

WTI Part No.: 12046  
Rev. D

# CAS-41A

Code Activated Switch



## User's Guide



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# 1. Introduction

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The CAS-41A Code Activated Switch allows you to control switching of up to four RS-232 ports, using ASCII commands sent from your PC via modem or cable.

The CAS-41A is ideal for situations where on-site personnel are not available to operate manually controlled mechanical data switches. Ports are connected or disconnected in response to simple ASCII commands sent to the CAS-41A; either from a remote PC via modem, or from a local PC via cable.

Up to sixteen different port combinations can be command selected, allowing the user to connect to no ports, any combination of ports, or all four ports. The CAS-41A also includes many other convenient features.

## **User-Programmable Prefix Code:**

The asynchronous, ASCII commands that are used to select ports consist of two components; the Prefix Code, and the Instruction Code. The Prefix Code, (or command identifier) can be redefined by configuring the Code Setup Switches located on the instrument back panel. This provides easy redefinition of the Prefix Code if the default prefix (^V) is incompatible with any of the components of your system.

## **Prefix Code Repetition:**

The Prefix Code Repetition function allows the unit to easily process print jobs, graphic files, and other types of data files which contain characters that might otherwise be interpreted as commands. The CAS-41A can be configured to require the Prefix Code to be entered once, twice, four times, or eight times in order for the next character to be recognized as a command. This greatly reduces the chance that characters in files will be incorrectly interpreted as commands.

## **Force Broadcast Feature:**

The Force Broadcast feature allows the user to simultaneously connect all four ports without the need to issue additional commands. When the Force Broadcast feature is enabled, all four ports will *always* be connected.

## **Force CTS and/or DCD High:**

The CAS-41A's Option Setup Switches can be used to force the CTS line and/or DCD line high.

## **Jumper Selectable Pin Monitoring:**

The CAS-41A features four jumpers that can be used to configure the unit to monitor either Pin 4 (RTS) or Pin 20 (factory setting) on each RS-232 port. The user may either select the same pin for all four ports, or select the monitor pin for each port individually.

Installation and operation of the CAS-41A is simple. CAS-41A's versatile design allows the unit to readily adapt to a wide variety of data switching applications. If you have questions or problems regarding your specific application, WTI Technical support can be reached at the address and phone numbers listed in Appendix D.

## Typographic Conventions

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Throughout the manual, typefaces and characters have been used to denote the following:

- ^** (e.g. **^E**)      Indicates a key combination that is used to invoke a command.  
For example, the text "**^V**" (Control V) indicates that the **[Ctrl]** key and the **[V]** key should be pressed simultaneously.
  
- COURIER FONT**      Indicates characters typed on the keyboard. For example, **^VS** or **^C#**.

## 2. Unit Description

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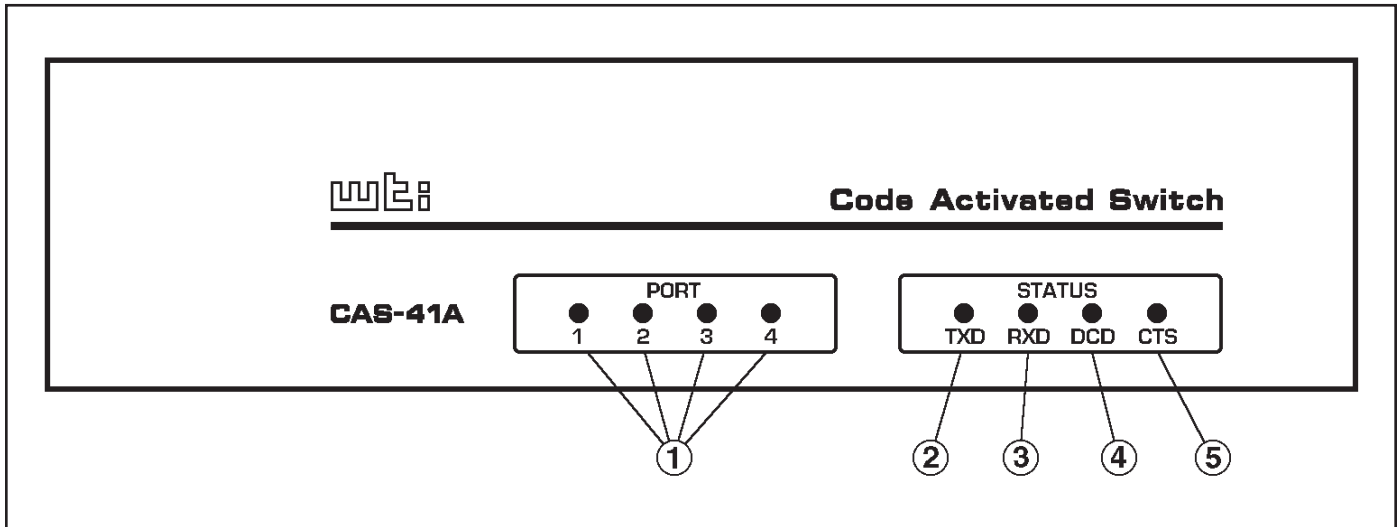


