Black Box Corporation

The World's Source for Connectivity™

© Copyright 1998. Black Box Corporation. All rights reserved.

1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746

FEDERAL COMMUNICATIONS COMMISSION AND CANADIAN DEPARTMENT OF COMMUNICATIONS RADIO FREQUENCY INTERFERENCE STATEMENTS

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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 the Canadian Department of Communications.

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 le ministère des Communications du Canada.

TRADEMARKS USED IN THIS MANUAL

AT, IBM, and PS/2 are registered trademarks, and PC/XT is a trademark, of International Business Machines Corporation.

NORMAS OFICIALES MEXICANAS (NOM) ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

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

1. Specifications

Compliance — FCC Class A, DOC Class/MDC classe A

Interface — EIA RS-232 serial; each port either DTE or DCE (user-selectable)

Protocol — Asynchronous

Data Format — Either 7 data bits with odd or even parity or 8 data bits with no parity (user-selectable); always 1 stop bit

Flow Control — Hardware (DTR/CTS), passed through (see pages 21 and 23)

Data Rates — 115,200, 57,600, 38,400, 19,200, 9600, 2400, 1200, and 600 bps (user-selectable)

Maximum Distances — 50 ft. (15.2 m) to each connected device

User Controls — (2) Front-mounted: (1) Slide switch for switching mode (text, graphics, or transparent); (1) Reset pushbutton;
(6) or (10) Internal: (2) 8-position DIP switches for arming code and communication parameters;
(5) or (9) DTE/DCE slide switches: (1) for the common port, (1) for each switched port

Diagnostic — Automatic power-up self-test and user-selectable power-up barber-pole test

Indicators — (2) Front-mounted LEDs: (1) POWER, (1) [Operating] MODE (only lit during Transparent mode);
(1) Front-mounted 7-segment PORT LED display

HIGH SPEED COS-4 AND HIGH SPEED COS-8

Connectors — SW282 models: (5) DB25 female: (4) switched, (1) common;
SW283 models: (9) DB25 female: (8) switched, (1) common

Leads/Signals Supported — Pins 1, 2, 3, 5, 7, and 20 (PGND, TD, RD, CTS, SGND, and DTR respectively); all but Pin 1 (PGND) are switched

Power — SW282A, SW283A:
From wallmount power supply PS113:
Input: 115 VAC, 60 Hz;
Output: 5 VDC, 600 mA;
SW282AE, SW283AE:
From desktop power supply PS112E:
Input: 230 VAC, 50 Hz;
Output: 5 VDC, 600 mA

MTBF — Greater than 48,000 hours

Altitude Tolerance — 15,000 ft. (4572 m)

Temperature Tolerance — Operating: 32 to 104° F (0 to 40° C);
Storage: –4 to 158° F (–20 to 70° C)

Humidity Tolerance — 10 to 90% noncondensing

Size — 2.5"H x 12.5"W x 8.3"D (6.4 x 31.8 x 21 cm)

Weight — 3.5 lb. (1.6 kg)

2. Introduction

With the High Speed COS-4 or High Speed COS-8, you can send a code sequence from an asynchronous RS-232 device and switch between four or eight other such devices. By using this electronic method to switch, you avoid the problems that can occur (especially with laser printers) when you switch manually. You can select any two-byte sequence as the "arming code" (the code that causes the COS to switch).

The High Speed COS-4 and COS-8 have three modes of operation, which you can choose between with the slide switch on the front panel. In Text mode, the user can send the chosen arming code, followed by the ASCII character corresponding to the desired port (from "1" to "4" or "8," or "0" for no port, or "9" for all ports), immediately following other data. In Graphics mode, the arming code and port character are not recognized unless they are preceded by a pause. (You can select the length of this pause.) In Transparent mode, arming codes are not recognized and switching does not occur; arming codes will be passed through the COS until it is set to a different mode.

3. Configuration

Before you install the High Speed COS-4 or High Speed COS-8, you should configure it for your application. **Section 3.1** describes setting the front-panel Mode switch to select your desired operating mode. **Section 3.2** describes setting the internal DIP switch SW1 so that the COS operates using the communication parameters that you need; **Section 3.3** describes how to choose your arming code by setting the internal DIP switch SW2; **Section 3.4** describes how to use the internal slide switches to set each port as DTE or DCE.

3.1 Selecting the Operating Mode

Use the slide switch labeled "TX GR TR" on the front of the High-Speed COS-4 or COS-8 to select which operating mode you want the unit to start in. In the left-hand (TX) position, the Text mode is selected; in the center (GR) position, the Graphics mode is selected; in the right-hand (TR) position, the Transparent mode is selected. In Text and Graphics modes, the MODE LED is dark; in Transparent mode, the MODE LED is lit to alert you that switching is diabled until you change modes. (See **Chapter 2** and **Section 5.2** for descriptions of these modes.)

3.2 Setting Communication Parameters

Making sure that the unit is unplugged and powered down, open the High Speed COS-4 or COS-8 by unscrewing and removing six screws (three on the left side of the unit, three on the right side), then removing the unit's cover. Use the DIP switch labeled SW11 inside the unit to set its communications parameters. As shown in Table 3-1 on page 12, positions 1 through 3 control the data rate; positions 4 and 5 control the data format; and positions 7 and 8 control the graphics-mode pause. (Use position 6 for troubleshooting, when you want the COS to run its barber-pole self-test.) For first-time configuration, leave the case open to choose the arming code (see the next section) and set your ports for DTE or DCE (see **Section 3.4**).

