

Introduction

This user's manual is for the XR21B1420IL24-0A-EVB evaluation board. The XR21B1420IL24-F shares a common evaluation board with the XR21B1421IL28-F and XR21B1421IL24-F. The main difference between the XR21B1420 and the XR21B1421 is that the XR21B1421 is an HID USB UART. The XR21B1420 is a USB CDC-ACM/Custom Vendor Request device. The only USB UART device installed on the XR21B1420IL24-0A-EVB evaluation board is the XR21B1420IL24-F.

Table 1: Evaluation Board Ordering Part Numbers

Device Ordering Part Number	Evaluation Board Ordering Part Number	Device Package	Device Location
XR21B1421IL24-F	XR21B1421IL24-0A-EVB	24-pin QFN	U3
XR21B1421IL28-F	XR21B1421IL28-0A-EVB	28-pin QFN	U5
XR21B1420IL28-F	XR21B1420IL28-0A-EVB	28-pin QFN	U4

Evaluation Board Overview

A block diagram of the evaluation board is shown in [Figure 1](#) below.

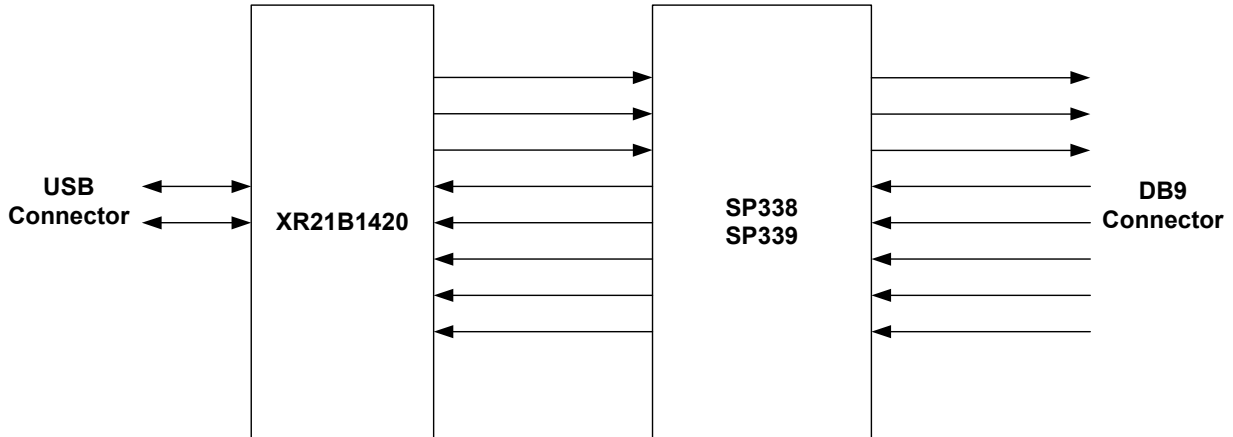


Figure 1: Evaluation Board Block Diagram

In addition to the XR21B1420IL28-F, there is an Exar SP339 Multiprotocol transceiver on this evaluation board. The SP339 can be configured for Loopback, RS-232, Half-Duplex RS-485 or Full-Duplex RS-485/422 Modes. The default setting when shipped from the factory is RS-232 mode.

[Figure 2](#) and [Figure 3](#) on the next page show the top view and bottom view of the evaluation board with all of the components, connectors and headers labeled.

