OPTO 22

DATA SHEET

Form 466-030613

Part Number	Description
AC7	RS232 to RS422 Converter

Description

INTRODUCTION

The AC7 is a stand-alone adapter card that converts RS-232 serial communication to RS-422 serial communication, which is directly compatible with the Optomux family of intelligent brain boards.

Features

RS-422 balanced line drivers
Operates with up to 5,000 feet of RS-422 twisted-pair cable
Optical isolation between RS-232 and RS-422 lines
Visual LED indicators for transmit and receive lines
Transmission speeds up to 38,400 bits per second
(Only "REV 1" boards and above, can be used up to 38,400 baud.
Earlier revision boards will operate up to 19,200 baud only.)

Installation

PHYSICAL INSTALLATION

The following equipment should be available during installation of the AC7:

- Medium sized, flat-blade screw driver
- Wire stripper
- 25-Watt soldering iron
- 18 guage wire for power connections
- 22 guage twisted-pair RS-422 cable for data link

MOUNTING THE AC7

The AC7 adapter card can be mounted in any position on any flat surface. The adapter card is supplied with 3/4" standoffs. All the standoffs should be secured using #6 hardware to provide maximum physical strength. Leave sufficient space around the AC7 for serial data link and power wiring.

CONNECTING POWER SUPPLIES

Single Power Supply - No Optical Isolation

The 5-Volt power required by AC7 can be derived from the +12-Volt power input by an onboard regulator, eliminating the need for a separate +5-Volt supply. Using the onboard regulator defeats the optical isolation feature, but provides satisfactory operation in many applications. To use the 5-Volt regulator, install jumpers "E" and "F" and Do Not Connect anything to the 5-Volt input terminals.

In this mode, AC7 requires +12 Volts at 200 milliamps and -12 Volts at 50 milliamps.

OPTICAL ISOLATION ON AC7

A 5V power supply can be used to provide optical isolation on the AC7 by connecting to the 5V terminals.

Two Power Supplies - Provides Optical Isolation

To take advantage of the Optical Isolation feature of the AC7, separate power supplies for +5 Volts and for +12 and -12 Volts are required. In this mode, AC7 requires 200 milliamps at +5 Volts and 50 milliamps at +12 and -12 Volts. Jumpers "E" and "F" MUST be removed if a separate +5 Volt power supply is connected.

Installation (continued)

CONNECT AC7

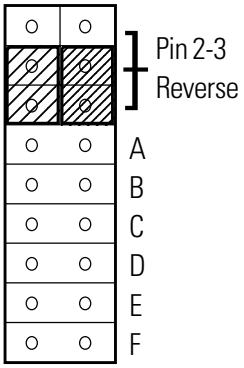
Connect the RS232 data connector on the AC7 to the serial port connector on your host computer using a null modem cable. The AC7 can be located up to 50 cable feet from the RS232 serial port.

A null modem cable can be fabricated from the following diagram. The AC7 end uses a standard 25-pin, male "D" connector.

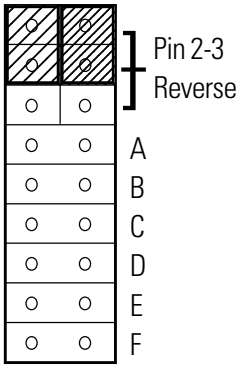
DB25 on PC end of cable	**DB25 on AC7 end of cable**
TX, pin 2	RX, pin 3
RX, pin 3	TX, pin 2
Signal Common, pin 7	Signal Common, pin7

REVERSING PINS 2 AND 3 ON AC7

The AC7 provides a set of jumpers that allows you to reverse pins 2 and 3. This is helpful if you are using a cable that is not a null modem. The jumpers are installed at the factory for use with a null modem cable.



Pins 2 and 3 Not Reversed (Factory Installation)



Pins 2 and 3 Reversed

Installation (continued)

ENABLING SIGNALS

Fabricated Cable

Many serial ports monitor pins on the RS232 connector as an indication that the connected data equipment is ready to receive data. If you are fabricating your own cable, the required logic levels can be provided by "looping back" the appropriate pins on the RS232 connector that attaches to your serial port. For example, when connecting the AC7 to a PC DB25 serial port, pins 5, 6, 8 and 20 must be tied together.

Purchased Cable

If you are using a commercially prepared data cable that carries handshaking signals required by your RS232 port through to the AC7, jumpers A through D may be used to enable the appropriate RS232 signals on your computer. The table below describes the function of each of the jumpers. J1 is the RS232 connector on the AC7.

Jumper	Connects
A	pin 20 (DTR) to +12V
B	pin 6 (DSR) to pin 20 (DTR)
C	pin 8 (DCD) to pin 4 (RTS)
D	pin 4 (RTS) to +12V

NOTE: These signals are provided for use by the host computer only -- AC7 uses only pins 2, 3 and 7 of the RS232 connector.

CONNECT AC7

Connect the RS-422 cable to the Optomux network using two twisted pairs plus one additional insulated wire for the signal common. The recommended colors are yellow, red, green, black and blue.

Strip 1/8 to 1/4 inch insulation from both ends of each wire. Use the table below to connect the RS422 communications wires between the adapter card and OPTOMUX.

CAUTION: Make sure the power is OFF while making or removing all connections to the AC7 and OPTOMUX.

Connect the RS422 communication wires as follows:

AC7 Terminal	OPTOMUX Terminal	
To OPTOMUX (+)	From Host (+)	One Twisted Pair
To OPTOMUX (-)	From Host (-)	
From OPTOMUX (+)	To Host (+)	Second Twisted Pair
From OPTOMUX (-)	To Host (-)	
AC7 +5 Return	COM	Insulated wire which is typically from a third twisted pair

Specifications

Power Requirements (Optical Isolation Mode)	200mA @ +5 VDC 50 mA @ +12 VDC 50 mA @ -12 VDC Voltage Tolerace = ±0.1 VDC
Power Requirements (Non-Isolated Mode)	200 mA @ +12 VDC 50 mA @ -12 VDC Voltage Tolerace = ±0.1 VDC
Operating Temperature Range	0° C to 70° C 0 to 95% Humidity (non-condensing)
Isolation	4,000 VAC (RS-232 to RS-422)
RS-232 Interface	25-pin, DB-25 female connector
RS-422/485 Interface	Screw terminals
Baud Rate	Up to 38,400 baud (Boards earlier than Rev.1 are limited to 19,200 baud)
RS-232 Distance	Up to 50 feet
RS-422/485 Distance	Up to 5,000 feet
Communications	RS-422 full duplex over two twisted pairs and a signal common. Shielded cable recommended. Does not support RS-485 2-wire mode (see AC7A/B)
Indicators	Transmit, Receive

Dimensions