3.3 Choosing the Arming Code

Use the DIP switch labeled SW12 inside the High-Speed COS-4 or COS-8 to set the COS's "arming code" (the character that alerts the COS to an impending switch). As shown in Table 3-2 on pages 13 through 19, each possible setting of the eight DIP switch positions corresponds to a one-byte character value from 00 to FF hex (0 to 255 decimal). For first-time configuration, leave the case open to set your ports for DTE or DCE (see the next section).

3.4 Setting Ports as DTE or DCE

Decide which devices you're going to connect to which of the High Speed COS-4's or COS-8's ports. Then set the DTE/DCE slide switches inside the unit (there's one just behind every port) so that you can use standard, straight-through-pinned cables to attach the devices to the ports: If a device is a DTE, set the port as DCE (move the switch to the B position); if a device is a DCE, set the port as DTE (move the switch to the A position). Once you've finished, replace the COS's cover and secure it by screwing the screws back in.

*(**Chapter 4**, **Installation**, begins on page 20)*

Table 3-1. Possible Settings of the Communications DIP Switch*

FUNCTION	DIP SWITCH POSITIONS							
	1	2	3	4	5	6	7	8
Data Rate (bps)								
115,200	OFF	OFF	OFF					
57,600	ON	OFF	OFF					
38,400	OFF	ON	OFF					
19,200†	ON	ON	OFF					
9600	OFF	OFF	ON					
2400	ON	OFF	ON					
1200	OFF	ON	ON					
600	ON	ON	ON					
Data Format								
8 data bits, no parity†				OFF	OFF			
8 data bits, no parity				ON	OFF			
7 data bits, odd parity				OFF	ON			
7 data bits, even parity				ON	ON			
Operating Mode								
Normal†						OFF		
Self-Test						ON		
Pause for Graphics Mode								
1 millisecond†							OFF	OFF
10 milliseconds							ON	OFF
100 milliseconds							OFF	ON
500 milliseconds							ON	ON

*A switch position is ON when it is up (closer to the number that identifies it).

†Default setting.

Table 3-2. Possible Settings of the Arming-Code DIP Switch*

ARMING CODE			DIP SWITCH POSITIONS							
HEX	ASCII	NAME	1	2	3	4	5	6	7	8
00	CTRL-@	NUL	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
01	CTRL-A	SOH	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
02	CTRL-B	STX	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
03	CTRL-C	ETX	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
04†	CTRL-D	EOT	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
05	CTRL-E	ENQ	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
06	CTRL-F	ACK	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
07	CTRL-G	BEL	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
08	CTRL-H	BS	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
09	CTRL-I	HT	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
0A	CTRL-J	LF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
0B	CTRL-K	VT	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
0C	CTRL-L	FF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
0D	CTRL-M	CR	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
0E	CTRL-N	SO	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
0F	CTRL-O	SI	ON	ON	ON	ON	OFF	OFF	OFF	OFF
10	CTRL-P	DLE	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
11	CTRL-Q	DC1	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
12	CTRL-R	DC2	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
13	CTRL-S	DC3	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
14	CTRL-T	DC4	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
15	CTRL-U	NAK	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
16	CTRL-V	SYN	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
17	CTRL-W	ETB	ON	ON	ON	OFF	ON	OFF	OFF	OFF
18	CTRL-X	CAN	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
19	CTRL-Y	EM	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
1A	CTRL-Z	SUB	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
1B	CTRL-[	ESC	ON	ON	OFF	ON	ON	OFF	OFF	OFF
1C	CTRL-\	FS	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
1D	CTRL-]	GS	ON	OFF	ON	ON	ON	OFF	OFF	OFF
1E	CTRL-^	RS	OFF	ON	ON	ON	ON	OFF	OFF	OFF
1F	CTRL-_	US	ON	ON	ON	ON	ON	OFF	OFF	OFF
20	space	SP	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF

*A switch position is ON when it is up (closer to the number that identifies it).

†Default setting.

