

Issue 1.0

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L232422U.DOC

**PRODUCT L232422R**

**RS232 to RS422/485 converter**

**USER MANUAL**

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ANNEXURE 'A'      WIRING INTERFACE UNIT BLOCK DIAGRAM.

## 1. PRODUCT DESCRIPTION

### 1.1 GENERAL

The L232422R converts industry standard RS232 signals to RS422 or RS485. It can be powered by a variety of different power sources. The unit is housed in a metal enclosure.

### 1.2 SPECIAL FEATURES

The unit has been designed with a number of electronically “robust” features which include current and voltage protection at the RS232 and RS422 interfaces. The unit can also accommodate a number of different power sources, including 48V DC, 110V AC and 220V AC. Other voltages can be supplied on request. The unit is compact and can fit two aside on a 19”rack shelf with a height of 1U. The system uses the latest technology in line driving integrated circuits and is therefore complies fully with the stringent CCITT standards.

#### 1.2.1 INDICATIONS

The unit has three leds which indicate the following:

- |             |  |
|-------------|--|
| Power       | - indicates Power to the System            |
| Traffic out | - data being sent to the RS422 lines .     |
| Traffic in  | - data being received from the RS422 lines |



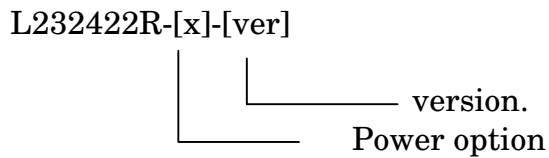
## 2. SYSTEM CONFIGURATION

### 2.1 FAMILY TREE and STOCK CODES.

The following table indicates the make up and various options of the product.

L232422R sub units	A	B
POWER SUPPLY	110/220V AC	48V DC
METAL BOX		
CONVERTER CARD	AU703	
DC INPUT CARD	AU704	
POWER CABLE	220V AC	48V DC

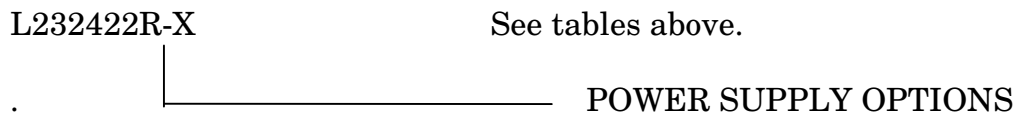
### 2.2 MODEL NUMBERS



#### POWER SUPPLY OPTION

Stock Code	Power Supply
D	220/110 VAC
C	48V DC

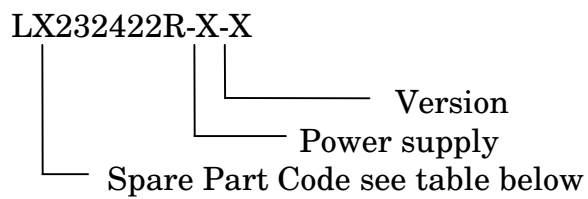
### 2.3 PRODUCT STOCK CODES.



L232422R-D.....110/220V AC  
 L232422R-C.....48V DC  
 L232422R USER.....L232422R-USER MANUAL.

## 2.4 SPARE PART CODES

Define stock code and add spare part code in second character position.



## SPARE PART OPTION

Spare Part Code	Description
A	RS232-RS422 CONVERTER CARD
B	METAL BOX COMPLETE
C	DC INPUT CARD
D	POWER CABLE

## 2.5 VERSION HISTORY

L232422R-D/C-/a - FIRST PRODUCTION VERSION

### **3. PREPARATION FOR USE**

#### **3.1 UNPACKING**

Check for physical damage caused during transportation. Return any damaged equipment.

#### **3.2 INSTALLATION**

Check the voltage supply matches that of the equipment before installation commences. Connect the power cable. The DC. power connections are shown on the rear panel. The equipment has no ON/OFF switch and is therefore active as soon as power is connected. When using 48V DC supply the internal AC power link must be removed.

Connect the data cables. Note the data directions with reference to the system diagram in Annexure 'A'.

Once a data signal has been injected into the RS232 port (DB25 connector) the 'TxD' led should light. The 'RxD' led should light on the unit receiving this data.

