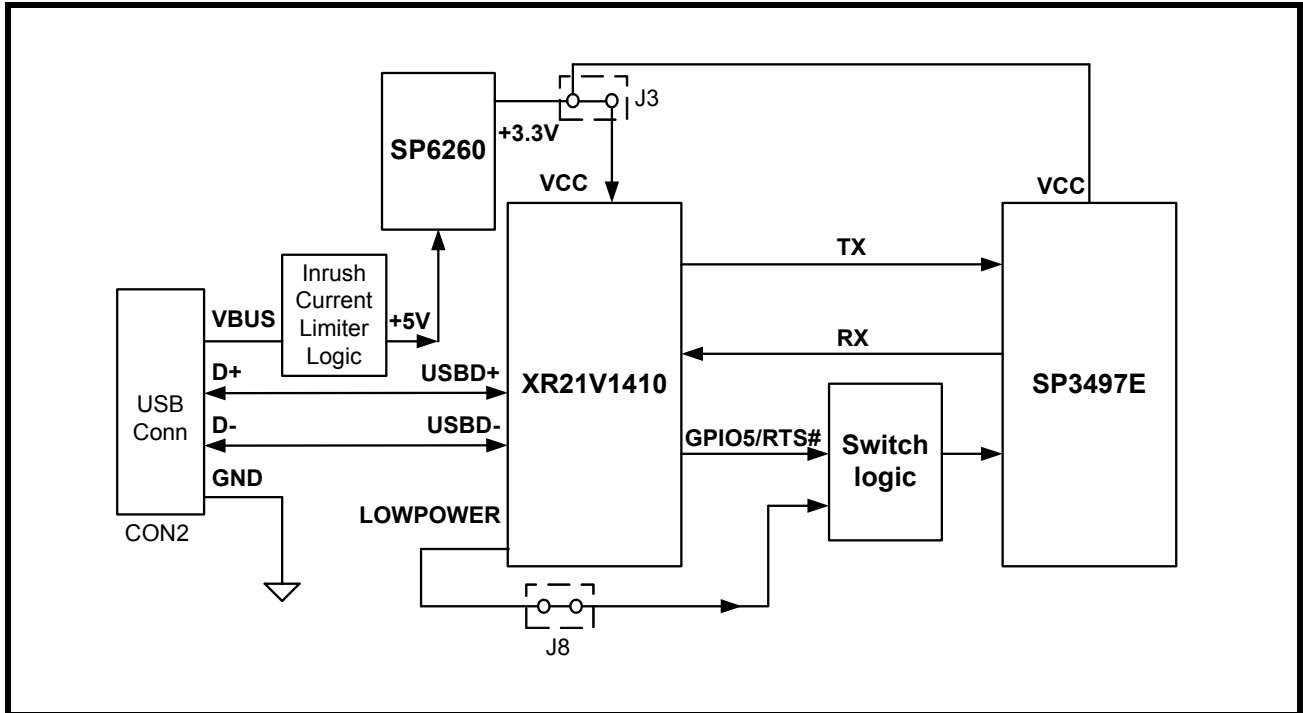### 1.0 INTRODUCTION

This user's manual is for the low cost XR21V1410 RS-485 evaluation board. The XR21V1410 is in the full-duplex RS-485 mode when it is shipped from the factory.

2.0 EVALUATION BOARD OVERVIEW

A block diagram of the evaluation board is shown in **Figure 1** below..

FIGURE 1. EVALUATION BOARD BLOCK DIAGRAM

The primary devices on the XR21V1410 evaluation board are all Exar devices.

- The XR21V1410 is a 1-ch USB UART.

- The SP6260 is an Exar LDO that regulates the +5V from VBUS to +3.3V that is used as the supply voltage of the SP3497E and the XR21V1410.

- The SP3497E is Exar's 32 Mbps RS-485 serial transceiver.

2.1 Evaluation Board Components

Table 1 shows where the Exar components are located and provides a brief description of some of the other components on the board.

TABLE 1: COMPONENTS OF THE XR21V1410 EVALUATION BOARD

UNIT	PART	FUNCTION
U1	SP6260GEK-L	Exar's 150mA RF Ultra Low Dropout Regulator used for converting +5V from VBUS to +3.3V for the SP3497E and VCC of the XR21V1410.
U4	XR21V1410IL16-F	Exar's 1-channel USB UART.
U6	AT24C02BN-SH-B-ND	I^2C Serial EEPROM. It is for storing Device ID and Vendor ID.
U7	AT24C02B-PU-DIP8	EEPROM socket (not installed).
U14	SN74LVC2G66DCT-SM8	Switch logic to enable/disable RS-485 transceiver.
U15	SP3497E	Exar's RS-485 transceiver.
CON2	USB_A31725	USB interface connector. It connects UART to USB bus.
SW1	Switch	Can be used to trigger remote wake-up event.