HIGH SPEED COS-4 AND HIGH SPEED COS-8

ARMING CODE		DIP SWITCH POSITIONS							
HEX	ASCII	1	2	3	4	5	6	7	8
21	!	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
22	"	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
23	#	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
24	$	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
25	%	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
26	&	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
27	'	ON	ON	ON	OFF	OFF	ON	OFF	OFF
28	(	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
29	)	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
2A	*	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
2B	+	ON	ON	OFF	ON	OFF	ON	OFF	OFF
2C	,	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
2D	-	ON	OFF	ON	ON	OFF	ON	OFF	OFF
2E	.	OFF	ON	ON	ON	OFF	ON	OFF	OFF
2F	/	ON	ON	ON	ON	OFF	ON	OFF	OFF
30	0	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
31	1	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
32	2	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
33	3	ON	ON	OFF	OFF	ON	ON	OFF	OFF
34	4	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
35	5	ON	OFF	ON	OFF	ON	ON	OFF	OFF
36	6	OFF	ON	ON	OFF	ON	ON	OFF	OFF
37	7	ON	ON	ON	OFF	ON	ON	OFF	OFF
38	8	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
39	9	ON	OFF	OFF	ON	ON	ON	OFF	OFF
3A	:	OFF	ON	OFF	ON	ON	ON	OFF	OFF
3B	;	ON	ON	OFF	ON	ON	ON	OFF	OFF
3C	<	OFF	OFF	ON	ON	ON	ON	OFF	OFF
3D	=	ON	OFF	ON	ON	ON	ON	OFF	OFF
3E	>	OFF	ON	ON	ON	ON	ON	OFF	OFF
3F	?	ON	ON	ON	ON	ON	ON	OFF	OFF
40	@	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
41	A	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
42	B	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
43	C	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
44	D	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
45	E	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
46	F	OFF	ON	ON	OFF	OFF	OFF	ON	OFF
47	G	ON	ON	ON	OFF	OFF	OFF	ON	OFF

ARMING CODE		DIP SWITCH POSITIONS							
HEX	ASCII	1	2	3	4	5	6	7	8
48	H	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF
49	I	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
4A	J	OFF	ON	OFF	ON	OFF	OFF	ON	OFF
4B	K	ON	ON	OFF	ON	OFF	OFF	ON	OFF
4C	L	OFF	OFF	ON	ON	OFF	OFF	ON	OFF
4D	M	ON	OFF	ON	ON	OFF	OFF	ON	OFF
4E	N	OFF	ON	ON	ON	OFF	OFF	ON	OFF
4F	O	ON	ON	ON	ON	OFF	OFF	ON	OFF
50	P	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
51	Q	ON	OFF	OFF	OFF	ON	OFF	ON	OFF
52	R	OFF	ON	OFF	OFF	ON	OFF	ON	OFF
53	S	ON	ON	OFF	OFF	ON	OFF	ON	OFF
54	T	OFF	OFF	ON	OFF	ON	OFF	ON	OFF
55	U	ON	OFF	ON	OFF	ON	OFF	ON	OFF
56	V	OFF	ON	ON	OFF	ON	OFF	ON	OFF
57	W	ON	ON	ON	OFF	ON	OFF	ON	OFF
58	X	OFF	OFF	OFF	ON	ON	OFF	ON	OFF
59	Y	ON	OFF	OFF	ON	ON	OFF	ON	OFF
5A	Z	OFF	ON	OFF	ON	ON	OFF	ON	OFF
5B	[	ON	ON	OFF	ON	ON	OFF	ON	OFF
5C	\	OFF	OFF	ON	ON	ON	OFF	ON	OFF
5D	]	ON	OFF	ON	ON	ON	OFF	ON	OFF
5E	^	OFF	ON	ON	ON	ON	OFF	ON	OFF
5F	_	ON	ON	ON	ON	ON	OFF	ON	OFF
60	`	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF
61	a	ON	OFF	OFF	OFF	OFF	ON	ON	OFF
62	b	OFF	ON	OFF	OFF	OFF	ON	ON	OFF
63	c	ON	ON	OFF	OFF	OFF	ON	ON	OFF
64	d	OFF	OFF	ON	OFF	OFF	ON	ON	OFF
65	e	ON	OFF	ON	OFF	OFF	ON	ON	OFF
66	f	OFF	ON	ON	OFF	OFF	ON	ON	OFF
67	g	ON	ON	ON	OFF	OFF	ON	ON	OFF
68	h	OFF	OFF	OFF	ON	OFF	ON	ON	OFF
69	i	ON	OFF	OFF	ON	OFF	ON	ON	OFF
6A	j	OFF	ON	OFF	ON	OFF	ON	ON	OFF
6B	k	ON	ON	OFF	ON	OFF	ON	ON	OFF
6C	l	OFF	OFF	ON	ON	OFF	ON	ON	OFF
6D	m	ON	OFF	ON	ON	OFF	ON	ON	OFF
6E	n	OFF	ON	ON	ON	OFF	ON	ON	OFF

