



INTRODUCTION

This user's manual is for the XRA1402/1404 8-bit evaluation board. Table 1 shows the different devices and packages that the evaluation board supports. This user's manual will describe the hardware setup required to operate the different packages.

1.0 QUICK START

To verify communication with the GPIO expander, the following steps are recommended:

- 1.1 Connect external +5V power supply to J8 pin 1**
- 1.2 Connect J12 pin 13 and 14 to ground of external power supply**
- 1.3 Connect to MCU SPI interface for:**

SPI clock (SCK_SCL signal at J5 pin11)

SO (SO_SPI signal at J5 pin17)

SI (SI_SPI signal at J5 pin21)

CS# (CS#_SPI signal at J5 pin19)

- 1.4 From the MCU, write the following registers:**

GCR = 0x00

If the LEDs turn on, the communication with the GPIO expander is successful.

To disable connection to LEDs, remove jumpers on J41 and J42. Connect to external inputs or outputs at J1.

2.0 HARDWARE SETUP

2.1 Packages description

The evaluation board supports all 4 packages of the XRA1402 and XRA1404. The ordering part number, package and location on the board is shown below in Table 1. Table 2 lists the evaluation board ordering part numbers.

TABLE 1: PACKAGE LIST

ORDERING PART NUMBER	PACKAGE	LOCATION
XRA1402IL16-F	16-pin QFN	U7
XRA1402IG16-F	16-pin TSSOP	U6
XRA1404IL16-F	16-pin QFN	U7
XRA1404IG16-F	16-pin TSSOP	U6

TABLE 2: EVALUATION BOARD ORDERING PART NUMBERS

PART NUMBER
XRA1402IL16-0B-EB
XRA1402IG16-0B-EB
XRA1404IL16-0B-EB
XRA1404IG16-0B-EB

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2.2 Jumper Settings
2.2.1 Common Jumpers

The following jumpers apply to all the 8 packages of XRA1402 and XRA1404:

TABLE 3: COMMON JUMPER SETTINGS

JUMPERS	FUNCTIONS	COMMENTS
J8	Selects the supply voltage to generate the +1.8V power supply for the board	1&2 selects +5V (default, Pin 1 -- Test point for external +5V) 2&3 selects +P <i>NOTE: Not installed. Trace between 1 & 2.</i>
J9	Selects the supply voltage to generate the +2.5V power supply for the board	1&2 selects +5V (default) 2&3 selects +P <i>NOTE: Not installed. Trace between 1 & 2.</i>
J13	Selects the supply voltage to generate the +3.3V power supply for the board	1&2 selects +5V (default) 2&3 selects +P <i>NOTE: Not installed. Trace between 1 & 2.</i>
J10	Selects the supply voltage for +VDDP	Used only for the XRA1404 Jumper in 1&2 selects +3.3V Jumper in 3&4 selects +2.5V Jumper in 5&6 selects +1.8V
J11	Selects the supply voltage for +VDD	Jumper in 1&2 selects +3.3V (default) Jumper in 3&4 selects +2.5V Jumper in 5&6 selects +1.8V
J12	Not used for XRA140x	Installed but not used
J14	Not used for XRA140x	Installed but not used
J6	Not used	Installed but not used
J34	LEDs	<i>NOTE: Not installed. Pin 2 is connected to GND.</i>
J1	Header for testing GPIOs of both TSSOP and QFN package	Installed. Connect to external input/output after removing jumpers on J41 and J42.
J2	Header for internal test	Not installed
J5	Header for XRA1402 and XRA1404 signals and spare signals	Installed. Connect SPI signals from this header to MCU.
J7	Header for UART signals and spare signals	Not installed. Some GPIO signals and spare signals are accessible at this header

2.2.2 XRA1402IL16-F

The following jumpers apply to the XRA1402IL16-F:

