connect the PSG to the input/output devices.

1. Verify that the power-supply connector is properly inserted into the 4-pin male connector on the PSG printed-circuit-board assembly.
2. Put the unit's cover back in place.
3. Connect the input/output device cables to Port A and Port B of the PSG.
4. Plug the wallmount power supply into a suitable outlet.

Your installation is now complete.

3.3 Setting up Modem Options

Follow these recommendations to set up modem options:

- Set the modem to respond to DTR.
- Set DCD to normal (respond to remote).
- Enable line-current disconnect for both modems.

4. Operation

4.1 Security Mode

In Security Mode the PSG will monitor received data and input control leads (if applicable) until security barriers are successfully negotiated.

4.1.1 How to Enter Security Mode

You can enter security mode after you do any of the following:

- Reset the unit.
- Exit from Program Mode.
- Exit from Pass-Thru Mode.

4.1.2 How to Exit Security Mode

- Enter Program Mode.
- Enter Pass-Thru Mode.

4.1.3 How the PSG Reenters Security Mode

- Any connected modem links are disconnected, and the password retry and timer values are reset.
- The time limit is exceeded when password(s) are being entered.
- The modem connection is broken (DCD input becomes inactive for 10 milliseconds when modem controls are enabled).
- Unsuccessful attempt at a callback (DCD does not become active after the response string has been transmitted when modem controls are enabled).
- Exit command is issued to break modem link.

4.1.4 Password Validation

You can program the unit for 64 different primary and secondary passwords, 1-32 characters long. The passwords may be valid at either port or both, and passwords may also be valid at only certain times of the day. Received passwords must be immediately followed by a carriage-return character. The PSG will compare the string of received data preceding a carriage return (maximum of 32 characters) to the programmed passwords that are valid for that port at that time of day. Note that you have a certain amount of time to enter a valid password. If you don't enter the password in this time period the PSG will reenter Security Mode.

If the PSG receives a password in error the unit can optionally transmit a status message back to the user ("invalid password"). The unit can be configured for 1, 2, 3, or infinite retries at entering a valid password. Once the user meets this limit the unit will go into a submode called "Security Lock-Out" mode. In this mode, the unit will ignore all input from the sending port until the unit reenters Security Mode. The PSG will reenter Security Mode when the password timeout expires or when modem controls are enabled.

If the PSG receives a valid password before the retry count is met and the password timeout expires, then the unit will check whether the individual password it received has a response string associated with it and whether modem controls are enabled for that port.

If no response string is present, the unit will not attempt to call the user back. It will go directly to SECONDARY PASSWORD VALIDATION. If the unit doesn't receive a password, refer to **Section 4.1.6**.

4.1.5 Callback After Password Validation

If it is configured to transmit status messages, the unit will transmit "PREPARE FOR USER LOCATION VERIFICATION." Then it will call back using the response string for that password as a dialing string. If the dialing string contains embedded carriage returns, you can enter the returns as an ASCII period (".") . This callback feature adds additional security if a computer hacker stumbles across a password.

The PSG will then disconnect the attached modem by dropping DTR output for 3 seconds. The PSG next calls the user back at the appropriate dialing string. See **Section 4.5 (**"Modem Control Procedures") for a more detailed description of this procedure. If another modem does not answer the call (DCD input is not active), the PSG will abort the callback by hanging up the local modem and reentering Security Mode.

If a modem answers the callback, the PSG will proceed directly to SECONDARY PASSWORD VALIDATION.

4.1.6 Secondary Password Validation

The unit will transmit "ENTER SECONDARY PASSWORD" (if it is configured to transmit status messages). The unit will now begin checking input from the user against the secondary password. The PSG will compare the string of received data preceding a carriage return (maximum of 32 characters) to the programmed secondary password. You have a (user-configured) limit to enter the valid secondary password. If this limit is exceeded the PSG will reenter Security Mode.

If a secondary password was received in error the unit can optionally transmit a status message back to the user ("invalid password"). The same retry count is used for the secondary password as in the primary password. Once the user meets this limit the unit will reenter Security Mode after the password timeout expires. If modem controls are enabled, then DTR output will be dropped to disconnect the call and the unit reenters Security Mode.