HIGH SPEED COS-4 AND HIGH SPEED COS-8

ARMING CODE		DIP SWITCH POSITIONS							
HEX	**ASCII**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
6F	o	ON	ON	ON	ON	OFF	ON	ON	OFF
70	p	OFF	OFF	OFF	OFF	ON	ON	ON	OFF
71	q	ON	OFF	OFF	OFF	ON	ON	ON	OFF
72	r	OFF	ON	OFF	OFF	ON	ON	ON	OFF
73	s	ON	ON	OFF	OFF	ON	ON	ON	OFF
74	t	OFF	OFF	ON	OFF	ON	ON	ON	OFF
75	u	ON	OFF	ON	OFF	ON	ON	ON	OFF
76	v	OFF	ON	ON	OFF	ON	ON	ON	OFF
77	w	ON	ON	ON	OFF	ON	ON	ON	OFF
78	x	OFF	OFF	OFF	ON	ON	ON	ON	OFF
79	y	ON	OFF	OFF	ON	ON	ON	ON	OFF
7A	z	OFF	ON	OFF	ON	ON	ON	ON	OFF
7B	{	ON	ON	OFF	ON	ON	ON	ON	OFF
7C	l	OFF	OFF	ON	ON	ON	ON	ON	OFF
7D	}	ON	OFF	ON	ON	ON	ON	ON	OFF
7E	~	OFF	ON	ON	ON	ON	ON	ON	OFF
7F	DEL	ON	ON	ON	ON	ON	ON	ON	OFF
80		OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
81		ON	OFF	OFF	OFF	OFF	OFF	OFF	ON
82		OFF	ON	OFF	OFF	OFF	OFF	OFF	ON
83		ON	ON	OFF	OFF	OFF	OFF	OFF	ON
84		OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
85		ON	OFF	ON	OFF	OFF	OFF	OFF	ON
86		OFF	ON	ON	OFF	OFF	OFF	OFF	ON
87		ON	ON	ON	OFF	OFF	OFF	OFF	ON
88		OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
89		ON	OFF	OFF	ON	OFF	OFF	OFF	ON
8A		OFF	ON	OFF	ON	OFF	OFF	OFF	ON
8B		ON	ON	OFF	ON	OFF	OFF	OFF	ON
8C		OFF	OFF	ON	ON	OFF	OFF	OFF	ON
8D		ON	OFF	ON	ON	OFF	OFF	OFF	ON
8E		OFF	ON	ON	ON	OFF	OFF	OFF	ON
8F		ON	ON	ON	ON	OFF	OFF	OFF	ON
90		OFF	OFF	OFF	OFF	ON	OFF	OFF	ON
91		ON	OFF	OFF	OFF	ON	OFF	OFF	ON
92		OFF	ON	OFF	OFF	ON	OFF	OFF	ON
93		ON	ON	OFF	OFF	ON	OFF	OFF	ON
94		OFF	OFF	ON	OFF	ON	OFF	OFF	ON
95		ON	OFF	ON	OFF	ON	OFF	OFF	ON

ARMING CODE		DIP SWITCH POSITIONS							
HEX	ASCII	1	2	3	4	5	6	7	8
96		OFF	ON	ON	OFF	ON	OFF	OFF	ON
97		ON	ON	ON	OFF	ON	OFF	OFF	ON
98		OFF	OFF	OFF	ON	ON	OFF	OFF	ON
99		ON	OFF	OFF	ON	ON	OFF	OFF	ON
9A		OFF	ON	OFF	ON	ON	OFF	OFF	ON
9B		ON	ON	OFF	ON	ON	OFF	OFF	ON
9C		OFF	OFF	ON	ON	ON	OFF	OFF	ON
9D		ON	OFF	ON	ON	ON	OFF	OFF	ON
9E		OFF	ON	ON	ON	ON	OFF	OFF	ON
9F		ON	ON	ON	ON	ON	OFF	OFF	ON
A0		OFF	OFF	OFF	OFF	OFF	ON	OFF	ON
A1		ON	OFF	OFF	OFF	OFF	ON	OFF	ON
A2		OFF	ON	OFF	OFF	OFF	ON	OFF	ON
A3		ON	ON	OFF	OFF	OFF	ON	OFF	ON
A4		OFF	OFF	ON	OFF	OFF	ON	OFF	ON
A5		ON	OFF	ON	OFF	OFF	ON	OFF	ON
A6		OFF	ON	ON	OFF	OFF	ON	OFF	ON
A7		ON	ON	ON	OFF	OFF	ON	OFF	ON
A8		OFF	OFF	OFF	ON	OFF	ON	OFF	ON
A9		ON	OFF	OFF	ON	OFF	ON	OFF	ON
AA		OFF	ON	OFF	ON	OFF	ON	OFF	ON
AB		ON	ON	OFF	ON	OFF	ON	OFF	ON
AC		OFF	OFF	ON	ON	OFF	ON	OFF	ON
AD		ON	OFF	ON	ON	OFF	ON	OFF	ON
AE		OFF	ON	ON	ON	OFF	ON	OFF	ON
AF		ON	ON	ON	ON	OFF	ON	OFF	ON
B0		OFF	OFF	OFF	OFF	ON	ON	OFF	ON
B1		ON	OFF	OFF	OFF	ON	ON	OFF	ON
B2		OFF	ON	OFF	OFF	ON	ON	OFF	ON
B3		ON	ON	OFF	OFF	ON	ON	OFF	ON
B4		OFF	OFF	ON	OFF	ON	ON	OFF	ON
B5		ON	OFF	ON	OFF	ON	ON	OFF	ON
B6		OFF	ON	ON	OFF	ON	ON	OFF	ON
B7		ON	ON	ON	OFF	ON	ON	OFF	ON
B8		OFF	OFF	OFF	ON	ON	ON	OFF	ON
B9		ON	OFF	OFF	ON	ON	ON	OFF	ON
BA		OFF	ON	OFF	ON	ON	ON	OFF	ON
BB		ON	ON	OFF	ON	ON	ON	OFF	ON
BC		OFF	OFF	ON	ON	ON	ON	OFF	ON

