

60-232/422-1

Serial Port Expansion Board

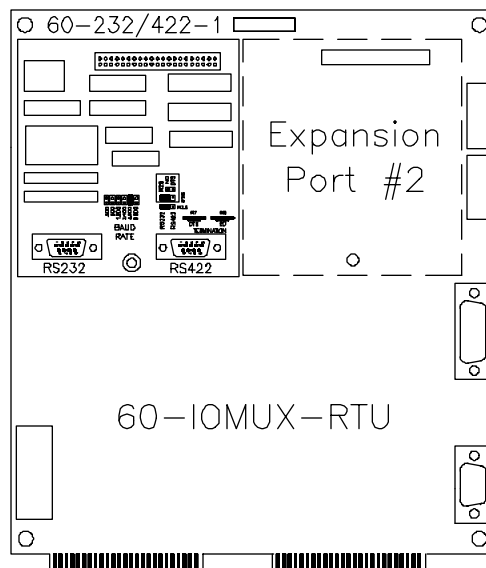
The **60-232/422-1** is a Series 60 expansion board that adds one additional serial port to any **IOMUX** station. Both RS232 and RS422 communications are supported and can be field configured. The **60-232/422-1** is a low cost alternative to the **60-COM-2** co-processor board.

Use the **60-232/422-1** to provide:

- One additional RS232 port on a modem (-M) **IOMUX** for applications up to 9600 baud
- One additional RS232 port on a network (-N) **IOMUX** for applications up to 4800 baud
- An RS422 port on any **IOMUX** station
- A replacement RS232 port for a **60-6MT-232** when the 6MT (Series 6 I/O) port is not used
- Field selection between an RS232 port and an RS422 port

Select the **60-COM-2** when you need:

- RS485 (two wire) systems
- Multidrop (partyline) communications
- Half duplex radio links
- Fast communications up to 38,400 baud
- Time critical applications that will benefit from real-time co-processor performance
- Two serial ports on one expansion board



Section 1

General Description

The **60-232/422-1** is a Series 60 expansion board that plugs onto an expansion port on any **IOMUX** controller. The one serial port on this board can be field configured through a jumper to be an RS232 or RS422 port. There are two DB9 nine pin connectors on the circuit board, to facilitate cable wiring to the board. The baud rate is jumper selectable, with six settings between 300 and 9600 baud. The communication parameters default to eight data bits, one stop bit and no parity, but can be changed through use of the **SCIL** ioctl() function, or

through settings in **Muxinit**, the **IOMUX** menu-driven configuration utility. Hardware and software handshaking methods are supported by the **60-232/422-1**, with hardware handshaking being the default mode. (XON/XOFF handshaking is selectable through **Muxinit**.) RTS and CTS handshaking signals are provided for use with either RS232 or RS422 operation. The CTS signal functions normally for either the RS232 or RS422 port, or it can be permanently tied to a TRUE state (disabled) through jumper settings.

Section 2

Signal Connections

Here are descriptions of the RS232/RS422 signals supported by the **60-232/422-1**.

Receive Data (Input)

This is data entering the **60-232/422-1**.

Transmit Data (Output)

This is transmitted data leaving the **60-232/422-1**.

Data Terminal Ready (Output)

This output signal is permanently high, indicating that the **60-232/422-1** is ready for communication.

Request to Send (Output)

The RTS line is asserted when the **IOMUX** is ready to receive data.

Clear to Send (Input)

This input signal, when high (asserted), indicates to the **60-232/422-1** that the remote device is ready to receive data. The **60-232/422-1** is inhibited from transmitting while CTS is not asserted.

2-1: RS232 Cable Connections

A male DB9 connector, P1, is provided on the **60-232/422-1** for making connections to your RS232 serial device. The pinout pattern for the signals listed is compatible with standard AT/386 and PS/2 nine pin RS232 ports. Refer to Figure 2-1 for common cable connections.

Note: You may connect to either P1 (RS232 port) or P2 (RS422 port) but not both simultaneously.