If a valid password is received before the retry count is met or the time period expires, then the unit will transmit the status message, "secondary password accepted, unit now in pass-thru mode" (if it is configured to transmit status messages). The PSG will then exit Security Mode and enter Pass-Thru Mode.

4.1.7 Entering or Reentering Security Mode

You can reenter Security Mode after any of the following events:

- password retry limit is exceeded.
- password time limit is exceeded.
- Modem controls are enabled and a callback attempt is unsuccessful.
- Modem controls are enabled and DCD input goes inactive, indicating user-aborted connection from a dialup modem.
- PSG receives the *@exit@* command when in Pass-Thru Mode. NOTE: This command is case sensistive: you must type in in lower case.

When you enter or reenter Security Mode, the PSG will restart its retry count and stop the password timer until the PSG receives the next byte of data. If modem controls are enabled, the unit will drop its DTR output until DCD from the modem drops too.

The PSG will keep RTS output always active. The PSG will monitor RI and DCD input and drive DTR output unless you option the unit through DIP switches for no modem controls.

In that case, the unit will not monitor RI and DCD input and the PSG's DTR output will become active on reset. DTR output will stay active unless the unit is configured to run DTR/CTS flow control. In that case, DTR output will drop when the PSG's internal buffer is too full.

4.2 Pass-Thru Mode

In Pass-Thru Mode, the PSG will buffer and retransmit all data received in each port out the other port, using the word structure, baud rate, and flow control configured for that port.

4.2.1 How to Enter Pass-Thru Mode

Successfully negotiate the security barriers of either port while in Security Mode.

4.2.2 How to Exit Pass-Thru ModE

You can exit Pass-Thru Mode after any of the following events:

- User disconnects call from remote modem (if modem controls were enabled).
- Unit receives the Exit Pass-Thru Mode command (*@exit@*). NOTE: This command is case sensitive. You must type it in lower case letters.
- The user-selectable "No Activity" timeout (30 seconds, 1 minute, 5 minutes, or 10 minutes) expires.

4.3 Program Mode

Program Mode configures the unit with user-supplied passwords and their associated parameters. The parameters define the options associated with each password.

Program Mode is menu-driven. To use Program Mode you will need a dumb terminal or similar device. No cursor positioning is used; the only control characters used in the menu screens are the carriage-return and linefeed characters that terminate every line.

4.3.1 How to Enter Program Mode

You can access Program Mode through either port. When one port is in Program Mode, the other port will be disabled, and will not monitor any data or control leads.

There are two ways to access Program Mode from the local port:

1. Enter a user-programmable Program Mode password (if it is already programmed into the unit).
2. If no Program Mode password has been programmed, toggle the Program Mode DIP switch (Note: You must remove the unit's lid to toggle the DIP switch). Toggling the Program Mode DIP switch will get you into Program Mode, and you can then define a Program Mode password to be used in future reprogramming.

4.3.2 How to Exit Program Mode

Choose the "Exit Program Mode" option from the main programming menu.

4.3.3 Step-by-Step Procedure

Within Program Mode, a menu-driven program assists the user with adding and editing passwords and their associated parameters.

Figure 4-1 shows what the main programming menu looks like:

```
PROGRAM MODE MENU:

(1) ADD a new password and its associated parameters

(2) DELETE an old password and its associated parameters

(3) LIST & EDIT one existing password and its associated parameters

(4) LIST ALL passwords

(5) DISPLAY/SET the clock

(6) CLEAR password table

(7) EXIT from program mode

Please enter your selection (1-7):
```

Fig. 4-1. The Program Mode Menu.

NOTE: The clock is accurate to within a few minutes a month. Use Option (5) to set and reset the clock.

To select (1) ADD a new password, type 1 and press <Enter>.

The software then prompts you for password information:

```
ENTER PASSWORD NUMBER 01-64 FOLLOWED BY CR:
```

Type 01 and press <Enter> (Carriage Return). The software prompts you for a primary and secondary password and a response string:

```
PRIMARY PASSWORD:

SECONDARY PASSWORD:

RESPONSE STRING:
```

Type your primary password and press <Enter>. Type your secondary password and press <Enter>. If you want the modem to call you back, enter the dialing string for your modem.