HIGH SPEED COS-4 AND HIGH SPEED COS-8

ARMING CODE		DIP SWITCH POSITIONS							
HEX	ASCII	1	2	3	4	5	6	7	8
BD		ON	OFF	ON	ON	ON	ON	OFF	ON
BE		OFF	ON	ON	ON	ON	ON	OFF	ON
BF		ON	ON	ON	ON	ON	ON	OFF	ON
C0		OFF	OFF	OFF	OFF	OFF	OFF	ON	ON
C1		ON	OFF	OFF	OFF	OFF	OFF	ON	ON
C2		OFF	ON	OFF	OFF	OFF	OFF	ON	ON
C3		ON	ON	OFF	OFF	OFF	OFF	ON	ON
C4		OFF	OFF	ON	OFF	OFF	OFF	ON	ON
C5		ON	OFF	ON	OFF	OFF	OFF	ON	ON
C6		OFF	ON	ON	OFF	OFF	OFF	ON	ON
C7		ON	ON	ON	OFF	OFF	OFF	ON	ON
C8		OFF	OFF	OFF	ON	OFF	OFF	ON	ON
C9		ON	OFF	OFF	ON	OFF	OFF	ON	ON
CA		OFF	ON	OFF	ON	OFF	OFF	ON	ON
CB		ON	ON	OFF	ON	OFF	OFF	ON	ON
CC		OFF	OFF	ON	ON	OFF	OFF	ON	ON
CD		ON	OFF	ON	ON	OFF	OFF	ON	ON
CE		OFF	ON	ON	ON	OFF	OFF	ON	ON
CF		ON	ON	ON	ON	OFF	OFF	ON	ON
D0		OFF	OFF	OFF	OFF	ON	OFF	ON	ON
D1		ON	OFF	OFF	OFF	ON	OFF	ON	ON
D2		OFF	ON	OFF	OFF	ON	OFF	ON	ON
D3		ON	ON	OFF	OFF	ON	OFF	ON	ON
D4		OFF	OFF	ON	OFF	ON	OFF	ON	ON
D5		ON	OFF	ON	OFF	ON	OFF	ON	ON
D6		OFF	ON	ON	OFF	ON	OFF	ON	ON
D7		ON	ON	ON	OFF	ON	OFF	ON	ON
D8		OFF	OFF	OFF	ON	ON	OFF	ON	ON
D9		ON	OFF	OFF	ON	ON	OFF	ON	ON
DA		OFF	ON	OFF	ON	ON	OFF	ON	ON
DB		ON	ON	OFF	ON	ON	OFF	ON	ON
DC		OFF	OFF	ON	ON	ON	OFF	ON	ON
DD		ON	OFF	ON	ON	ON	OFF	ON	ON
DE		OFF	ON	ON	ON	ON	OFF	ON	ON
DF		ON	ON	ON	ON	ON	OFF	ON	ON
E0		OFF	OFF	OFF	OFF	OFF	ON	ON	ON
E1		ON	OFF	OFF	OFF	OFF	ON	ON	ON
E2		OFF	ON	OFF	OFF	OFF	ON	ON	ON
E3		ON	ON	OFF	OFF	OFF	ON	ON	ON

ARMING CODE		DIP SWITCH POSITIONS							
HEX	ASCII	1	2	3	4	5	6	7	8
E4		OFF	OFF	ON	OFF	OFF	ON	ON	ON
E5		ON	OFF	ON	OFF	OFF	ON	ON	ON
E6		OFF	ON	ON	OFF	OFF	ON	ON	ON
E7		ON	ON	ON	OFF	OFF	ON	ON	ON
E8		OFF	OFF	OFF	ON	OFF	ON	ON	ON
E9		ON	OFF	OFF	ON	OFF	ON	ON	ON
EA		OFF	ON	OFF	ON	OFF	ON	ON	ON
EB		ON	ON	OFF	ON	OFF	ON	ON	ON
EC		OFF	OFF	ON	ON	OFF	ON	ON	ON
ED		ON	OFF	ON	ON	OFF	ON	ON	ON
EE		OFF	ON	ON	ON	OFF	ON	ON	ON
EF		ON	ON	ON	ON	OFF	ON	ON	ON
F0		OFF	OFF	OFF	OFF	ON	ON	ON	ON
F1		ON	OFF	OFF	OFF	ON	ON	ON	ON
F2		OFF	ON	OFF	OFF	ON	ON	ON	ON
F3		ON	ON	OFF	OFF	ON	ON	ON	ON
F4		OFF	OFF	ON	OFF	ON	ON	ON	ON
F5		ON	OFF	ON	OFF	ON	ON	ON	ON
F6		OFF	ON	ON	OFF	ON	ON	ON	ON
F7		ON	ON	ON	OFF	ON	ON	ON	ON
F8		OFF	OFF	OFF	ON	ON	ON	ON	ON
F9		ON	OFF	OFF	ON	ON	ON	ON	ON
FA		OFF	ON	OFF	ON	ON	ON	ON	ON
FB		ON	ON	OFF	ON	ON	ON	ON	ON
FC		OFF	OFF	ON	ON	ON	ON	ON	ON
FD		ON	OFF	ON	ON	ON	ON	ON	ON
FE		OFF	ON	ON	ON	ON	ON	ON	ON
FF		ON	ON	ON	ON	ON	ON	ON	ON

4. Installation

4.1 Placement

Place the High Speed COS-4 or High-Speed COS-8 in a cool, dry place close to an electrical outlet. It should be within 50 ft. (15.2 m) of the devices you want to connect to it.