Figure 2.1: Front Panel Indicators

### 2.1. Front Panel Indicators

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- ① **Ports 1 - 4:** When lit, indicates that the associated port is currently connected to the Control Port.
- ② **TXD:** When lit, indicates data activity on the Control Port's Transmit Data Line (pin 2).
- ③ **RXD:** When lit, indicates data activity on the Control Port's Receive Data Line (pin 3).
- ④ **DCD:** Indicates the status of the Control Port's Data Carrier Detect signal (pin 8).
- ⑤ **CTS:** Indicates status of the Control Port's Clear-to-Send signal (pin 5).

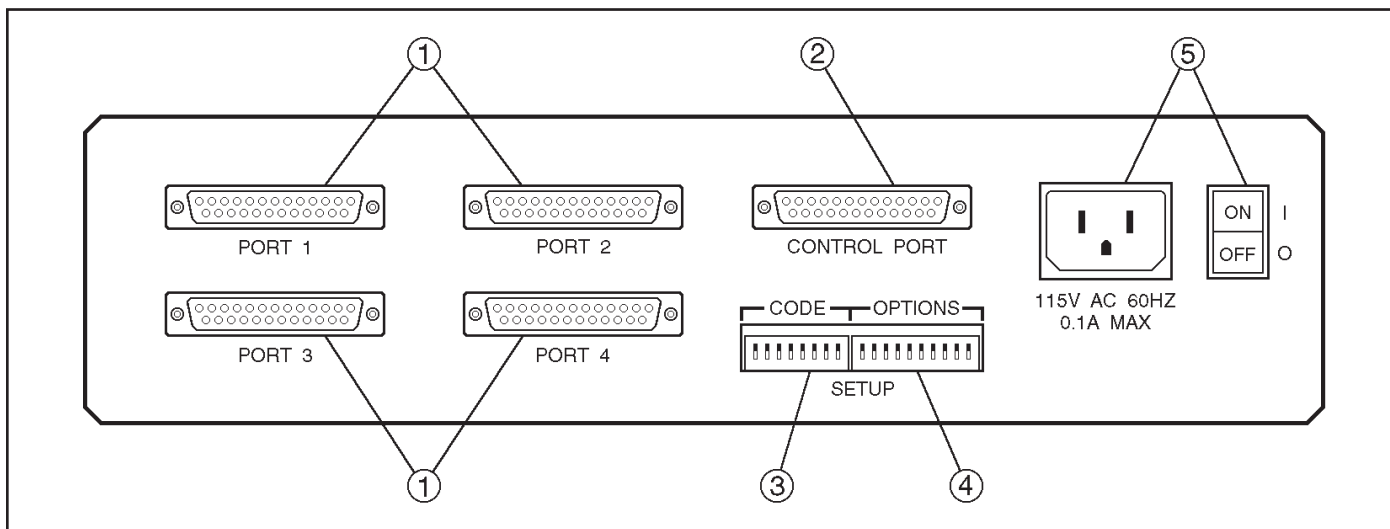


Figure 2.2: Back Panel

## 2.2. Back Panel

- ① **Ports 1 - 4:** These four ports are used to connect up to four data devices to the CAS-41A. Each port is an RS-232, DB-25 female connector configured for DTE input. Please refer to Appendix A for a description of the serial interface.
- ② **Control Port:** Used to connect a modem or PC to the CAS-41A. The Control Port is an RS-232, DB-25 female connector configured to DCE. Please refer to Appendix A for a description of the serial interface.
- ③ **Code Setup Switches:** A bank of eight dip switches that can be used to redefine the command Prefix Code.
- ④ **Option Setup Switches:** A bank of ten dip switches that are used to select Port Baud Rates, Prefix Code Repetition, enable/disable the Force Broadcast feature, and force CTS and/or DTE high.
- ⑤ **AC Power:** The AC power connector and the ON/OFF switch. The CAS-41A requires 115 VAC +10%, 60 Hz.

