FSK MODEM CONNECTIONS

The MARC 166-101 FSK modem for Allen-Bradley SLC500 PLCs standard factory configuration sets up the modem for Bell 202 compatibility and for operation on a 4-wire leased telephone line. Other modes of operation are user selectable by changing jumpers located on the FSK Modem printed circuit board This application note describes the modem option jumpers and connections.

The standard configuration uses port 1 (upper connector) for RS232 communication and the RJ11 jack for the telephone line connection. Port 2 is not used.

STANDARD JUMPER CONFIGURATION

J1	3-4	
	7-8	P1= RS232
	10-12	
J2	3-4	
	7-8	P2= RS232
	10-12	
J3	1-2	
J4	1-2	
J5	2-3	4-wire operation
J6	2-3	
J7	1-2	P1-Pin 4 is active
J8	1-2	P2-Pin 4 is active
J10	1-3, 4-6, 7-9, 10-12, 13-15 & 16-18	P1 is DCE Pinout (see below)
P5	5-6	P1-Pin 6 is DCD
	9-10	On-Line LED is DCD
	11-12	P1-Pin 8 is CTS
	13-14	P1-Pin 2 is Received Data
	15-16	P1-Pin 7 is RTS
	17-18	P1-Pin 3 is Transmit Data
P4	1-2	Error LED is enabled
	5-21	Modem is enabled
	6-22	DSR is HIGH
	13-14	DTR Dialing enabled
	25-24	On-Line LED is DCD

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CONNECTOR PINOUT

Connector P1 is used for RS232 communication. The pin-out of connector P1 with standard jumpers installed is shown below. The connections shown below are "DCE" connections. Connector P1 can be setup to have "DTE" connections by changing jumper J10 to have the following connections: 2-4, 3-5, 8-10, 9-11, 14-16 and 15-17. This will effectively reverse the signals on 2 and 3, 4 and 6 and 7 and 8. Connector P2 is always a DTE connector.

1	NC	Used only for RS422/RS-485 operation
2	RD	OUTPUT Data received by modem
3	TD	INPUT Data to be transmitted from modem
4	DTR	INPUT Data Terminal Ready
5	GND	Signal reference
6	DCD	OUTPUT Data Carrier Detected
7	RTS	INPUT Request to send to modem
8	CTS	OUTPUT Clear to send from modem
9	NC	Used only for RS-422/RS-485 operation

PHONE LINE CONNECTIONS

The RJ-11 connector is used for connection to the telephone line. A standard modular line cord can be used for the telephone connection. The RJ-11 pin-out is shown below. When connecting two modems back-to-back remember to reverse the transmit and receive wires so that the transmit output of one modem goes to the receive input of the other modem.

The PTT Output can be used as a "Push-to-Talk" signal to key a radio transmitter when using the FSK modem with a radio. The PTT output is an isolated dry relay contact output that will be closed when the FSK modem is ready to transmit (its RTS input is high). The PTT relay is enabled by installing jumper J12. The output can be referenced to the modems digital ground by installing jumper J11. Standard configuration does not have the jumpers installed.

1	PTT Output
2	RX+ (Yellow)
3	TX+ (Green)
4	TX- (Red)
5	RX- (Black)
6	PTT Common

TRANSMIT LEVEL SELECTION

The transmit level is set by setting switch SW1 as shown below. For standard output levels only one position should be on at a time. Lower output levels can be obtained by turning on more than one switch at a time.

