



## XR16L651 Evaluation Board User's Manual

Rev 1.3

### Introduction

EXAR is proud to announce the XR16L651 single channel UART. The XR16L651 (48 pin TQFP package) is compatible to ST16C450/550/650A and XR16C850. The board will support all these devices in the 48-TQFP package when ordered from the factory. For a list of features, refer to the individual data sheets at [www.exar.com](http://www.exar.com).

The XR16L651 can work with the Exar's ST16C650A Windows driver (32-byte FIFO) as well as the standard Microsoft 550 Windows driver (16-byte FIFO). Please note that the Exar's ST16C650A driver does not utilize the enhanced features of either the XR16L651 or the ST16C650A. It is mainly intended to use the deeper FIFO (32 bytes).

### Description

In order to support the different devices, we have added several jumpers, which are factory selected for the selected device. ***It is advisable not to change these jumpers which could result in hardware failure and damage to the evaluation board.***

- Jumpers are provided to select one of COM 1/2/3/4 ports and IRQ3/4/5/7.
- The UART can operate at 2.5V, 3.3V or 5V selectable from the jumpers provided.
- The maximum data rate possible is 1Mbps via RS-232 and 2.5Mbps via RS-485.
- The option of infrared operation is available on XR16L651, XR16C850, and ST16C650A through either hardware (only XR16L651) or software selection.
- There is an option to select an external clock or the standard crystal 14.7456Mhz. The clock multiplier chip (ST49C101A-XX), 'U8' on the board (not installed), is used for factory external clock test.

**Warning: When installing the XR16L651 board, follow ESD Safety Procedures.**

The jumpers on the XR16L651 evaluation board are described below along with their default settings:

- J12-1 TXD1\_RS232 and J12-2 RXD1\_RS232 are open (**default**). These jumpers are used for local loop testing on the RS-232 side. When loop testing is needed, use header to select port. J12 1&2 to loop RS232 side.
- J13 1-TXD1 and J13 2-RX1 are open (**default**). When loop is need, move header to loop to J13 1&2 to loop on UART side.
- J11-1&2\_-RX, J11-3&4\_-TX, J11-5&6\_-RI, and J11-7&8\_-CTS (**default**) installed for RS-232 operation. For RS-485 operation, J11-1&2\_-RX, J11-3&4\_-TX, J11-5&6\_-RI, and J11-7&8\_-CTS should be left open.



- J3-1&2 is open (**default**). To reset the UART, J3-1&2 should be closed.
- J22 enables/disables the ENIR (enable infrared pin). J22 1&2 must be closed (**default**) to disable ENIR operation. The hardware pin ENIR is available only on the XR16L651. In the case of ST16C650A and XR16C850, the infrared mode can only be software-selected. Refer to the Table1 for control lines for the HSDL-2300 (U10, IrDA transceiver) setting.
- J15-1&2, J16-2&3 and J21-1,2&3 are all open (**default**). This is used for half duplex (RS-485 mode), which is enabled by setting bit-0 of the internal register XFR to “1”.

**Table 1.** IrDA Operation: Jumper Settings for the HSDL-2300.

Mode 0		Mode 1		FIR_SEL		RX Function	TX Function
(J16-2&3)	1	(J15-1&2)	0	(J21-1&2)	X	Shutdown	Shutdown
(J16-1&2)	0	(J15-1&2)	0	(J21-1&2)	0	SIR	Full Distance Power
(J16-1&2)	0	(J15-2&3)	1	(J21-1&2)	0	SIR	2/3 Distance Power
(J16-2&3)	1	(J15-2&3)	1	(J21-1&2)	0	SIR	1/3 Distance Power
(J16-1&2)	0	(J15-1&2)	0	(J21-2&3)	1	MIR/FIR	Full Distance Power
(J16-1&2)	0	(J15-2&3)	1	(J21-2&3)	1	MIR/FIR	2/3 Distance Power
(J16-2&3)	1	(J15-2&3)	1	(J21-2&3)	1	MIR/FIR	1/3 Distance Power

In order to use the evaluation board for the various devices (ST16C450, 550, 650A, XR16L651 and XR16C850), follow instructions on Table 2 to set the appropriate jumpers.

**Table 2.** Jumper Settings for the different devices (ST16C450, 550, 650A, XR16L651 and XR16C850).

XR16L651	ST16C 650A	ST16C550	ST16C450	XR16C850
J26-2&3	J26-1&2	J26-1&2	J26-1&2	J26-1&2
J27-2&3	J27-1&2	J27-1&2	J27-1&2	J27-1&2
J28-2&3	J28-1&2	J28-1&2	J28-1&2	J28-1&2
J29-2&3	J29-1&2	J29-1&2	J29-1&2	J29-1&2
J30-1&2	J30-2&3	J30-2&3	J30-2&3	J30-2&3
J31-2&3	J31-1&2	J31-1&2	J31-1&2	J31-1&2
J32-1&2	J32-2&3	J32-2&3	J32-2&3	J32-2&3
J33-1&2	J33-2&3	J33-2&3	J33-2&3	J33-2&3
J34-2&3	J34-1&2	J34-1&2	J34-1&2	J34-1&2
J35-2&3	J35-1&2	J35-1&2	J35-1&2	J35-1&2
J36-2&3	J36-1&2	J36-1&2	J36-1&2	J36-1&2
J37-2&3	J37-1&2	J37-1&2	J37-1&2	J37-1&2



- J25 and J24 are open **(default)**. This disables RS-485 transmission. J25-1&2\_TX and J25-3 to J24-1\_RX enables RS-485 transmission. J20 is the output header for the RS-485 transmission.
- For selecting other than factory settings for the VCC to the UART, look at Table 3 below:

**Table 3.** Jumper Settings to select VCC power supply for the UART.

<b>+5V</b>	<b>+3.3V</b>	<b>+2.5V</b>
J10-1&2 close, J9 open	J10-2&3 close, J9 open <b>(default)</b>	J9-1&2 close, J10 open

Turn off your computer and insert the XR16L651 board into a ISA slot. Plug the 9-pin cable (DB9) onto the XR16L651 board; hold the board in place while doing this.

The Null-Modem connections for the 9-pin cable are given below.

**Table 4.** Null-Modem Connections for the 9-pin cable (DB9).

<b>SIDE – A</b>	<b>SIDE - B</b>
TX- pin 3	RX- pin 2
RX- pin 2	TX- pin 3
CTS- pin 8	RTS- pin 7
RTS- pin 7	CTS- pin 8
GND- pin 5 & RI- pin 9	GND- pin 5 & RI- pin 9
DSR- pin 6 & DCD- pin 1	DTR- pin 4
DTR- pin 4	DSR- pin 6 & DCD- pin 1