Note: An unused RS232 port should be wired in a loopback configuration (connect pin 2 to pin 3) to prevent stray characters from interfering with the self-seeking main port feature, which exists in version 5 **IOMUX** firmware.

RS232 Connections (DTE)

P1 Pin #	RS232 Signal Description	
1	No Connection	
2	Receive Data	RCD
3	Transmit Data	TXD
4	Data Terminal Ready	DTR
5	Signal Ground	GND
6	No Connection	
7	Request to Send	RTS
8	Clear to Send	CTS
9	No Connection	

2-2: RS422 Cable Connections

A male DB9 connector, P2, is provided on the **60-232/422-1** for making connections to your RS422 serial device. The signals function as previously described.

Note: An unused RS422 port should be wired in a loopback configuration (pin 2 to pin 3, pin 1 to pin 4) to prevent stray characters from interfering with the self-seeking main port feature, which exists in version 5 **IOMUX** firmware.

RS422 Connections (DTE)

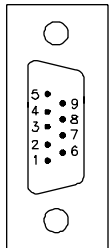
P2 Pin #	RS422 Signal Description
1	Receive Data In (-)
2	Receive Data In (+)
3	Transmit Data Out (+)
4	Transmit Data Out (-)
5	Signal Ground
6	Request to Send Output (+)
7	Request to Send Output (-)
8	Clear to Send Input (-)
9	Clear to Send Input (+)

RD, CTS Input Termination (RS422 only)

The RS422 RD (receive data) and CTS input signal lines on the board are factory terminated with 150 ohm, 1/4W 5% resistors (R7 and R8). The value of these resistors should only be changed if you are using a cable with a nominal impedance that is much different than 150 ohms. You may alter the termination by unplugging resistors R7 and R8 and substituting the appropriate resistor values. R7 terminates the CTS input, and R8 terminates the receive input. A mismatched resistor will not damage the board. It may, however, impair communications.

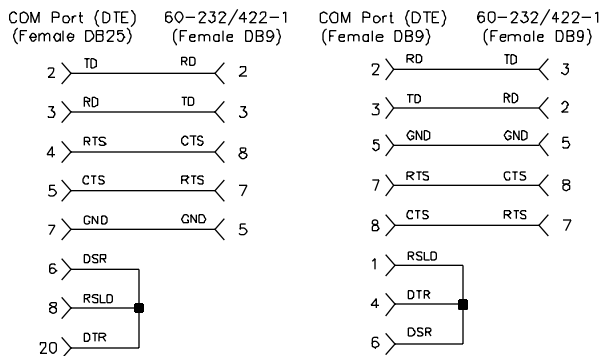
Enable/Disable Hardware Handshaking

The **60-232/422-1**, as configured from the factory, requires the use of hardware handshaking. The CTS signal can be disabled by populating jumper W29. This forces CTS to be always TRUE.

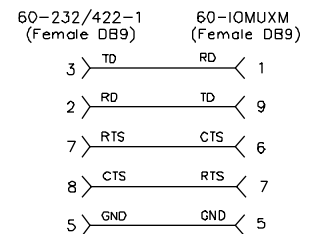


DB9 Female Connector,
(On the Mating Cable)
Solder Side View

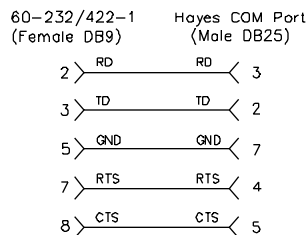
Cable for IBM COM Port
to 60-232/422-1 RS232 Port



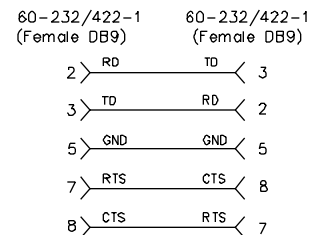
Cable for 60-232/422-1 RS232 Port
to 60-IOMUXM Main Port