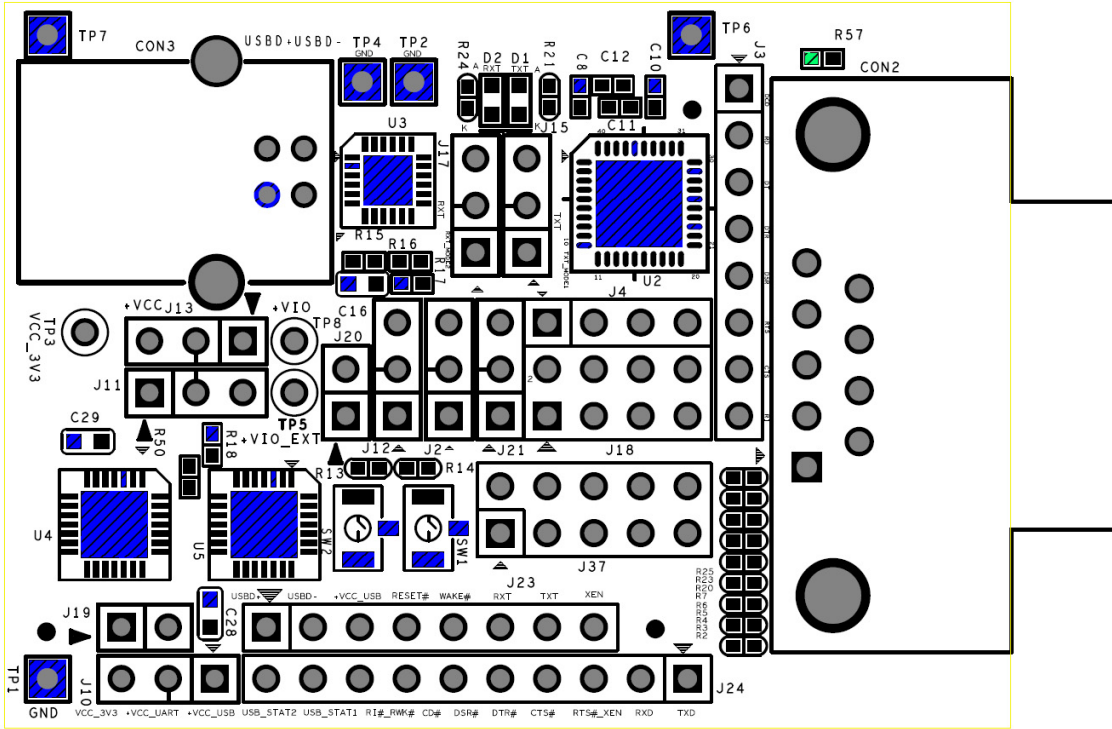


Figure 2: Top View of Evaluation Board

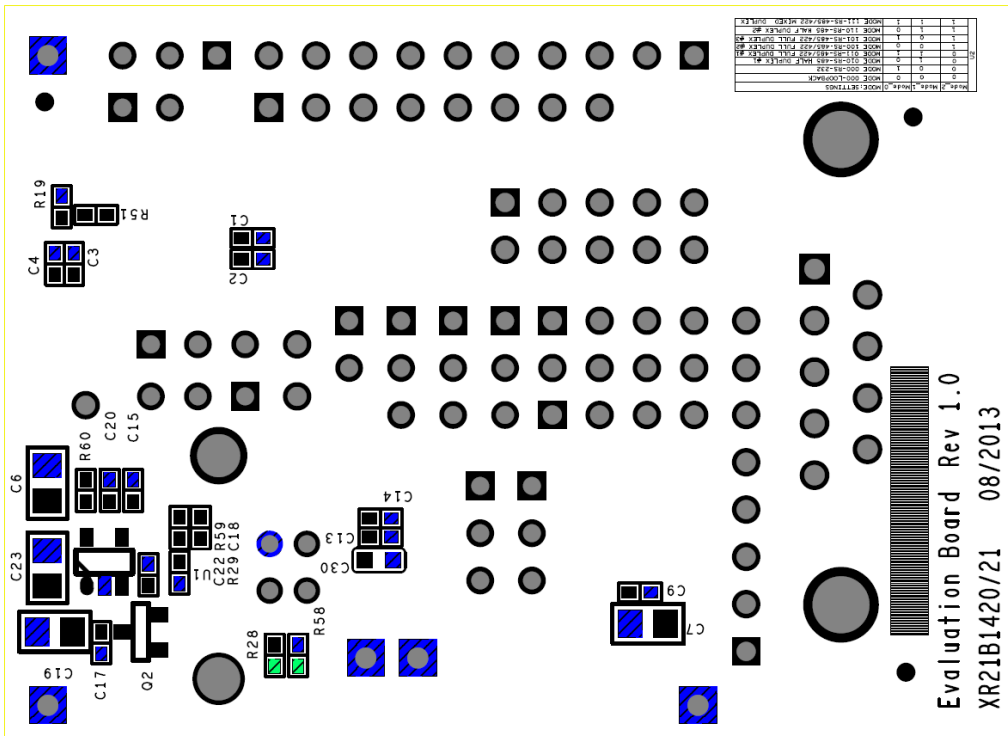


Figure 3: Bottom View of Evaluation Board

Hardware Configurations

This sections describes the default settings when shipped from the factory and what jumper setting changes are required when changing modes.

XR21B1420 Power Configurations

When shipped from the factory, the XR21B1420 is configured for bus-powered mode and uses the 5V from the USB VBUS pin. The default jumper settings are:

Table 2: Default Jumper Settings

Jumper Setting	Description
J10 - 1 & 2	Connects 5V from VBUS to VCC_REG (pin 7). A regulated 3.3V output will be available on VCC (pin 6).
J11	Not installed.
J13 - 2 & 3	Connects all pull-up resistors to 3.3V (+VCC_OUT = +VCC).
J19	Not installed.