# 3. Installation

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## 3.1. Configure Dip Switches

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The CAS-41A back panel includes two banks of Dip Switches; the Code Setup Switches, and the Option Setup Switches.

### 3.1.1. Code Setup Switches

The Code Setup Switches are a bank of eight Dip Switches, that are used to define the Prefix Code and parity. Code Setup Switches 1 through 7 define the Prefix Code and Switch 8 defines its parity.

In order to connect or disconnect Ports, ASCII commands are sent to the CAS-41A via the Control Port. Each command consists of two components; the Prefix Code and the Instruction Code. The Prefix Code is a command identifier, which notifies the unit that the next character received will be an Instruction Code, rather than a data item. The Instruction Code defines the specific task that the CAS-41A will perform.

When a command is sent to the CAS-41A, the unit recognizes the Prefix Code, closes Ports 1 through 4, and then connects Ports as specified by the Instruction Code. After connecting the specified Ports, the Prefix Code is sent out through the Ports. The Instruction Code is not sent out.

When the CAS-41A is shipped from the factory, the Prefix Code is set at "^V" (SYN), and parity is set at 8 bits, none. If devices connected to the Ports recognize the ^V character as a command, it may be necessary to re-define the Prefix Code by setting the Code Setup Switches as described in the table on the following page. If the ^V character is compatible with your system, skip this section and proceed to Section 3.2.1.

**Note:** When selecting the Prefix Code, it is recommended to choose a non-printable character. This will prevent Prefix Codes sent out via connected port(s) from being included in print jobs.

U = Up    D = Down

Prefix Code (Name)	Code Setup Switch *									
	1	2	3	4	5	6	7	8**		
								E	O	N
^@ (NUL)	D	D	D	D	D	D	D	D	U	D
^A (SOH)	U	D	D	D	D	D	D	U	D	D
^B (STX)	D	U	D	D	D	D	D	U	D	D
^C (ETX)	U	U	D	D	D	D	D	D	U	D
^D (EOT)	D	D	U	D	D	D	D	U	D	D
^E (ENQ)	U	D	U	D	D	D	D	D	U	D
^F (ACK)	D	U	U	D	D	D	D	D	U	D
^G (BEL)	U	U	U	D	D	D	D	U	D	D
^H (BS)	D	D	D	U	D	D	D	U	D	D
^I (UL)	U	D	D	U	D	D	D	D	U	D
^J (LF)	D	U	D	U	D	D	D	D	U	D
^K (VT)	U	U	D	U	D	D	D	U	D	D
^L (FF)	D	D	U	U	D	D	D	D	U	D
^M (CR)	U	D	U	U	D	D	D	U	D	D
^N (SO)	D	U	U	U	D	D	D	U	D	D
^O (SI)	U	U	U	U	D	D	D	D	U	D
^P (DLE)	D	D	D	D	U	D	D	U	D	D
^Q (DC1)	U	D	D	D	U	D	D	D	U	D
^R (DC2)	D	U	D	D	U	D	D	D	U	D
^S (DC3)	U	U	D	D	U	D	D	U	D	D
^T (DC4)	D	D	U	D	U	D	D	D	U	D
^U (NAK)	U	D	U	D	U	D	D	U	D	D
^V (SYN)	D	U	U	D	U	D	D	U	D	D
^W (ETB)	U	U	U	D	U	D	D	D	U	D
^X (CAN)	D	D	D	U	U	D	D	D	U	D
^Y (EM)	U	D	D	U	U	D	D	U	D	D
^Z (SUB)	D	U	D	U	U	D	D	U	D	D
^[ (ESC)	U	U	D	U	U	D	D	D	U	D
^\ (FS)	D	D	U	U	U	D	D	U	D	D
^] (GS)	U	D	U	U	U	D	D	D	U	D
^^ (RS)	D	U	U	U	U	D	D	D	U	D
^_ (US)	U	U	U	U	U	D	D	U	D	D

\* Sw 1 through Sw 8 correspond with ASCII bits 1 through 8.