SW1	-1	+ 2dB
	-2	0dB
	-3	-2dB
	-4	-4dB
	-5	-6dB
	-6	-8dB
	-7	-10dB
	-8	-12dB

MODEM MODE SELECTION

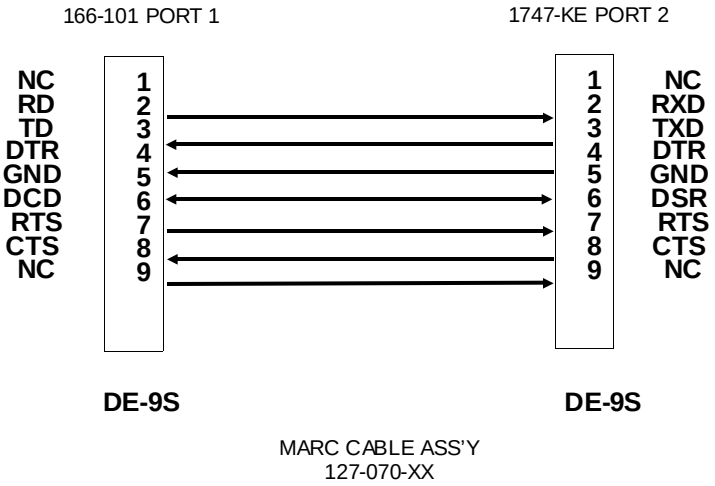
The 7 position switch located on the modem plug-in module is used to select the operating mode of the modem. The factory default is Bell 202 full duplex. Other operating modes can be obtained by changing the switch settings as shown below.

1	2	3	4	5	6	7	8	OPERATING MODE
X	X	1	1	1	1	1	X	Bell 103 Originate, 300 bps, Full duplex
X	X	1	1	1	1	0	X	Bell 103 Answer, 300 bps, Full duplex
X	X	1	1	1	0	1	X	Bell 202 1200 bps, Half duplex
X	X	1	1	1	0	0	X	Bell 202, 1200 bps, Half duplex with equalizer
X	X	1	1	0	1	1	X	CCITT V.21 Originate, 300 bps, Full duplex
X	X	1	1	0	1	0	X	CCITT V.21 Answer, 300 bps, Full duplex
X	X	1	1	0	0	1	X	CCITT V.23 Mode 2, 1200 bps, Half duplex
X	X	1	1	0	0	0	X	CCITT V.23 Mode 2, 1200 bps, Half duplex with equalizer
X	X	1	0	1	1	1	X	CCITT V.23 Mode 1, 600 bps, Half duplex
X	X	1	0	0	1	1	X	CCITT V.23 Mode 1, 600 bpx, Half duplex with Soft Turn Off
X	X	1	0	0	0	1	X	CCITT V.23 Mode 2, 1200 bps, Half duplex with Soft Turn Off
X	X	1	0	0	0	0	X	CCITT V.23 Mode 2, 1200 bps, Half duplex with equalizer and Soft Turn Off
X	X	0	1	1	0	1	X	Bell 202, 1200 bps, Full duplex
X	X	0	1	1	0	0	X	Bell 202, 1200 bps, Full duplex with equalizer
X	X	0	1	0	0	1	X	CCITT V.23 Mode 2, 1200 bps, Full duplex
X	X	0	1	0	0	0	X	CCITT V.23 Mode 2, 1200 bps, Full duplex with equalizer
X	X	0	0	1	1	1	X	CCITT V.23 Mode 1, 600 bps, Full duplex

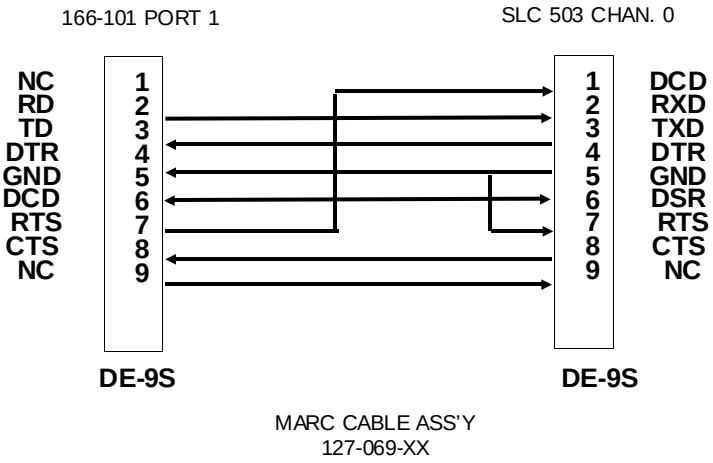
X= Not Used, 0= Switch OFF, 1= Switch ON

TYPICAL CONNECTIONS

The following two diagrams detail the most common cable connections to the FSK Modem. Other configurations are possible depending on the application. Please contact the customer support department at the numbers listed below for assistance when building custom cable assemblies.



FSK MODEM TO 1747-KE



FSK MODEM TO SLC 503