If not using the 5V from VBUS, an external 3.3V can be supplied to the VCC_REG pin. For testing purposes, there is an Exar SP6260 regulator on board that can be used. The required jumper settings for 3.3V operation are as follows:

Table 3: Jumper Settings for 3.3V Operation

Jumper Setting	Description
J10 - 2 & 3	Connects 3.3V from SP6260 to VCC_REG (pin 7). 3.3V will also need to be supplied to VCC via J19.
J11	Not installed.
J13 - 2 & 3	Connects all pull-up resistors to 3.3V (+VCC_OUT = +VCC).
J19 - 1 & 2	Connects the regulated 3.3V from the SP6260 to the VCC pin of the XR21B1420.

GPIO Configurations

GPIO8/TXT

When shipped from the factory, the GPIO8/TXT pin is connected to the LED. The default configuration of this pin is the TXT function.

Table 4: Default Jumper Setting for GPIO8/TXT

Jumper Setting	Description
J15 - 2 & 3	GPIO8/TXT connected to LED D1. LED D1 toggles when data is transmitting.

Changing the header to J15 1&2 and adding a jumper on J16 3&4 will allow the GPIO8/TXT pin to control the MODE1 pin of the SP338/SP339 transceiver.

GPIO9/RXT

When shipped from the factory, the GPIO9/RXT pin is connected to the LED. The default configuration of this pin is the RXT function.

Table 5: Default Jumper Setting for GPIO9/RXT

Jumper Setting	Description
J17 - 2 & 3	GPIO9/RXT connected to LED D2. LED D2 toggles when data is received.

Changing the header to J17 1&2 and adding a jumper on J16 5&6 will allow the GPIO5/RXT pin to control the MODE2 pin of the SP338 transceiver (this is a 'NC' on the SP339).

GPIO0/RI#/RWK#

When shipped from the factory, the GPIO0/RI#/RWK# pin is connected to the push-button switch (SW1).

Table 6: Default Jumper Setting for GPIO0/RI#/RWK#

Jumper Setting	Description
J12 - 1 & 2	GPIO0/RI#/RWK# connected to SW1. Can be used for remote wake-up.

Changing the header to J12 2&3 will connect the GPIO0/RI#/RWK# pin to the SP338/SP339 transceiver.

GPIO2/DSR#

By default, the GPIO2/DSR# pin is a GPIO input for the XR21B1420. When shipped from the factory, J20 is installed. The GPIO2/DSR# pin can be configured as a GPIO output using the GPIO control registers. See datasheet for complete details.

SP338/SP339 Mode Selection

When shipped from the factory, the SP338/SP339 are configured in the RS-232 mode. This is achieved with a combination of J18 and J4.

J18 pins 2, 4 and 6 go to MODE0, MODE1 and MODE2, respectively. The SP338/SP339 have weak internal pull-down resistors. Table 7 shows the SP338/SP339 MODE pin configurations for the RS-232 mode.

Table 7: SP339 RS-232 Mode Configurations

Mode	Configuration
MODE0	1
MODE1	0
MODE2	0

For the RS-232 mode, there is a jumper from J18 pin 2 to J4 pin 1. Refer to the table in the schematic or the SP339 data-sheet for more details of the different configurations.

The SP338/339 transceiver is enabled with a jumper from J18 pin 8 to J4 pin 4.

Half-duplex, Full-Duplex and Mixed Duplex RS-485/422 modes

In the RS-485 half-duplex, full-duplex and mixed duplex modes, the DIR1 pin of the SP338/SP339 enables or disables the RS-485/422 line drivers. The DIR1 pin can be controlled by the XR21B1420 using the GPIO3/RS485 or GPIO1/RTS#/RS485 output pins. The GPIO7/RS485 or GPIO5/RTS#/RS485 pin can be selected via J21.

Software and Technical Support

Visit www.maxliner.com/XR21B1420 or www.maxlinear.com/XR21B1421 to download documentation and design tools including software, software drivers, evaluation board schematics, and evaluation board design files. Visit www.maxlinear.com/support/contact-us to search for regional contacts, knowledge-base articles, and submit new support requests.

Revision History

Revision	Date	Description
1A	August 2014	Initial release.
1B	January 2020	Add MaxLinear logo and edit "Software and Technical Support" section.



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