If you don't want the modem to call you back, leave the response string blank.

Here's an example of a Hayes dialing string:

ATDT5551212.

NOTE: Always end the dialing string with a period.

The following screen appears:

```
DAY        6 AM  -> 5 PM
EVENING    5 PM  -> 12 PM
NIGHT      12 PM -> 6 AM

1. D = DAY
2. E = EVENING
3. N       = NIGHT
4. DE= DAY & EVENING
5. DN      = DAY & NIGHT
6. EN      = EVENING & NIGHT
7. DEN     = DAY, EVENING,& NIGHT

ENTER TIME PERIOD NUMBER 1-7 FOLLOWED BY CR:
```

Enter the number that corresponds to the time period you wish to select. The following screen appears:

NOTE: This will tell you when (what time of day) the PSG will allow you to access the system.

```
1. PORT A

2. PORT B

3. BOTH PORTS

ENTER NUMBER 1-3 FOLLOWED BY CR:
```

Type 1, 2, or 3 and press <Enter>. The screen prompts:

```
1. USER PASSWORD
2. PROGRAMMING MODE PASSWORD
ENTER NUMBER 1-2 FOLLOWED BY CR:
```

Type 1 or 2 and press <Enter>. The Program Mode menu reappears.

Choose programming only if this user should be calling in and changing the configuration of the PSG. If not, you must use the DIP switch to set the initial password.

```
PROGRAM MODE MENU:
(1) ADD a new password and its associated parameters
(2) DELETE an old password and its associated parameters
(3) LIST & EDIT one existing password and its associated parameters
(4) LIST ALL passwords
(5) DISPLAY/SET the clock
(6) CLEAR password table
(7) EXIT from program mode
Please enter your selection (1-7):
```

Type 2 and press <Enter>. The software prompts:

```
ENTER PASSWORD NUMBER 01-64 FOLLOWED BY CR:
```

Enter the 2-digit location number of the password you wish to delete. For example, 01 would delete the first password programmed in Location 01.

```
    PROGRAM MODE MENU:
    (1) ADD a new password and its associated parameters
    (2) DELETE an old password and its associated parameters
    (3) LIST & EDIT one existing password and its associated parameters
    (4) LIST ALL passwords
    (5) DISPLAY/SET the clock
    (6) CLEAR password table
    (7) EXIT from program mode
    Please enter your selection (1-7):
```

Select Option (4) LIST ALL passwords, by typing 4.
The following screen appears:

```
 PASSWORD KEY:        P-precedes the primary password  S-precedes secondary
 TIME (valid) KEY:          CURRENT TIME:  00:04:58
                                           DEN = DAY, EVENING, & NIGHT
 DAY       6 AM -> 5 PM     D = DAY         DE = DAY & EVENING
 EVENING   5 PM -> 12 PM    E = EVENING           DN = DAY & NIGHT
 NIGHT     12 PM -> 6 AM    N = NIGHT       EN = EVENING & NIGHT
                                                          T   P     T
 PORT (valid) KEY:  A = port A   B = port B AB = both ports    I   O     Y
 (PRESS ANY KEY TO SCROLL, PRESS RETURN TO RETURN TO MENU)     M   R     P
 #:  PASSWORD:                              RESPONSE STRING:  E   T     E

 01 P-PASSWORD                              ATDT7465500.       DEN AB   U
 S-SPASSWORD
 02 P-
   S-
03 P-
S-
04 P
S
```

The Program Mode menu reappears:

```
PROGRAM MODE MENU:
(1) ADD a new password and its associated parameters
(2) DELETE an old password and its associated parameters
(3) LIST & EDIT one existing password and its associated parameters
(4) LIST ALL passwords
(5) DISPLAY/SET the clock
(6) CLEAR password table
(7) EXIT from program mode
Please enter your selection (1-7):
```

Choose Option (5) by typing 5 and pressing <Enter>.

The following prompt appears:

```
CURRENT TIME IS:  00:05:05
ENTER NEW TIME:
```

Type the new time, in the format HH:MM:SS, where H=hours, M=minutes, and S=seconds.