2.2 Description of Headers/Jumpers

This section describes the headers/jumpers on this evaluation board that are installed as well as the headers/jumpers that are not installed. Some headers/jumpers may not be installed because they are used for internal testing purposes only.   The headers/jumpers that are installed are highlighted in **Table 2** below.

TABLE 2: DESCRIPTION OF HEADERS/JUMPERS (INSTALLED)

JUMPERS	FUNCTIONS	COMMENTS
J2	Header to easily connect to an external board/device	All of the UART I/O signals are available on this header.
J4	Header to easily access the RS-485 signals	All of the RS-485 signals are available on this header.
J5	Enable half-duplex control	Default is full duplex control. Jumper is not installed.
J6	Header to easily access the RS-485 positive signals	RS-485_TX+ and RS-485_RX+ signals are available on this header. It can be used with J7 for loopback testing in full-duplex mode.
J7	Header to easily access the RS-485 negative signals	RS-485_TX- and RS-485_RX- signals are available on this header. It can be used with J6 for loopback testing in full-duplex mode.
JP4	Pull-up or pull down SCL signal	■ 1&2 pulls up the SCL signal. ■ 2&3 pulls down the SCL signal. (default)
JP5	Pull-up or pull down SDA signal	■ 1&2 pulls up the SDA signal. ■ 2&3 pulls down the SDA signal. (default)

NOTE: Pin 1 of all jumpers is designate by a square pad.

The headers/jumpers that are not installed are highlighted in **Table 3** below.

TABLE 3: DESCRIPTION OF HEADERS/JUMPERS (NOT INSTALLED)

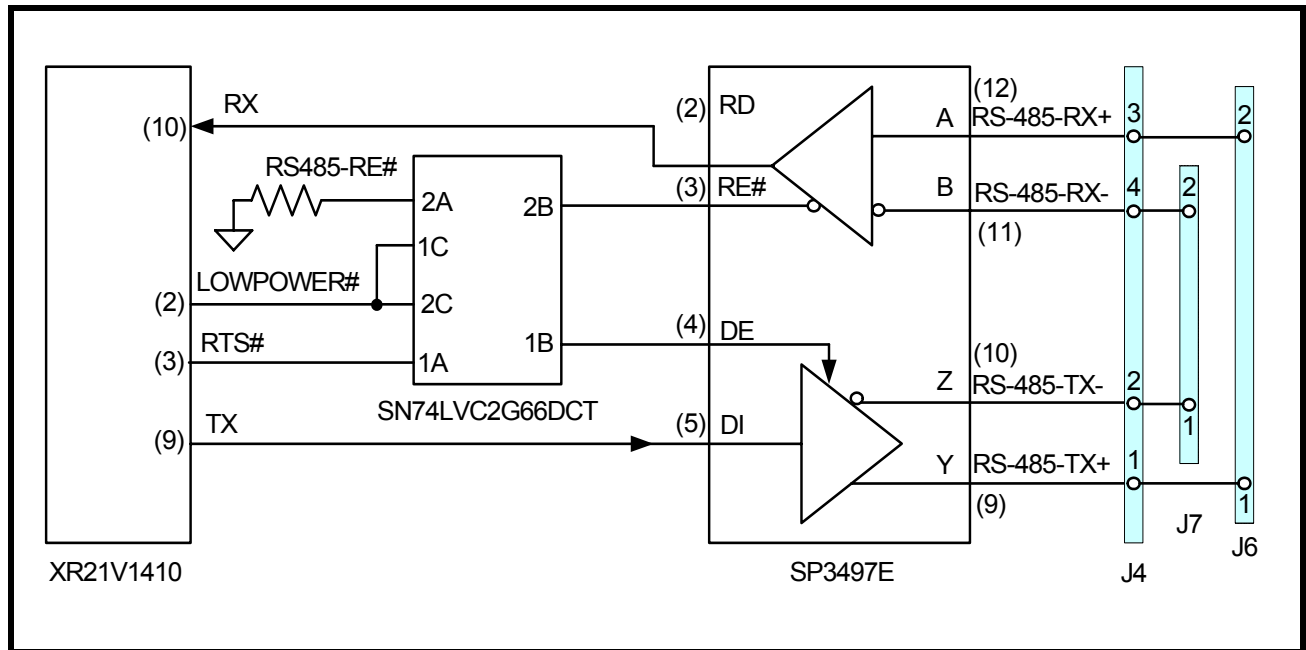| JUMPERS	FUNCTIONS	COMMENTS
J1	In house testing	Open.
J3	Power supply for XR21V1410	Trace between 1&2.
J8	Shut down/Enable switch logic circuit.	Trace between 1&2.
JP7	Connect SCL & SDA signals with EEPROM	■ 1&2 connects the SCL signal to EEPROM. ■ 3&4 connects the SDA signal to EEPROM.