NOTE

The High Speed COS-4 and COS-8 can be mounted in a standard 19" equipment rack with a rackmount adapter kit. The kit is not included with the unit; call your supplier for a special quote.

4.2 Cabling

This section describes the cables and procedures you'll use to connect equipment to the High Speed COS-4 or COS-8. Refer to Figure 4-1 on page 24 for an illustration of a typical application.

4.2.1 COMPUTER(S)↔COS

For each computer you want to connect to the High Speed COS-4 or COS-8, you'll need a cable containing at least 5 wires with a DB25 male connector on the COS end. If a computer is an IBM® AT® or PS/2® or compatible, the cable should have a DB9 female connector on the computer end. If a computer is an IBM PC/XT™ or compatible, the cable should have a DB25 female connector on the computer end. Assuming you've set the COS port(s) as DCE (see **Section 3.4**), the cable(s) should be wired as shown in Tables 4-1 and 4-2 on the next page. (Our product codes for cables pinned this way are EVMBMC for the DB9 type and ECM12C for the DB25 type.)

Connect the female end of each of these cables to the serial port (COM1, COM2, etc.) on the selected computer. If the selected computer is the "source" or "master" (the one that's doing the switching), connect the male end of the cable to the COS's common port (Port 0). If the computer is a "destination" or "slave" (one that's being switched between), connect the male end of the cable to the chosen numbered port on the COS.

Table 4-1. Pinning, AT Computer to COS (EVMBMC Cable*)

Computer DB9			COS as DCE DB25	
RD	2	----------	3	TD
TD	3	----------	2	RD
DTR†	4	----------	20	DTR†
SGND	5	----------	7	SGND
CTS†	8	----------	5	CTS†

Table 4-2. Pinning, PC/XT Computer or Serial Printer to COS (ECM12C Cable**)

Computer DB25			COS as DCE DB25	
TD	2	----------	2	RD
RD	3	----------	3	TD
CTS†	5	----------	5	CTS†
SGND	7	----------	7	SGND
DTR†	20	----------	20	DTR†

*Our EVNBMC cable is pinned this way. It also carries the other pins supported by the AT serial interface, but the High Speed COS-4 and COS-8 don't support any of the other pins except Pin 1, PGND, which is not required.

†When a device attached to the COS raises its flow-control lead, the COS sends the appropriate flow-control signal to the device on the other end of the connection. For example, suppose an administrator PC on Port 0 is communicating with a user PC on Port 4. Both PCs are DTEs, so both ports are set as DCE. When the PC on Port 0 raises DTR, the COS raises CTS on Port 4; and when the PC on Port 4 raises DTR, the COS raises CTS on Port 0. On the other hand, if the device on Port 4 is a mux (a DCE, so that Port 4 is set as DTE), then when the PC on Port 0 raises DTR, the COS raises DTR on Port 4; and when the mux on Port 4 raises CTS, the COS raises CTS on Port 0.

**Our ECM12C cable is pinnned this way. It also carries Pin 1, PGND, which the High Speed COS-4 and COS-8 support but doesn't require, as well as Pins 4, 6, 8, 15, 17, and 22 (RTS, DSR, RLSD [DCD], TSETC [TC], RSET [RC], and RI respectively), which the COSes don't support at all.

4.2.2 COS TO SERIAL PRINTER(S)

For each serial printer you want to connect to the High Speed COS-4 or COS-8, you'll need a cable containing at least 5 wires with DB25 male connectors on each end. Assuming you've set the COS port(s) as DCE (see **Section 3.4**), the cable(s) should be wired as shown in Table 4-2 on the previous page. (Our product code for a cable pinned this way is ECM12C.)

Connect one end of each of these cables to the input port on the selected printer. Connect the other end to the chosen numbered port on the COS.

4.2.3 MODEM(S)↔COS

We do not recommend attaching modems to the High Speed COS-4 or COS-8, because the COSes don't support Pin 4 (RTS), 6 (DSR), 8 (RLSD [DCD]), or 22 (RI). When other involved devices (especially PCs running terminal-emulation software) can't see these pins/signals (especially Pins 8 and 22), most applications involving modems will not function correctly.

However, if the device(s) on the other side of the COS don't need to see any of these non-supported pins, you can attach one or more modems to the COS, using cables containing at least 5 wires with DB25 male connectors on each end. Assuming you've set the COS port(s) as DTE (see **Section 3.4**), the cable(s) should be wired as shown in Table 4-3 on the next page. (Our product code for a cable pinned this way is ECM12C.)

Connect one end of each of these cables to the input port on the selected modem. If the selected modem is the "source" or "master" (the one that's doing the switching), connect the other end of the cable to the COS's common port (Port 0). If the modem is a "destination" or "slave" (one that's being switched between), connect the other end of the cable to the chosen numbered port on the COS.

Some other DCEs, including some multiplexors, line drivers, and short-haul modems, can function with only Pins 2, 3, 5, 7, and 20. You can attach them to the COS as described in the previous two paragraphs.