Cable for 60-232/422-1 RS232 Port
to Hayes Modem



Cable for 60-232/422-1 RS232 Port
to 60-232/422-1 RS232 Port



Typical 60-232/422-1 RS232 Port Connections

Figure 2-1

Section 3

60-232/422-1 Additional Information

Hardware Compatibility

The 60-232/422-1 can be installed on any IOMUX-RTU distributed controller, or any IOMUX-FEB unit manufactured after 1988. The IOMUX firmware revision (as indicated on the EPROM label) must be version 5.1 or later. Firmware upgrades are available only for IOMUX controllers that currently have version 4.1 or later firmware.

Software Requirements

The Muxinit configuration utility, version 5.2 or later, must be used to configure an IOMUX populated with a 60-232/422-1.

Baud Rate Selection

The baud rate is selected through the setting of a movable shunt on the 60-232/422-1 board. There are six baud rates available, from 300 to 9600 baud. Place the shunt across the appropriate pins. Refer to Figure 3-1 for the available positions. Do not place multiple jumpers on the pins, or turn the shunt 90 degrees. This will short two signals together, and impede operation.

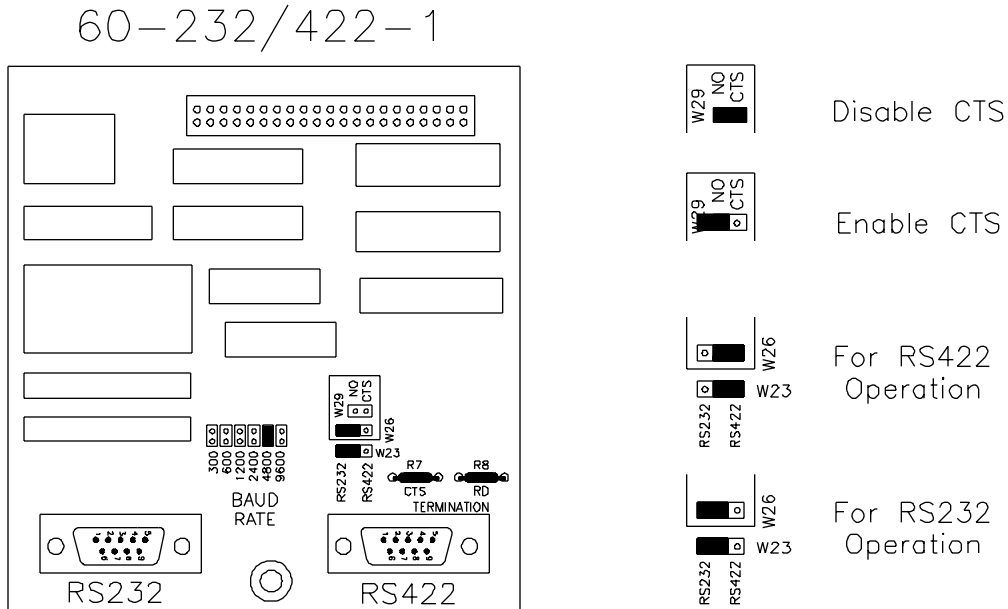
Note: Do not use the 9600 baud setting when the 60-232/422-1 is installed on a network (-N) version IOMUX controller, except in situations where the network is disabled or unused.

Jumper Settings

There are several jumpers on the 60-232/422-1 board. Jumpers W23 and W26 are positioned simultaneously, to select RS232 or RS422 operation. Jumper W29 enables the CTS handshaking signal, or forces CTS to a disabled (permanently TRUE) state. The baud rate selection jumper functions as previously described. Refer to Figure 3-1 for the location and positioning of these jumpers.

Typical Performance Specifications

Number of Communications Ports	1
Minimum Baud Rate	300
Maximum Baud Rate	9600
Power Requirement	Supplied by IOMUX
Operating Temperature Range	0 to 65 degrees C



60-232/422-1 Jumper Settings

Figure 3-1

Revised April 1992