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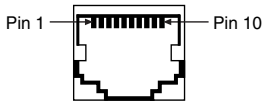
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Serial Quick Reference Guide

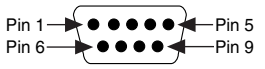
10-Position Modular Jack



Pin	232	422/485
1	No Connect	No Connect
2	RI[1]	TXD–
3	CTS	TXD+
4	RTS	RTS– (HSO–)
5	DSR[1]	CTS– (HSI–)
6	GND	RXD–
7	DTR[1]	RXD+
8	TXD	RTS+ (HSO+)
9	RXD	CTS+ (HSI+)
10	DCD[1]	GND

[1] These signals are "No Connect" on the PCI-232I and PXI-8422 ports.

DB-9 Male

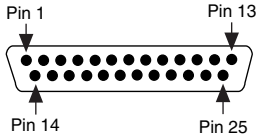


Pin	232 DTE	232 DCE	422/485
1	DCD[2]	DCD	GND
2	RXD	TXD	CTS+ (HSI+)
3	TXD	RXD	RTS+ (HSO+)
4	DTR[2]	DSR	RXD+
5	GND	GND	RXD–
6	DSR[2]	DTR	CTS– (HSI–)
7	RTS	CTS	RTS– (HSO–)
8	CTS	RTS	TXD+
9	RI[2]	RI	TXD–

Note: DCE mode supported on USB-232/2 and USB-232/4 only.

[2] These signals are "No Connect" on the PCI-232I and PXI-8422 ports and ports 9–16 on legacy 16-port boards.

DB-25 Male

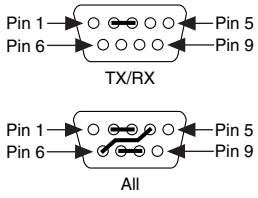


Pin	232	422/485
2	TXD	RTS+ (HSO+)
3	RXD	CTS+ (HSI+)
4	RTS	RTS– (HSO–)
5	CTS	TXD+
6	DSR[3]	CTS– (HSI–)
7	GND	RXD–
8	DCD[3]	GND
20	DTR[3]	RXD+
22	RI[3]	TXD–

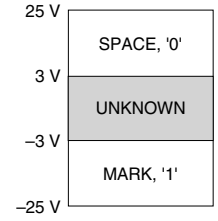
Pins not listed in this table are "No Connect."

[3] These signals are "No Connect" on the PCI-232I and PXI-8422 ports.

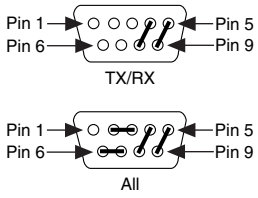
RS-232 Loopback



RS-232 Signals



RS-485/422 Loopback

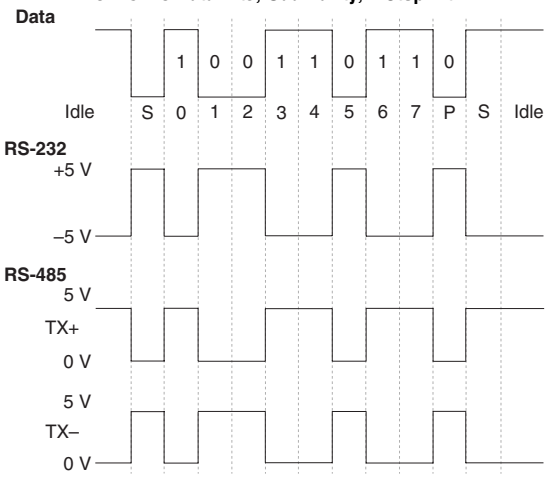


RS-485/422 Signals

If '–' < '+' then MARK, '1'
If '–' > '+' then SPACE, '0'
RS-422 Voltage: ± 7V
RS-485 Voltage: –7V to +12 V

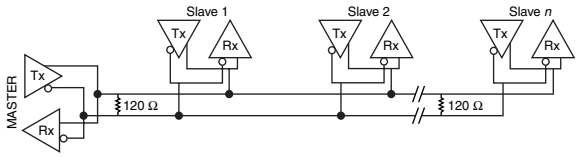
UART Data Frame Example

0xD9—8 Data Bits, Odd Parity, 1 Stop Bit

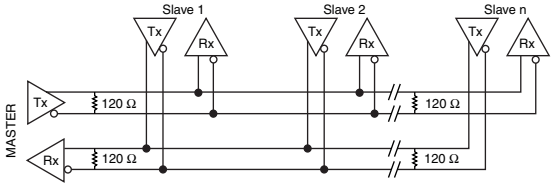


Voltages are for illustration only. Actual voltage levels may vary.