TABLE 4: JUMPER SETTINGS FOR XRA1402IL16-F

JUMPERS	FUNCTIONS	COMMENTS
J41	Header for connecting GPIO signals of TSSOP package to LEDs	1&2 connects GPIO0 to LED - 0 ohm resistor on board 3&4 connects GPIO1 to LED - 0 ohm resistor on board 5&6 connects GPIO2 to LED - 0 ohm resistor on board 7&8 connects GPIO3 to LED - 0 ohm resistor on board 9&10 connects GPIO4 to LED - 0 ohm resistor on board 11&12 connects GPIO5 to LED - 0 ohm resistor on board 13&14 connects GPIO6 to LED - 0 ohm resistor on board 15&16 connects GPIO7 to LED - 0 ohm resistor on board
J42	Header for connecting GPIO signals of QFN package	Jumper in pin 1 & J41 pin 1 connects GPIO0 to LED Jumper in pin 2 & J41 pin 3 connects GPIO1 to LED Jumper in pin 3 & J41 pin 5 connects GPIO2 to LED Jumper in pin 4 & J41 pin 7 connects GPIO3 to LED Jumper in pin 5 & J41 pin 9 connects GPIO4 to LED Jumper in pin 6 & J41 pin 11 connects GPIO5 to LED Jumper in pin 7 & J41 pin 13 connects GPIO6 to LED Jumper in pin 8 & J41 pin 15 connects GPIO7 to LED
J61	Selects the supply voltage for +VDD for 16-pin QFN packages	Jumper in 2&4 selects +VDD (default) Jumper in 1&3 selects +VDD Jumper in 3&5 selects +VDD
J62	Selects the corresponding signal for pin 15 of 16-pin QFN package	Jumper in 2&4 selects CS# signal (default) Jumper in 1&3 selects A0 signal Jumper in 3&5 selects A0 signal
J63	Selects the corresponding signal for pin 16 of 16-pin QFN package	Jumper in 2&4 selects SI signal (default) Jumper in 1&3 selects A1 signal Jumper in 3&5 selects A1 signal
J64	Selects the corresponding signal for pin 1 of 16-pin QFN package	Jumper in 2&4 selects RESET# signal (default) Jumper in 1&3 selects A2 signal Jumper in 3&5 selects RESET# signal
J65	Selects the corresponding signal for pin 13 of 16-pin QFN package	Jumper in 2&4 selects SO signal (default) Jumper in 1&3 selects SDA signal Jumper in 3&5 selects SDA signal
J66	Selects the supply voltage for +VDDP for 16-pin QFN packages	Installed but not used for XRA1402IL16-F Jumper in 1&2 selects +VDDP Jumper in 2&3 selects +VDDP
J67	Selects the corresponding signal for pin 15 of 16-pin QFN package	Installed but not used for XRA1402IL16-F Jumper in 1&2 selects +VDD Jumper in 2&3 selects +VDD
J68	Selects the corresponding signal for pin 16 of 16-pin QFN package	Installed but not used for XRA1402IL16-F Jumper in 1&2 selects A0 signal Jumper in 2&3 selects CS# signal

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TABLE 4: JUMPER SETTINGS FOR XRA1402IL16-F

JUMPERS	FUNCTIONS	COMMENTS
J69	Selects the corresponding signal for pin 1 of 16-pin QFN package	Installed but not used for XRA1402IL16-F Jumper in 1&2 selects RESET# signal Jumper in 2&3 selects SI signal
J70	Selects the corresponding signal for pin 13 of 16-pin QFN package	Installed but not used for XRA1402IL16-F Jumper in 1&2 selects SDA signal Jumper in 2&3 selects SO signal
J49, J50, J51, J52, J53, J54, J55, J56, J57, J58	Not used for XRA1402IL16-F	Not installed

2.2.3 XRA1402IG16-F

The following jumpers apply to the XR1402IG16-F:

