

## Serial and Parallel Communications

**ADDRESS:** Multiple devices are controlled on the same bus, each with a separate address or unit number. This address allows the host to communicate individually to each device.

**ASCII:** American Standard Code for Information Interchange. This code assigns a number to each numeral and letter of the alphabet. In this manner, information can be transmitted between machines as a series of binary numbers.

**BAUD RATE:** Number of bits transmitted per second. Typical rates include 300; 600; 1,200; 2,400; 4,800; 9,600, 19,200. This means at 9,600 baud, 1 character can be sent nearly every millisecond.

**DATA BITS:** Since the ASCII set consists of 128 characters, computers may transmit only 7 bits of data. Most computers do, however, support an 8-bit extended ASCII character set.

**DCE:** Data Communications Equipment transmits on pin 3 and receives on pin 2.

**DTE:** Data Terminal Equipment. Transmits on pin 2 and receives on pin 3.

**FULL DUPLEX:** The terminal will display only received or echoed characters.

**HALF DUPLEX:** In half duplex mode, a terminal will display every character transmitted. It may also display the received character.

**HANDSHAKING SIGNALS:**

RTS: Request To Send     DTR: Data Terminal Ready  
CTS: Clear To Send     IDB: Input Data Buffer  
DSR: Data Set Ready     ODB: Output Data Buffer

**NULL MODEM:** A simple device or set of connectors that switches the receive and transmit lines a 3-wire RS-232C connector.

**PARITY:** An RS-232C error detection scheme that can detect an odd number of transmission errors.

**SERIAL POLLING:** Method of checking the status of the IEEE-488 device. By reading the status byte, the host can determine if the device is ready to receive or send characters.

**START BITS:** When using RS-232C, one or two bits are added to every character to signal the end of a character.

**TEXT/ECHO (ON/OFF):** This setup allows received characters to be re-transmitted back to the original sending device. Echoing characters can be used to verify or "close the loop" on a transmission.

**XON/XOFF:** Two ASCII characters supported in some serial communication programs. If supported, the receiving device transmits an XOFF character to the host when its character buffer is full. The XOFF character directs the host to stop transmitting characters to the device. Once the buffer empties, the device will transmit an XON character to signal the host to resume transmission.

## ASCII Table

DEC	HEX	GRAPHIC	DEC	HEX	GRAPHIC	DEC	HEX	GRAPHIC	DEC	HEX	GRAPHIC	DEC	HEX	GRAPHIC
000	00	NUL	030	1E	RS	059	3B	;	088	58	X	117	75	u
001	01	SOH	031	1F	US	060	3C	<	089	59	Y	118	76	v
002	02	STX	032	20	SPACE	061	3D	=	090	5A	Z	119	77	w
003	03	ETX	033	21	!	062	3E	>	091	5B	[	120	78	x
004	04	EOT	034	22	"	063	3F	?	092	5C	/	121	79	y
005	05	ENQ	035	23	#	064	40	@	093	5D	]	122	7A	z
006	06	ACK	036	24	\$	065	41	A	094	5E	V	123	7B	{
007	07	BEL	037	25	%	066	42	B	095	5F	-	124	7C	
008	08	BS	038	26	&	067	43	C	096	60	'	125	7D	}
009	09	HT	039	27	'	068	44	D	097	61	a	126	7E	~
010	0A	LF	040	28	(	069	45	E	098	62	b	127	7F	DEL
011	0B	VT	041	29	)	070	46	F	099	63	c			
012	0C	FF	042	2A	*	071	47	G	100	64	d			
013	0D	CR	043	2B	+	072	48	H	101	65	e			
014	0E	SO	044	2C	,	073	49	I	102	66	f			
015	0F	S1	045	2D	-	074	4A	J	103	67	g			
016	10	DLE	046	2E	.	074	4B	K	104	68	h			
017	11	DC1	047	2F	/	075	4C	L	105	69	i			
018	12	DC2	048	30	0	076	4D	M	106	6A	j			
019	13	DC3	049	31	1	077	4E	N	107	6B	k			
020	14	DC4	050	32	2	078	4F	O	108	6C	l			
021	15	NAK	051	33	3	080	50	P	109	6D	m			
022	16	SYN	052	34	4	081	51	Q	110	6E	n			
023	17	ETB	053	35	5	082	52	R	111	6F	o			
024	18	CAN	054	36	6	083	53	S	112	70	p			
025	19	EM	055	37	7	084	54	T	113	71	q			
026	1A	SUB	056	38	8	085	55	U	114	72	r			
027	1B	ESC	057	39	9	086	56	V	115	73	s			
028	1C	FS	058	3A	:	087	57	W	116	74	t			