#### **3.3 COMMISSIONING**

If the link is correctly connected then data should be transferred smoothly. Should you experience problems follow the first line maintenance procedure in chapter 5.0

### **4. OPERATORS INSTRUCTIONS**

The unit needs no operator intervention to function. If a fault arises, it is necessary to observe the led indications and to perform such procedures as first line maintenance as described in the proceeding chapter.

See maintenance instructions for any other functions.

## 5. MAINTENANCE INSTRUCTIONS

No routine maintenance is required on this equipment.

### 5.1 INSTRUMENTS AND TOOLS REQUIRED

- Trend Tester
- Multimeter

### 5.2 FIRST LINE MAINTENANCE

When arriving at a suspect link it is always necessary to ensure that the unit has been correctly coupled (refer to block diagrams Annexure 'A') and to observe data flow on the TxD and RxD leds.

First observe the power indicator. If the power indicator is off then check if the supply voltage is correct for that particular power supply. The unit has a fuse on the converter board and also one in the kettle plug connector if the 110/220V AC option is used.. The DC unit has a fuse only on the inside. Replace faulty fuses with those of the correct value only.

Check that when data is being transmitted that the TxD led shows the activity and that there is a corresponding activity on the RxD led. Ensure that the RS422 cables have not been swapped i.e. Tx1 must be connected to Rx1 and Tx1bar to Rx1bar.

If problems still persist and the units are connected correctly then return them to the supplier for repair.

## 6. EXPLANATION OF TECHNICAL DIAGRAMS AND SOFTWARE

### 6.1 CONNECTING THE UNIT

Connect L232422R as shown in the block diagram Annexure 'A' Using a DB25 plug connector for the RS232 interface and the appropriate wiring connected to the 5pin terminal connector.

### 6.2 BASIC CIRCUIT OPERATION

Refer to block diagram on Annexure 'A'.

The circuit can operate in 2 modes:

1) The RS422 or 4wire mode. In this configuration the transmitted data and the received data each have their individual pairs of wires. As soon as data is present on the RS232 connector, it is converted, transmitted on the Tx1 and Tx1-bar wires, received at the second unit on the corresponding Rx1 and Rx1-bar terminals and reconverted back to RS232 and presented at the correct terminal. In this configuration data flow can be full duplex.

2) The RS485 or 2wire mode. In this configuration the transmitted and received data occurs on one pair of wires. which means that communications is half-duplex. Terminals 1/3 on the 5 pin terminal must be shorted together as well as terminals 2/4 (Tx1 to Rx1 and Tx1bar to Rx1bar). Only one unit can be active at any one time. In this mode a link also has to be made between pins 12/13 on the DB25 connector. This enables the RTS input (pin4) to control whether the line is enabled or not. A typical communications sequence would be: A unit needs to communicate. It detects that the line is not active. It raises the RTS line and thereby enables the RS485 link driver. Data is presented on the RS232 connector, appears on the RS485 link and is converted back to RS232 by all other units on the line and presented to their RS232 ports. The transmitting units completes the communication and lowers the RTS line disabling the RS485 link driver.

### 6.3 EXPLANATION OF CIRCUIT COMPONENTS

#### 6.3.1 RS422 to TTL Converter

IC 75176 - converts TTL signals to RS422 differential signals which are used to interface the L232422R to other units and also converts external RS422 differential signals back to TTL signals.

#### 6.3.2 TTL to RS232 level shifter

IC MAX232 - converts TTL signals to RS232 level signals which are used to interface the L232422R to external equipment and also converts external RS232 level signals back to TTL signals.

## 7. PHYSICAL AND ELECTRICAL SPECIFICATION

### 7.1 ELECTRICAL:

- \*Power Supply (5 Watt) - 115/230 VAC 50/60Hz  
- 48 VDC
- \*Data Standard Options - RS 422 / 485  
connection - 5 terminal connector
- \*Maximum distance - 2km @ 9600Baud.  
between units

### 7.2 FUNCTIONS AND CHARACTERISTICS:

- \*Indicators - Power, Transmit, Receive.
- \*Physical - Depth: 180mm      Height: 42mm  
Width: 202mm      Weight: 1.5 Kg  
- There is an optional special shelf available which accommodates 2 units side by side in a 1U high rack.
- \*Environmental conditions - Optional rack mounting or table top use.  
- Temperature: 0 - 40 degrees Celsius  
- Humidity: 0 - 95 % non-condensing

ANNEXURE 'A' WIRING INTERFACE UNIT BLOCK DIAGRAM.