

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-

² These signals are "No Connect" on the PCI-232I and PXI-8422 ports and pins 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-485/422 Loopback

RS-232 Signals

RS-485/422 Signals

If '1' < '+'
then MARK, '1'

If '1' > '+'
then SPACE, '0'

RS-422 Voltage: ±7 V

RS-485 Voltage: -7 V to +12 V

UART Data Frame Example

0x09—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

The driver directly supports 4-wire full-duplex operation on peer-to-peer RS-485 networks. Multidrop RS-485 networks require additional software development.

LabVIEW Programming Example

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

ASCII Table

Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char
0	0x00	(nul)	32	0x20	space	64	0x40	@
1	0x01	(soh)	33	0x21	!	65	0x41	A
2	0x02	(stx)	34	0x22	"	66	0x42	B
3	0x03	(etx)	35	0x23	#	67	0x43	C
4	0x04	(eot)	36	0x24	\$	68	0x44	D
5	0x05	(enq)	37	0x25	%	69	0x45	E
6	0x06	(ack)	38	0x26	&	70	0x46	F
7	0x07	(bel)	39	0x27	'	71	0x47	G
8	0x08	(bs)	40	0x28	(	72	0x48	H
9	0x09	(tab)	41	0x29	)	73	0x49	I
10	0x0A	(lf)	42	0x2A	*	74	0x4A	J
11	0x0B	(vt)	43	0x2B	+	75	0x4B	K
12	0x0C	(ff)	44	0x2C	,	76	0x4C	L
13	0x0D	(cr)	45	0x2D	-	77	0x4D	M
14	0x0E	(so)	46	0x2E	.	78	0x4E	N
15	0x0F	(si)	47	0x2F	/	79	0x4F	O
16	0x10	(dle)	48	0x30	0	80	0x50	P
17	0x11	(dc1)	49	0x31	1	81	0x51	Q
18	0x12	(dc2)	50	0x32	2	82	0x52	R
19	0x13	(dc3)	51	0x33	3	83	0x53	S
20	0x14	(dc4)	52	0x34	4	84	0x54	T
21	0x15	(nak)	53	0x35	5	85	0x55	U
22	0x16	(syn)	54	0x36	6	86	0x56	V
23	0x17	(etb)	55	0x37	7	87	0x57	W
24	0x18	(can)	56	0x38	8	88	0x58	X
25	0x19	(em)	57	0x39	9	89	0x59	Y
26	0x1A	(sub)	58	0x3A	:	90	0x5A	Z
27	0x1B	(esc)	59	0x3B	;	91	0x5B	[
28	0x1C	(fs)	60	0x3C	<	92	0x5C	\
29	0x1D	(gs)	61	0x3D	=	93	0x5D	]
30	0x1E	(rs)	62	0x3E	>	94	0x5E	^
31	0x1F	(us)	63	0x3F	?	95	0x5F	_
						127	0x7F	(del)

RS-485 Transceiver Control

Enable	4-Wire	2-Wire		
		DTR/Echo	DTR/No Echo	Auto
TX	ON	DTR	DTR	TX
RX	ON	ON	DTR	TX

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.