TABLE 5: JUMPER SETTINGS FOR XRA1402IG16-F

JUMPERS	FUNCTIONS	COMMENTS
J41	Header for connecting GPIO signals of TSSOP package to LEDs	Jumper in 1&2 connects GPIO0 to LED Jumper in 3&4 connects GPIO1 to LED Jumper in 5&6 connects GPIO2 to LED Jumper in 7&8 connects GPIO3 to LED Jumper in 9&10 connects GPIO4 to LED Jumper in 11&12 connects GPIO5 to LED Jumper in 13&14 connects GPIO6 to LED Jumper in 15&16 connects GPIO7 to LED
J42	Header for connecting GPIO signals of QFN package	Not installed
J49	Selects the supply voltage for +VDD for 16-pin TSSOP packages	Jumper in 2&4 selects +VDD (default) Jumper in 1&3 selects +VDD Jumper in 3&5 selects +VDD
J50	Selects the corresponding signal for pin 1 of 16-pin TSSOP package	Jumper in 2&4 selects CS# signal (default) Jumper in 1&3 selects A0 signal Jumper in 3&5 selects A0 signal
J51	Selects the corresponding signal for pin 2 of 16-pin TSSOP package	Jumper in 2&4 selects SI signal (default) Jumper in 1&3 selects A1 signal Jumper in 3&5 selects A1 signal
J52	Selects the corresponding signal for pin 3 of 16-pin TSSOP package	Jumper in 2&4 selects RESET# signal (default) Jumper in 1&3 selects A2 signal Jumper in 3&5 selects RESET# signal
J53	Selects the corresponding signal for pin 15 of 16-pin TSSOP package	Jumper in 2&4 selects SO signal (default) Jumper in 1&3 selects SDA signal Jumper in 3&5 selects SDA signal
J54	Selects the supply voltage for +VDDP for 16-pin TSSOP packages	Installed but not used for XRA1402IG16-F Jumper in 1&2 selects +VDDP Jumper in 2&3 selects +VDDP
J55	Selects the corresponding signal for pin 1 of 16-pin TSSOP package	Installed but not used for XRA1402IG16-F Jumper in 1&2 selects +VDD Jumper in 2&3 selects +VDD
J56	Selects the corresponding signal for pin 2 of 16-pin TSSOP package	Installed but not used for XRA1402IG16-F Jumper in 1&2 selects A0 signal Jumper in 2&3 selects CS# signal
J57	Selects the corresponding signal for pin 3 of 16-pin TSSOP package	Installed but not used for XRA1402IG16-F Jumper in 1&2 selects RESET# signal Jumper in 2&3 selects SI signal

TABLE 5: JUMPER SETTINGS FOR XRA1402IG16-F

JUMPERS	FUNCTIONS	COMMENTS
J58	Selects the corresponding signal for pin 15 of 16-pin TSSOP package	Installed but not used for XRA1402IG16-F Jumper in 1&2 selects SDA signal Jumper in 2&3 selects SO signal
J61, J62, J63, J64, J65, J66, J67, J68, J69, J70	Not used for XRA1402IG16-F	Not installed

2.2.4 XRA1404IL16-F

The following jumpers apply to the XRA1404IL16-F:

TABLE 6: JUMPER SETTINGS FOR XRA1404IL16-F

JUMPERS	FUNCTIONS	COMMENTS
J41	Header for connecting GPIO signals of TSSOP package to LEDs	1&2 connects GPIO0 to LED - 0 ohm resistor on board 3&4 connects GPIO1 to LED - 0 ohm resistor on board 5&6 connects GPIO2 to LED - 0 ohm resistor on board 7&8 connects GPIO3 to LED - 0 ohm resistor on board 9&10 connects GPIO4 to LED - 0 ohm resistor on board 11&12 connects GPIO5 to LED - 0 ohm resistor on board 13&14 connects GPIO6 to LED - 0 ohm resistor on board 15&16 connects GPIO7 to LED - 0 ohm resistor on board
J42	Header for connecting GPIO signals of QFN package	Jumper in pin 1 & J41 pin 1 connects GPIO0 to LED Jumper in pin 2 & J41 pin 3 connects GPIO1 to LED Jumper in pin 3 & J41 pin 5 connects GPIO2 to LED Jumper in pin 4 & J41 pin 7 connects GPIO3 to LED Jumper in pin 5 & J41 pin 9 connects GPIO4 to LED Jumper in pin 6 & J41 pin 11 connects GPIO5 to LED Jumper in pin 7 & J41 pin 13 connects GPIO6 to LED Jumper in pin 8 & J41 pin 15 connects GPIO7 to LED
J61	Selects the supply voltage for +VDD for 16-pin QFN packages	Installed but not used for XRA1404IL16-F Jumper in 1&3 selects +VDD Jumper in 3&5 selects +VDD Jumper in 2&4 selects +VDD
J62	Selects the corresponding signal for pin 15 of 16-pin QFN package	Installed but not used for XRA1404IL16-F Jumper in 1&3 selects A0 signal Jumper in 3&5 selects A0 signal Jumper in 2&4 selects CS# signal
J63	Selects the corresponding signal for pin 16 of 16-pin QFN package	Installed but not used for XRA1404IL16-F Jumper in 1&3 selects A1 signal Jumper in 3&5 selects A1 signal Jumper in 2&4 selects SI signal
J64	Selects the corresponding signal for pin 1 of 16-pin QFN package	Installed but not used for XRA1404IL16-F Jumper in 1&3 selects A2 signal Jumper in 3&5 selects RESET# signal Jumper in 2&4 selects RESET# signal
J65	Selects the corresponding signal for pin 13 of 16-pin QFN package	Installed but not used for XRA1404IL16-F Jumper in 1&3 selects SDA signal Jumper in 3&5 selects SDA signal Jumper in 2&4 selects SO signal
J66	Selects the supply voltage for +VDDP for 16-pin QFN packages	Jumper in 2&3 selects +VDDP (default) Jumper in 1&2 selects +VDDP
J67	Selects the corresponding signal for pin 15 of 16-pin QFN package	Jumper in 2&3 selects +VDD (default) Jumper in 1&2 selects +VDD
J68	Selects the corresponding signal for pin 16 of 16-pin QFN package	Jumper in 2&3 selects CS# signal (default) Jumper in 1&2 selects A0 signal