Table 4-3. Pinning, Modem to COS (ECM12C Cable*)

Modem DB25			COS as DTE DB25	
RD	2	----------	2	TD
TD	3	----------	3	RD
CTS†	5	----------	5	CTS†
SGND	7	----------	7	SGND
DTR†	20	----------	20	DTR†

*Our ECM12C cable is pinnned this way. It also carries Pin 1, PGND, which the High Speed COS-4 and COS-8 support but doesn't require, as well as Pins 4, 6, 8, 15, 17, and 22 (RTS, DSR, RLSD [DCD], TSETC [TC], RSET [RC], and RI respectively), which the COSes don't support at all.

††When a device attached to the COS raises its flow-control lead, the COS sends the appropriate flow-control signal to the device on the other end of the connection. For example, suppose a line driver on Port 0 is communicating with a mux on Port 4. Both the driver and the mux are DCEs, so both ports are set as DTE. When the line driver on Port 0 raises CTS, the COS raises DTR on Port 4; and when the mux on Port 4 raises CTS, the COS raises DTR on Port 0. On the other hand, if the device on Port 4 is a PC (a DTE, so that Port 4 is set as DCE), then when the line driver on Port 0 raises CTS, the COS raises CTS on Port 4; and when the PC on Port 4 raises DTR, the COS raises DTR on Port 0.

4.3 Power Connection

NOTE

The input voltage and frequency requirements of the included power-supply adapter (identified on the transformer's label) probably match the voltage and frequency output by your local electric utility, but check just to make sure.

Lastly, *when you are ready for the unit to start operating*, plug the output cord of the High Speed COS-4's or COS-8's power-supply adapter into the power socket (barrel jack) on the COS, then plug the adapter into a working outlet. The unit will power up *immediately*—it has no ON/OFF switch—and will perform a quick self-test. Digits 0 through 9 will appear in the 7-segment display as the COS tests its internal circuitry, and then the display will show "1" as the unit establishes a default connection between Port 0 (the master port) and Port 1.

Your High Speed COS-4 or COS-8 is now ready for continuous operation.

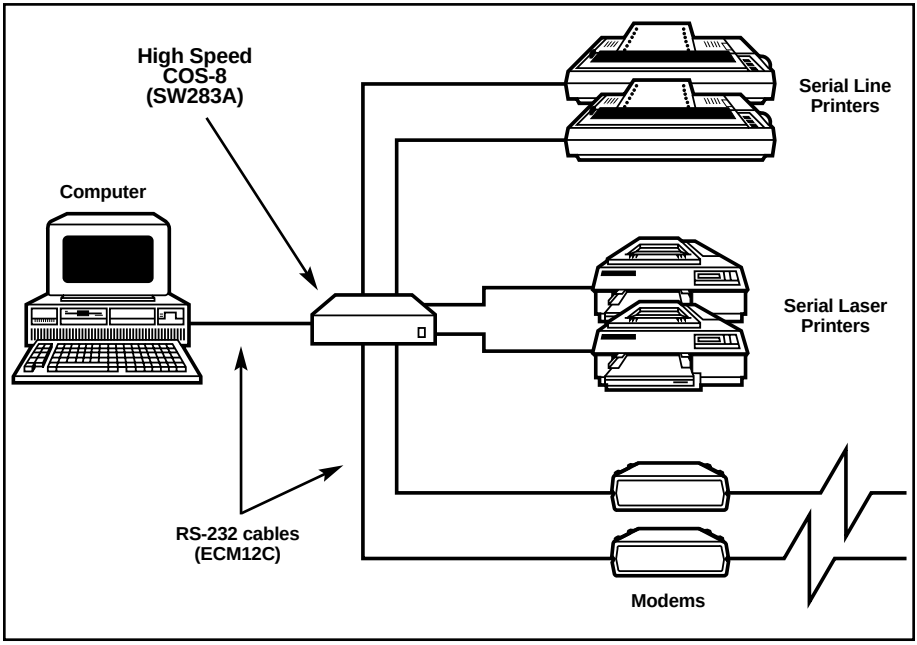


Figure 4-1. A computer switching between four serial printers and two modems through the High Speed COS-8.

5. Operation

5.1 Power-Up

As soon as you provide power to the High-Speed COS-4 or High Speed COS-8 (see **Section 4.3**), the unit will power up ("turn on"), make its default connection to Port 1, and perform its minimal self-test. If position 6 of DIP switch SW1 inside the COS is set to OFF (down), the COS will be ready to operate normally. If position 6 is set to ON (up), the COS will begin sending its barber-pole self-test (see **Section 5.3**) out of Port 1.

5.2 Switching

At any time, you can switch which port (and which attached "slave" or "destination" device) your "master" device (the one on the common port) has access to. Do this by sending the currently active arming code (see **Section 3.3**), followed by the character correpsonding to the number of the desired port ("1" through "4" for the High Speed COS-4 or "1" through "8" for the High Speed COS-8), from the master device.

You can also connect the master to all slaves (to send "broadcast" data to all ports) by sending the arming code followed by the number "9". While the COS is in this setting, however, there is no flow control or port contention among the slaves, and if more than one of them sends data at the same time, it will become hopelessly intermixed and garbled.

Finally, you can disconnect the master from all slaves by sending the arming code followed by the number "0" (zero). While the COS is in this setting, no data sent by any attached device will be passed to any other device.