The program menu appears again. Select Option (6), CLEAR password table, by typing 6 and pressing <Enter>. The program menu reappears. Exit from Program Mode by typing 7 and pressing <Enter>.

4.3.4 Program Mode Options

Each password has its associated parameters. These parameters are options. You can edit the password and any or all of its options through the LIST & EDIT function of the main programming menu. To define a primary password and its options, these are the typical steps (or prompts) the user must traverse:

- Define a primary password.
- Define a secondary password.
- Define the response string (for example, "ATDT7465500").
- Define the time period when this password is valid.
- Define for which port(s) this password is to be used.
- Define the password type—"user" or "programming mode" password.

NOTE: All other options, such as retry counts and timeouts, are the same for all primary passwords. These other options are configurable via hardware DIP switch selection.

4.3.5 Add, Delete, List, and Edit Options

These options allow you to add, delete, list, and edit one password and its associated parameters. The unit can store up to 64 different primary passwords and associated parameters. The PSG will prompt the security manager for a password number when the ADD, DELETE or LIST & EDIT function is selected from the main programming menu. If you forget the number of the password you want to delete or edit, you can select the LIST ALL function from the main menu. This function will list the password number beside each password.

4.3.6 Setting the Clock

With the PSG clock, you can program passwords to be valid at only certain times of the day. The internal clock in the PSG is accurate to within a few minutes a month. Use the SET clock option on the main menu to initially set the clock and to keep it accurate.

4.3.7 List-All Menu Option

Figure 4-2 shows a sample screen generated by the "LIST ALL" option of the main programming menu.

```
PASSWORD KEY: P- precedes the primary password  S- precedes secondary


TIME (valid) KEY:                CURRENT TIME: 08:00:03
                             DEN = DAY, EVENING, & NIGHT
DAY    6 AM -> 5 PM    D = DAY       DE = DAY & EVENING
EVENING 5 PM -> 12 PM      E = EVENING       DN = DAY & NIGHT
NIGHT  12 AM -> 6 AM    N = NIGHT       EN = EVENING & NIGHT
(PRESS ANY KEY TO SCROLL, PRESS RETURN TO RETURN TO MENU)
                                                              T  P T
PORT (valid) KEY: 1 = Port #1 2 = Port #2 B = both ports    I  O Y
                                                              M  R P
#: PASSWORD:                RESPONSE STRING:         E  T E
01 P-SUPERMAN               ATDT7465500.               DEN  1 P
   S-LOIS
02 P-BATMAN                                 D  B U
   S-ROBIN
03 P-12345678901234567890123 12345678901234567890123       N  2 U
   S-ABCDEFGHIJKLMNOQRSTUVWXY
```

Figure 4-2. The LIST-ALL Option of the Main Programming Menu.

4.4 RS-232 Control Leads Supported

Table 4-1 lists the control leads supported by the PSG and when they are used.

Table 4-1. RS-232 Control Leads Supported.

DB9 PIN	INPUTS	OUTPUTS	DESCRIPTION	WHEN USED
3		TXD	Transmit Data	Driven with TX data
2	RXD		Receive Data	Monitored for RX data
7		RTS	Request to Send	Always active
8	CTS		Clear to Send	Monitored when hardware flow control is used
6		DSR	Data Set Ready	Jumper-selectable active or open
5	GND	GND	Signal Ground	Reference signal
1	DCD		Data Carrier Detect	Monitored when modem controls are used
4		DTR	Data Terminal Ready	Toggles when hardware flow control or modem control is used
9	RI		Ring Indicator	Monitored when modem controls are used

NOTE: The PSG comes with 2 DB9 ports. DB9-to-DB25 adapter cables (straight and cross) are available separately.

4.5 Modem Control Procedures and Timing Requirements

4.5.1 Answering an Incoming Call

The PSG will detect incoming calls on either port. The RS-232 signal "RI Active" indicates that the attached modem is receiving an incoming call. After the PSG recognizes two rings, it will raise DTR to the modem. This allows the modem to answer automatically according to the modem's preset number of rings, unless the PSG is in the middle of a callback sequence. After the PSG raises DTR, DCD input must become active within one minute to indicate a successful connect with another modem. Otherwise, the unit will reset to Security Mode.