RS-485 Topologies



2-Wire Multidrop Network Using Terminating Resistors



4-Wire Full-Duplex Multidrop Network Using Terminating Resistors

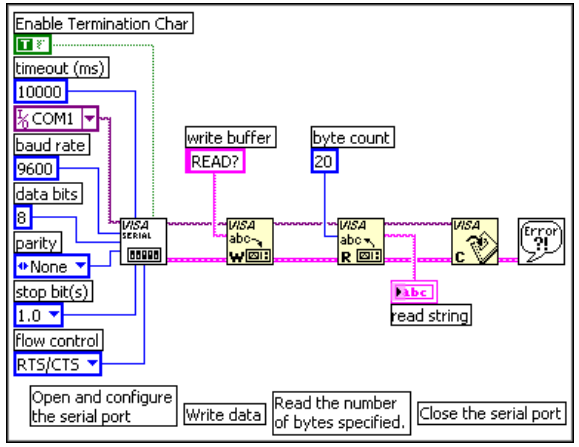
RS-485 terminators are available at `ni.com/serial`.

RS-485 Transceiver Control

Enable	4-Wire	2-Wire		
		DTR/Echo	DTR/No Echo	Auto
TX	ON	DTR	DTR	TX
RX	ON	ON	$\overline{\text{DTR}}$	$\overline{\text{TX}}$

Transceiver control is available on all NI Serial RS-485 interface products.

LabVIEW Programming Example



For more information about LabVIEW, refer to `ni.com/labview`.

NI-Serial Features

Hardware

- Flexible baud rates up to 3 Mb/s
- High-performance DMA engine
- Isolation up to 2000 V
- RS-485 transceiver control

Software

- Deterministic control with LabVIEW Real-Time
- Over 3000 instrument drivers online
- Powerful development tools

For more information about NI Serial products, refer to `ni.com/serial`.

ASCII Table

Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char
0	0x00	(nul)	32	0x20	(sp)	64	0x40	@	96	0x60	‘
1	0x01	(soh)	33	0x21	!	65	0x41	A	97	0x61	a
2	0x02	(stx)	34	0x22	“	66	0x42	B	98	0x62	b
3	0x03	(etx)	35	0x23	#	67	0x43	C	99	0x63	c
4	0x04	(eot)	36	0x24	$	68	0x44	D	100	0x64	d
5	0x05	(enq)	37	0x25	%	69	0x45	E	101	0x65	e
6	0x06	(ack)	38	0x26	&	70	0x46	F	102	0x66	f
7	0x07	(bel)	39	0x27	‘	71	0x47	G	103	0x67	g
8	0x08	(bs)	40	0x28	(	72	0x48	H	104	0x68	h
9	0x09	(tab)	41	0x29	)	73	0x49	I	105	0x69	i
10	0x0A	(lf)	42	0x2A	*	74	0x4A	J	106	0x6A	j
11	0x0B	(vt)	43	0x2B	+	75	0x4B	K	107	0x6B	k
12	0x0C	(ff)	44	0x2C	,	76	0x4C	L	108	0x6C	l
13	0x0D	(cr)	45	0x2D	-	77	0x4D	M	109	0x6D	m
14	0x0E	(so)	46	0x2E	.	78	0x4E	N	110	0x6E	n
15	0x0F	(si)	47	0x2F	/	79	0x4F	O	111	0x6F	o
16	0x10	(dle)	48	0x30	0	80	0x50	P	112	0x70	p
17	0x11	(dc1)	49	0x31	1	81	0x51	Q	113	0x71	q
18	0x12	(dc2)	50	0x32	2	82	0x52	R	114	0x72	r
19	0x13	(dc3)	51	0x33	3	83	0x53	S	115	0x73	s
20	0x14	(dc4)	52	0x34	4	84	0x54	T	116	0x74	t
21	0x15	(nak)	53	0x35	5	85	0x55	U	117	0x75	u
22	0x16	(syn)	54	0x36	6	86	0x56	V	118	0x76	v
23	0x17	(etb)	55	0x37	7	87	0x57	W	119	0x77	w
24	0x18	(can)	56	0x38	8	88	0x58	X	120	0x78	x
25	0x19	(em)	57	0x39	9	89	0x59	Y	121	0x79	y
26	0x1A	(sub)	58	0x3A	:	90	0x5A	Z	122	0x7A	z
27	0x1B	(esc)	59	0x3B	;	91	0x5B	[	123	0x7B	{
28	0x1C	(fs)	60	0x3C	<	92	0x5C	\	124	0x7C	|
29	0x1D	(gs)	61	0x3D	=	93	0x5D	]	125	0x7D	}
30	0x1E	(rs)	62	0x3E	>	94	0x5E	^	126	0x7E	~
31	0x1F	(us)	63	0x3F	?	95	0x5F	_	127	0x7F	(del)

For more information about NI products, refer to `ni.com`.

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