The COS-4 and COS-8 have three switching modes: Text, Graphics, and Transparent. While the COS's front-panel "Mode" switch is in the TX (Text, left-hand) position, the COS operates in Text mode: The arming code and port character are recognized without a preceding pause. While the COS is in Text mode, its MODE LED is dark.

If you are using Text mode and you find that unwanted switching is occurring, move the COS's front-panel Mode switch to the GR (Graphics, center) position. In Graphics mode, a pause must occur before the arming code is recognized, so incidental occurrences of the arming code and the port character among data do not cause the COS to switch as readily. While the COS is in Graphics mode, its MODE LED is dark.

If unwanted switching continues to occur, try lengthening the graphics-mode pause. (This is the period of time that must elapse *after* the COS stops receiving data in Graphics mode *before* it will recognize the arming code if it receives it.) Lengthen the pause by setting positions 7 and 8 of the COS's DIP switch SW1 differently (see **Section 3.2**).

If you need to temporarily disable switching for some reason (for example, if you know there will be delays longer than 500 milliseconds during the transmission of a graphics file), you can move the COS's Mode switch to the TR (Transparent, right-hand) position. While the COS is in Transparent mode, the arming code is ignored, and the MODE LED is lit to remind you that switching is impossible until you change modes.

5.3 The Barber-Pole Self-Test

To have the High Speed COS-4 or COS-8 perform a self-test of its transmission circuitry, unplug it, open it up as described in **Section 3.2**, and set position 6 of its DIP switch SW1 to ON (up). Connect Port 1 to a terminal or other RS-232 device whose data rate and data format match those selected on the COS. Close the COS and turn it back on: The COS will begin outputting the following items to the RS-232 device connected to Port 1 *only*:

- The COS's EPROM version; then
- The current settings of switches SW1 and SW2; then
- A continuous "barber pole" pattern of ASCII characters.

To end the test and return to normal operation, take these steps:

1. Turn the COS off again;
2. If necessary, disconnect the RS-232 device from Port 1 and reconnect the original equipment;
3. Reopen the COS;
4. Set position 6 of the COS's DIP switch SW1 to OFF (down);
5. Reclose the COS (and make sure to screw the case back on securely); and
6. Turn the COS back on again.

6. Troubleshooting

6.1 First Steps

If your High Speed COS-4 or High Speed COS-8 does not seem to be passing data or switching correctly, the first thing to try is to have the COS perform its barber-pole self-test as described in **Section 5.3**. If the data that the COS is transmitting looks OK, check the settings of its front-panel Mode switch and its internal DIP switches and make sure these are correct. If they are, check the cables connected to the COS and make sure all of them are securely connected to the proper equipment at both ends. If the cabling is OK, turn the printer(s) off and back on and try again. If problems persist, reboot the computer(s) (saving any documents in progress first), reload the software you were using and the affected document(s), and try again. If you still have problems, contact your supplier.

6.2 Calling Your Supplier

If you determine that your High Speed COS-4 or COS-8 is malfunctioning, *do not attempt to alter or repair it*. Contact your supplier. The problem might be solvable over the phone.

Before you do, make a record of the history of the problem. Your supplier will be able to provide more efficient and accurate assistance if you have a complete description, including:

- The nature and duration of the problem.
- When the problem occurs.
- The components involved in the problem.
- Any particular application that, when used, appears to create the problem or make it worse.

6.3 Shipping and Packaging

If you need to transport or ship your High Speed COS-4 or COS-8:

- Package it carefully. We recommend that you use the original container.
- Before you ship a unit for repair or return, contact your supplier to get a Return Materials Authorization (RMA) number, and make sure you include everything you received with the unit when you ship it.

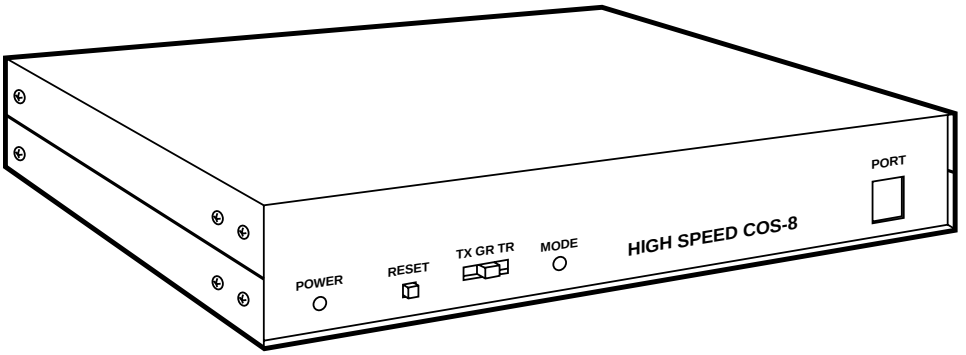
NOTES

NOTES

Black Box Corporation
The World's Source for Connectivity℠

APRIL 1998
SW282A
SW282AE
SW283A
SW283AE

High Speed COS-4
High Speed COS-8



CUSTOMER SUPPORT INFORMATION

To order or for technical support: Call **724-746-5500** or fax **724-746-0746**
Technical support and fax orders 24 hours a day, 7 days a week
Phone orders 24 hours, 7 A.M. Monday to midnight Friday; Saturday 8 to 4 (Eastern)
Mail order: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018