4.5.2 Disconnecting at a Remote Modem

The PSG will monitor DCD input to detemine when a call is disconnected (DCD must go from active to inactive). When DCD input goes inactive for 10 milliseconds, the PSG will assume that the call has been disconnected.

4.5.3 Disconnecting a Call from the Local Modem

The PSG will drop its DTR output signal upon receiving the exit command to disconnect a call. DTR output will stay inactive for at least two seconds to assure that the call terminates.

4.5.4 Making a Callback

The PSG will first disconnect any existing connection to a remote modem. The PSG will then raise its DTR output (remember, RTS output is always active), and then send the predetermined dialing string. This string should be comprised of your modem's command to make the call and the telephone number to dial.

The PSG will monitor DCD input for one minute. If DCD input does not become active within this time limit, then the PSG will assume that no remote modem exists at this location and it will abort the callback. If DCD input does become active, then the unit will assume that it is connected to the remote modem.

4.5.5 Ignoring an Incoming Call During a Callback Sequence

After the unit disconnects a call, but before it starts transmitting the dialing string to the modem, it will ignore RI input. It will not raise its DTR output to answer the call. After disconnecting the call, the unit will wait for the amount of time defined by Option Switch S3, positions 6 and 7, before transmitting the dialing string.

4.6 Lead Operation If a Port is Configured for Modem Control

The operation of the control leads in this configuration depends upon the mode the unit is in.

4.6.1 Outputs

Table 4-2 shows the output leads when the modem controls are enabled.

Table 4-2. Output Leads with Modem Controls Enabled (On: Active; Off: Inactive)

LEAD	SECURITY MODE PASSWORD VALIDATION	SECURITY MODE CALLBACK PROCEDURE	PASS-THRU MODE
RTS	Always ON OFF if DCD is not on in 1 minute (call aborted)	Always ON ON while transmitting dialing string and during 1-minute wait for DCD	Always ON
DTR	OFF when DCD goes from on to off (call terminated)	Stays ON if DCD comes up (call is answered by a modem) Goes OFF if DCD is not up in 1 minute (no modem answered, abort callback OFF if optioned secondary password is not entered correctly (disconnect call)	
	OFF on Reset	OFF for 3 seconds (disconnect call; give remote user and modem time to prepare for callback)	ON during entry to Pass-Thru Mode
	ON when RI is up (answer incoming call) For incoming call, RI must activate twice for DTR to be raised to the modem. Modem then answers the call after set number of rings.	Stay OFF if RI comes up (don't answer incoming calls during callback)	OFF during exit from from Pass-Thru Mode OFF when DCD goes off OFF when Exit command is received OFF if no activity timeout

4.6.2 Inputs

Table 4-3 shows the input leads when the modem controls are enabled.

Table 4-3. Input Leads with Modem Controls Enabled (On: Active; Off: Inactive)

LEAD	SECURITY MODE PASSWORD VALIDATION	SECURITY MODE CALLBACK PROCEDURE	PASS-THRU MODE
CTS	Ignored	Ignored	Ignored
DCD	ON = connected OFF = disconnected (restart Security Mode)	ON: modem answered; OFF: no modem answered (abort callback)	ON: connected OFF: disconnected (exit Pass-Thru Mode)
RI	Toggling ON: incoming call to answer; OFF: no incoming call	Toggling ON: incoming call to ignore	Ignored

NOTE: DCD has to be inactive for only 10 milliseconds to be considered off.

4.7 Sample Modem Configuration

Following is a sample modem configuration for the SD015A. We recommend that you disable the response codes from the modem.