\*\* Sw8 is the Parity bit:

**E** = 7 bits, Even**O** = 7 bits, Odd**N** = 8 bits, None or 7 bits, Mark



### 3.1.2. Option Setup Switches

The Option Setup Switches are a bank of ten Dip Switches that are used to select port baud rates, Prefix Code Repetition, enable/disable the Force Broadcast function, and Force CTS and/or DCD positive.

#### 3.1.2.1. Port Baud Rates (Sw1, Sw2, and Sw3)

The first three Option Setup Switches are used to select port baud rates as described in the table below.

\* = Factory Setting

**U** = Up

**D** = Down

Baud	Option Setup Switch		
	Sw1	Sw2	Sw3
19.2K	<b>U</b>	<b>U</b>	<b>U</b>
9600 *	<b>D</b>	<b>U</b>	<b>U</b>
4800	<b>U</b>	<b>D</b>	<b>U</b>
2400	<b>D</b>	<b>D</b>	<b>U</b>
1200	<b>U</b>	<b>U</b>	<b>D</b>
600	<b>D</b>	<b>U</b>	<b>D</b>
300	<b>U</b>	<b>D</b>	<b>D</b>
150	<b>D</b>	<b>D</b>	<b>D</b>

#### 3.1.2.2. Prefix Code Repetition (Sw4, Sw5, Sw6, and Sw7)

Option Setup Switches 4 through 7 are used to select the repetition value for the Prefix Code. This repetition value determines the number of consecutive Prefix Code characters that must be sent to the CAS-41A prior to sending an instruction to connect or disconnect a Port.

If printers or other output devices are connected to the unit, the selected Prefix Code may occasionally be present in graphics files that are sent through the CAS-41A. In order to prevent characters in graphics files from being interpreted as commands, the Prefix Code Repetition feature can be used to require a series of identical Prefix Code characters.

For example, when the Prefix Code Repetition value is set at 1, the default Prefix Code is ^V. If the Prefix Code Repetition value is set at 4, the default Prefix Code is ^V^V^V^V.

The table below shows the Option Setup Switch configuration used to select the various Prefix Code Repetition values.

\* = Factory Setting

**U** = Up

**D** = Down

Prefix Code Repetition	Option Setup Switch			
	Sw4	Sw5	Sw6	Sw7
1 *	<b>D</b>	<b>U</b>	<b>U</b>	<b>U</b>
2	<b>U</b>	<b>D</b>	<b>U</b>	<b>U</b>
4	<b>U</b>	<b>U</b>	<b>D</b>	<b>U</b>
8	<b>U</b>	<b>U</b>	<b>U</b>	<b>D</b>

### 3.1.2.3. Force Broadcast (Sw8)

When the Force Broadcast feature is enabled, data sent to the Control Port will be distributed to all four ports, without the need to first send a command to select the ports. In other words, when this feature is enabled, all four ports will always be connected to the Control Port.

Note that when the Force Broadcast feature is enabled, ASCII port connection commands will have no effect. The table below shows the setup switch configuration for the Force Broadcast feature.

\* = Factory Setting

**U** = Up

**D** = Down

Force Broadcast Feature	Option Setup Switch Sw8
Enable	<b>U</b>
Disable *	<b>D</b>

### 3.1.2.4. Force CTS and/or DCD High (Sw9 and Sw10)

The table below shows the setup switch configuration for these options.

\* = Factory Setting

**U** = Up

**D** = Down

Option Setup Switch	Function	Enable	Disable *
Sw9	Force CTS High	<b>D</b>	<b>U</b>
Sw10	Force DCD High	<b>D</b>	<b>U</b>

## 3.2. Connect Power Cable

Make certain that the CAS-41A power switch is in the OFF position and then connect the power cable to the AC Power connector. Connect the other end of the power cable to an appropriate grounded AC wall outlet.

## 3.3. Connect Data Cables

**Note:** Make certain that all data cables are compatible with the CAS-41A port interface. Please refer to Appendix A for a description of the port interface.

1. Make certain that the CAS-41A power switch is set in the OFF position.
2. Connect data cables from the desired devices to Ports 1 through 4.
3. Connect the data cable from your Modem or PC to the CAS-41A's Control Port.