3.0 BOARD CONFIGURATION

The evaluation board can be configured into both full-duplex and half-duplex RS-485 mode. Jumper J5 switches between the full-duplex and half-duplex RS-485 mode. When jumper J5 is installed, RTS# and RS485-RE# signals are the same, which enables/disables the driver and receiver of SP3497. Thus, it is the half-duplex mode. When jumper J5 is not installed, RTS# signal enables/disables the transmitter while RS485-RE# signal keeps the receiver enabled since it is LOW. Thus, it is the full-duplex mode.

3.1 Full-duplex RS-485 mode

Leaving jumper J5 open sets the board in the full-duplex mode. Full-duplex RS-485 mode is the default setting for the evaluation board (**Figure 2**). The SP3497E will be in full-duplex mode since the RS485-RE# pin will always be LOW (enabled). The RS-485 mode must be enabled from Exar's SERAL-TEST-USB GUI in order to transmit data.
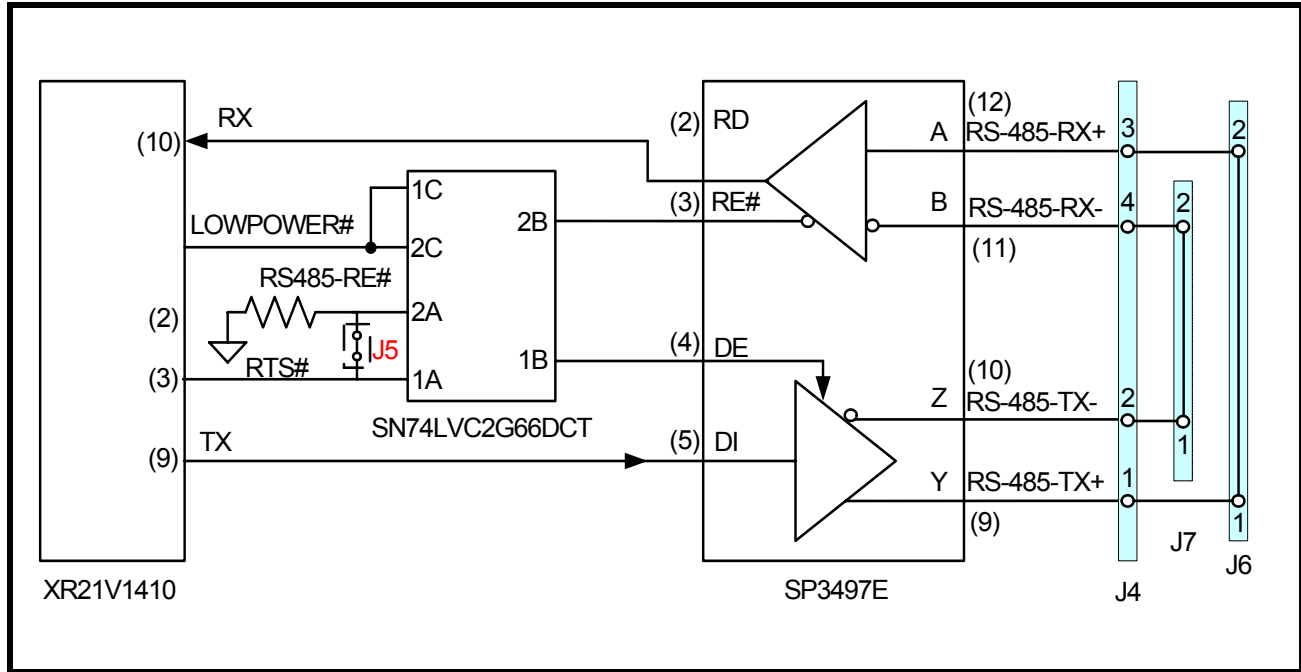
FIGURE 2. FULL-DUPLEX RS-485 MODE

3.2   *Half-duplex RS-485 mode*

Installing jumper J5 to enable the RTS# pin for the RS-485 half duplex control. J6 and J7 can be used for connecting TX+ to RX+ and TX- to RX- for half-duplex RS-485 mode.

FIGURE 3. HALF-DUPLEX RS-485 MODE

4.0   DRIVERS AND SUPPORT

For any questions about this evaluation board, software drivers or technical support, send an e-mail to uarttechsupport@exar.com.

NOTE: Revision 1.x board has an error: RTS# pin is connected to CTS# pin on the board. The shipped and schematic unit has been corrected. But the gerber file has not been corrected. If you would like to obtain the updated gerber file, please contact uarttechsupport@exar.com.

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