ATC1 (DCD on while carrier is present)

ATD2 (DTR disconnects)

1. DCD on while carrier is present
2. DTR disconnects
3. Disable response codes from the modem

Here's a typical setup and application:

Port A: Modem: 1200 baud
8 data bits
no parity
1 stop bit
software flow

Port B: Computer: 1200 baud
8 data bits
no parity
1 stop bit
software flow

Switch S1

1	2	3	4	5	6	7	8
OFF	OFF	OFF	OFF	OFF	ON	ON	OFF

Port A: 1 Stop Bit
Parity Disabled
8 Data Bits
Software Flow Control
Modem Control Enabled
Program Mode Disabled

Switch S2

1	2	3	4	5	6	7	8
OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF

Port B: 1 Stop Bit
Parity Disabled
8 Data Bits
Software Flow Control
Modem Control Disabled
Program Mode Disabled

Switch S3

1	2	3	4	5	6	7	8
ON	OFF	OFF	ON	OFF	OFF	OFF	ON

Port A: 1200 Baud
5 Second Call-Back Delay
Status Messages Enabled

Switch S4

1	2	3	4	5	6	7	8
ON	OFF	OFF	ON	OFF	OFF	OFF	ON

Port B: 1200 Baud
Status Messages Disabled
RTS ON

Port A: RTS ON

Switch S5

1	2	3	4	5	6	7	8
OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF

Retry Count-1
30 second password timeout
30 second inactivity timeout

Switch S7

1	2	3	4	5	6	7	8
ON	ON	ON	OFF	OFF	OFF	OFF	OFF

Port A: RI Monitored
DTR Controlled
DCD Monitored
CTS Forced Active

Port B: RI Forced Inactive
DTR Forced Active
DCD Forced Active
CTS Forced Active

4.8 Security Considerations

To maintain security, follow these recommendations:

- Assign only one person the task of programming the unit.
- Store the PSG in a secured location to prevent an unauthorized user from reprogramming the unit.

  Without the password, an unauthorized user would have to read a copy of the user's manual to know that he can just remove the lid and toggle the Program Mode DIP switch to be able to reprogram the unit for future unauthorized access to your computer resources.
- Therefore, store the PSG user's manual in a secured location that is different from the secured location of the unit itself.
- If you program the unit with a "Program Mode" password, do not write this password down. Memorize the password only! Remember—if you forget the password, you can always reprogram the unit by removing the lid and toggling the Program Mode DIP switch.
- Inform everyone who receives a password to memorize it, and if necessary keep a written copy in a secured area.

	6	7	8
	OFF		
	ON		
		OFF	
		ON	
			OFF
			ON

	6	7	8
	OFF		
	ON		
		OFF	
		ON	
			OFF
			ON

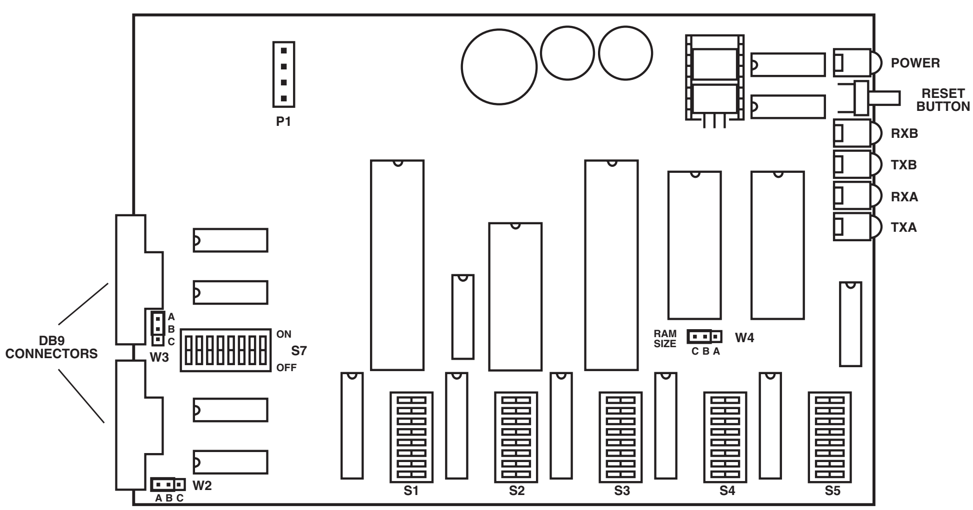
	6	7	8
	OFF		
	OFF		
	ON		
	ON		
		OFF	OFF