## 4. Operation

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In order to connect output ports, commands are sent to the CAS-41A via the Control Port. As mentioned previously, each command consists of two components; the Prefix Code (see Section 3) and the Instruction Code. This Section describes the procedure for using Instruction Codes to select the CAS-41A's sixteen possible port combinations.

### 4.1. Port Selection

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The Instruction Code follows the Prefix Code and tells the CAS-41A to connect one or more of the unit's four output ports.

The chart on the following page describes 64 possible Instruction Codes that can be used to select sixteen possible port combinations. Note that each port combination can be selected by any of the four characters listed for that combination. For example, in order to connect Port 1, the Instruction code could be !, 1, A, or Q.

When sending commands to the CAS-41A, note the following:

- The Prefix Code selected by the current Code Setup Switch configuration must be sent *before* each Instruction Code.
- Bits 1, 2, 3 and 4 of the Instruction Code correspond to output ports 1, 2, 3 and 4.
- The Instruction Code is not sent out through the ports.
- The next character received after the Instruction Code is sent out through the selected ports.
- Non-printable characters cannot be used as Instruction Codes.

Connected Ports				Possible Instruction Codes			
1	2	3	4				
				Space	0	@	P
X				!	1	A	Q
	X			"	2	B	R
X	X			#	3	C	S
		X		\$	4	D	T
X		X		%	5	E	U
	X	X		&	6	F	V
X	X	X		'	7	G	W
			X	(	8	H	X
X			X	)	9	I	Y
	X		X	*	:	J	Z
X	X		X	+	;	K	[
		X	X	,	<	L	\
X		X	X	-	=	M	]
	X	X	X	.	>	N	^
X	X	X	X	/	?	O	_

## 4.2. Port Selection Examples

Each of the following examples lists a Prefix Code, Prefix Code Repetition value, the desired port connection, and all possible Instruction Codes that could be used to perform the port connection.

### Example 1:

Selected Prefix Code:            ^V (SYN) - Default  
 Prefix Code Repetition Value:   1 (Option Setup Sw4 = Down)  
 Connect Ports:                    Port 1  
 Possible Instruction Codes:      !, 1, A, Q  
 Possible Commands:              ^V!  
                                       ^V1  
                                       ^VA  
                                       ^VQ

### Example 2:

Selected Prefix Code:            ^V (SYN) - Default  
 Prefix Code Repetition Value:   4 (Option Setup Sw6 = Down)  
 Connect Ports:                    Ports 1, 2, 3, and 4  
 Possible Instruction Codes:      /, ?, O, \_  
 Possible Commands:              ^V^V^V^V/  
                                       ^V^V^V^V?  
                                       ^V^V^V^VO  
                                       ^V^V^V^V\_

### Example 3:

Selected Prefix Code:            ^C (ETX) - Default  
 Prefix Code Repetition Value:   8 (Option Setup Sw7 = Down)  
 Connect Ports:                    Ports 1, 2, 3, and 4  
 Possible Instruction Codes:      /, ?, O, \_  
 Possible Commands:              ^C^C^C^C^C^C^C^C/  
                                       ^C^C^C^C^C^C^C^C?  
                                       ^C^C^C^C^C^C^C^CO  
                                       ^C^C^C^C^C^C^C^C\_

### 4.3. Changing Monitor Pins

The four internal jumpers located on the CAS-41A circuit board can be used to switch the CAS-41A to monitor pin 4 (Request to Send) instead of pin 20 (factory setting). To switch monitor pins, proceed as follows:

**CAUTION:** Make certain to power off the CAS-41A and disconnect the power cable *before* attempting to remove the instrument cover.

1. Switch off power to the CAS-41A and disconnect the AC power cable from the power source.
2. Remove the four screws that secure the CAS-41A's plastic cover to the chassis. Remove the cover from the chassis.
3. Locate the jumpers on the CAS-41A circuit board. As you face the instrument back panel, the jumpers are located in the lower left hand corner of the circuit board. Figure 4.1 describes the jumper settings for selecting Pin 4 or Pin 20.
4. Replace the plastic cover on the CAS-41A chassis. Reinstall the four screws that secure the cover to the chassis. Reconnect the power cable and switch the power on.