Switch S3 Port A

OPTION	SWITCH POSITION SETTING 1	2	3	4	5	6	7	8
BAUD RATE								
38400	OFF	OFF	OFF	OFF	OFF			
19200	ON	OFF	OFF	OFF	OFF			
9600	OFF	ON	OFF	OFF	OFF			
4800	ON	ON	OFF	OFF	OFF			
4800	OFF	OFF	ON	OFF	OFF			
2400	ON	OFF	ON	OFF	OFF			
2400	OFF	ON	ON	OFF	OFF			
1828.72	ON	ON	ON	OFF	OFF			
1371.54	OFF	OFF	OFF	ON	OFF			
1200	ON	OFF	OFF	ON	OFF			
1037.92	OFF	ON	OFF	ON	OFF			
600	ON	ON	OFF	ON	OFF			
300	OFF	OFF	ON	ON	OFF			
200	ON	OFF	ON	ON	OFF			
164.82	OFF	ON	ON	ON	OFF			
150	ON	ON	ON	ON	OFF			
1371.54	OFF	OFF	OFF	OFF	ON			
1200	ON	OFF	OFF	OFF	ON			
1037.92	OFF	ON	OFF	OFF	ON			
600	ON	ON	OFF	OFF	ON			
300	OFF	OFF	ON	OFF	ON			
200	ON	OFF	ON	OFF	ON			
164.82	OFF	ON	ON	OFF	ON			
150	ON	ON	ON	OFF	ON			
134.28	OFF	OFF	OFF	ON	ON			
110.35	ON	OFF	OFF	ON	ON			
100	OFF	ON	OFF	ON	ON			
74.42	ON	ON	OFF	ON	ON			
67.14	OFF	OFF	ON	ON	ON			
55.82	ON	OFF	ON	ON	ON			
50	OFF	ON	ON	ON	ON			
45.5	ON	ON	ON	ON	ON			
CALL BACK DELAY								
5 SECONDS						OFF	OFF	
10 SECONDS						ON	OFF	
20 SECONDS						OFF	ON	
30 SECONDS						ON	ON	
STATUS MESSAGES								
PORT A								
Disable								OFF
Enable								ON

Jumper Settings

FUNCTION	JUMPER POSITION
DSR OUTPUT (PORT A: FORCED ACTIVE)	W2 - BC
DSR OUTPUT (PORT A: NO CONNECTION)	W2 - AB
DSR OUTPUT (PORT B: FORCED ACTIVE)	W3 - BC
DSR OUTPUT (PORT B: NO CONNECTION)	W3 - AB



Programmable Security Guard Board Layout

Switch S4 Port B Baud Rate

OPTION	SWITCH P 1
BAUD RATE	
38400	OFF
19200	ON
9600	OFF
4800	ON
4800	OFF
2400	ON
2400	OFF
1828.72	ON
1371.54	OFF
1200	ON
1037.92	OFF
600	ON
300	OFF
200	ON
164.82	OFF
150	ON
1371.54	OFF
1200	ON
1037.92	OFF
600	ON
300	OFF
200	ON
164.82	OFF
150	ON
134.28	OFF
110.35	ON
100	OFF
74.42	ON
67.14	OFF
55.82	ON
50	OFF
45.5	ON
PASS DCD PORT A	
TO RTS PORT B	
RTS PORT B ON	
PASS-THRU	
PASS DCD PORT B	
TO RTS PORT A	
RTS PORT A ON	
PASS-THRU	
STATUS MESSAGES	
PORT B	
Disable	
Enable	

Switch S7

OPTION	SWITCH P 1
RI INPUT, PORT A	
Forced Inactive	OFF
Monitored	ON
DTR OUTPUT,	
PORT A	
Forced Active	
Controlled	
DCD INPUT, PORT A	
Forced Active	
Monitored	
CTS INPUT, PORT A	
Forced Active	
Monitored	
RI INPUT, PORT B	
Forced Inactive	
Monitored	
DTR OUTPUT, PORT B	
Forced Active	
Controlled	
DCD INPUT, PORT B	
Forced Active	
Monitored	
CTS INPUT, PORT B	
Forced Active	
Monitored	

IMPORTANT: The internal DIP s
CLOSED or ON and OFF. For a
CLOSED=ON.