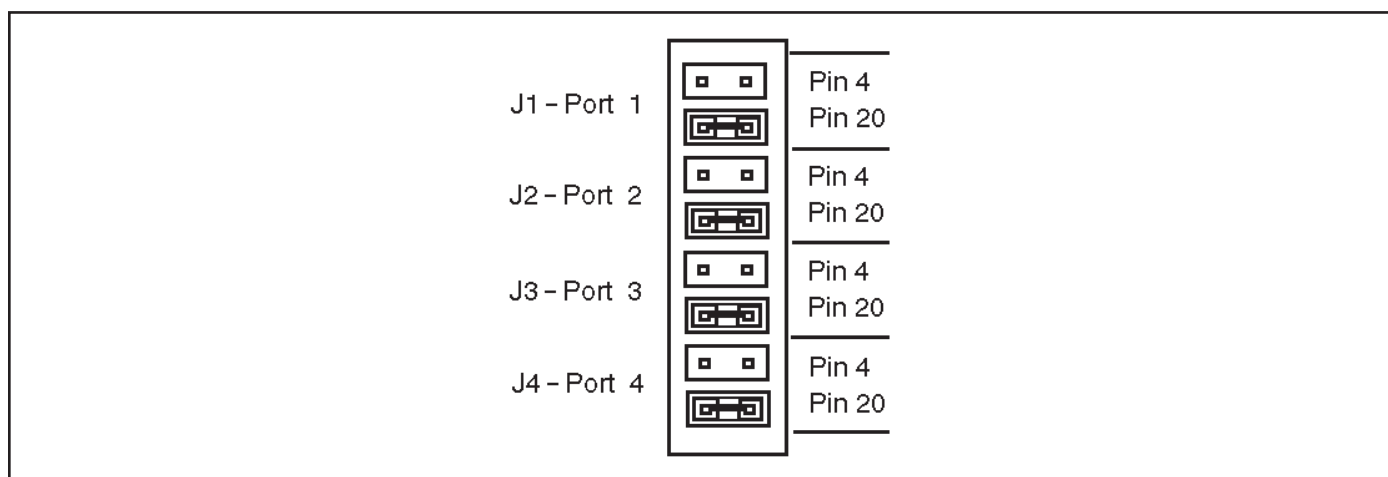


Figure 4.1: Jumper Positions for Pin Selection

# A. Serial Interface

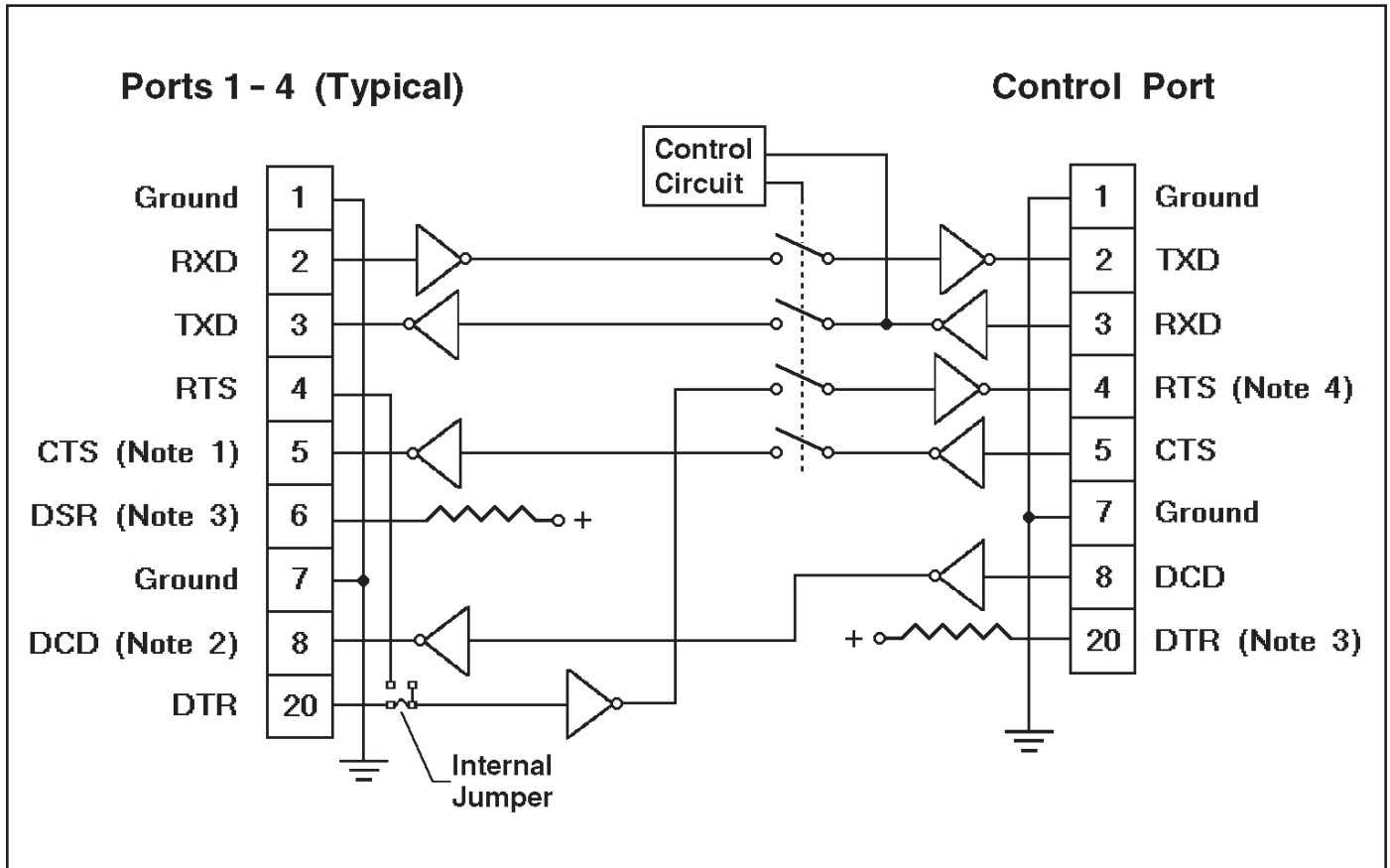


Figure A.1: CAS-41A Serial Interface Block Diagram

## Notes:

1. To force the CTS line high, place Option Setup Switch 9 in the Down position as described in Section 3.1.2.4.
2. To force the DCD line high, place Option Setup Switch 10 in the Down position as described in Section 3.1.2.4.
3. Always high; supplied by CAS-41A.
4. Control Port pin 4 follows pins 4 or 20 of the selected port. See Section 4.3 for instructions on selecting pin 4 or 20.

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## B. Specifications

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<b>Coding:</b>	USAASCII, Asynchronous
<b>Parity:</b>	Odd, Even, None
<b>Baud Rate:</b>	150, 300, 600, 1200, 2400, 4800, 9600, 19,200
<b>Interface:</b>	Four female RS-232C, 25-pin DCE inputs One female RS-232C, 25-pin DTE output
<b>Lines Switched:</b>	2, 3, 5, 20
<b>Set-Up:</b>	External Dip switches for prefix code, baud rate, and other setup options. Internal jumpers allow selection of monitoring pins 4 or 20.
<b>Power:</b>	115 VAC, 60 Hz +10%, 10 watts 230 VAC, 50 Hz + 10%, 10 watts
<b>Size:</b>	10.5" x 3.0" x 6.5" (W x H x D)
<b>Weight:</b>	3 lbs.

## C. FCC Statement

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

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the equipment with respect to the receiver.
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that the equipment and receiver are on different branch outlets.
- Ensure that the mounting screws, attachment connector screws and ground wires are tightly secured.
- Ensure that good quality, shielded and grounded cables are used for data transmission.

You may find the following booklet prepared by the Federal Communications Commission helpful:

*How to Identify and Resolve Radio-TV Interference Problems*

This booklet is available from the US Government Printing Office, Washington, DC 20402, Stock No. 044-000-00345-4.



## D. Customer Service

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Customer Service hours are 8:00 AM to 5:00 PM, Pacific Time, Monday through Friday. When calling, please be prepared to give the name and make of the unit, its serial number, and a description of its symptoms. If the unit should need to be returned for factory repair it must be accompanied by a Return Authorization number from Customer Service.

WTI Customer Service  
5 Sterling  
Irvine, California 92618

949-586-9950  
Toll Free: 1-800-854-7226  
Email: [service@wti.com](mailto:service@wti.com)

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