TABLE 6: JUMPER SETTINGS FOR XRA1404IL16-F

JUMPERS	FUNCTIONS	COMMENTS
J69	Selects the corresponding signal for pin 1 of 16-pin QFN package	Jumper in 2&3 selects SI signal (default) Jumper in 1&2 selects RESET# signal
J70	Selects the corresponding signal for pin 13 of 16-pin QFN package	Jumper in 2&3 selects SO signal (default) Jumper in 1&2 selects SDA signal
J49, J50, J51, J52, J53, J54, J55, J56, J57, J58	Not used for XRA1404IL16-F	Not installed

2.2.5 XRA1404IG16-F

The following jumpers apply to the XR1404IG16-F:

TABLE 7: JUMPER SETTINGS FOR XRA1404IG16-F

JUMPERS	FUNCTIONS	COMMENTS
J41	Header for connecting GPIO signals of TSSOP package to LEDs	Jumper in 1&2 connects GPIO0 to LED Jumper in 3&4 connects GPIO1 to LED Jumper in 5&6 connects GPIO2 to LED Jumper in 7&8 connects GPIO3 to LED Jumper in 9&10 connects GPIO4 to LED Jumper in 11&12 connects GPIO5 to LED Jumper in 13&14 connects GPIO6 to LED Jumper in 15&16 connects GPIO7 to LED
J42	Header for connecting GPIO signals of QFN package	Not installed
J49	Selects the supply voltage for +VDD for 16-pin TSSOP packages	Installed but not used for XRA1404IG16-F Jumper in 1&3 selects +VDD Jumper in 3&5 selects +VDD Jumper in 2&4 selects +VDD
J50	Selects the corresponding signal for pin 1 of 16-pin TSSOP package	Installed but not used for XRA1404IG16-F Jumper in 1&3 selects A0 signal Jumper in 3&5 selects A0 signal Jumper in 2&4 selects CS# signal
J51	Selects the corresponding signal for pin 2 of 16-pin TSSOP package	Installed but not used for XRA1404IG16-F Jumper in 1&3 selects A1 signal Jumper in 3&5 selects A1 signal Jumper in 2&4 selects SI signal
J52	Selects the corresponding signal for pin 3 of 16-pin TSSOP package	Installed but not used for XRA1404IG16-F Jumper in 1&3 selects A2 signal Jumper in 3&5 selects RESET# signal Jumper in 2&4 selects RESET# signal
J53	Selects the corresponding signal for pin 15 of 16-pin TSSOP package	Installed but not used for XRA1404IG16-F Jumper in 1&3 selects SDA signal Jumper in 3&5 selects SDA signal Jumper in 2&4 selects SO signal
J54	Selects the supply voltage for +VDDP for 16-pin TSSOP packages	Jumper in 2&3 selects +VDDP (default) Jumper in 1&2 selects +VDDP
J55	Selects the corresponding signal for pin 1 of 16-pin TSSOP package	Jumper in 2&3 selects +VDD (default) Jumper in 1&2 selects +VDD
J56	Selects the corresponding signal for pin 2 of 16-pin TSSOP package	Jumper in 2&3 selects CS# signal (default) Jumper in 1&2 selects A0 signal
J57	Selects the corresponding signal for pin 3 of 16-pin TSSOP package	Jumper in 2&3 selects SI signal (default) Jumper in 1&2 selects RESET# signal

TABLE 7: JUMPER SETTINGS FOR XRA1404IG16-F

JUMPERS	FUNCTIONS	COMMENTS
J58	Selects the corresponding signal for pin 15 of 16-pin TSSOP package	Jumper in 2&3 selects SO signal (default) Jumper in 1&2 selects SDA signal
J61, J62, J63, J64, J65, J66, J67, J68, J69, J70	Not used for XRA1404IG16-F	Not installed

3.0 TECHNICAL SUPPORT

If there are any questions, please send an e-mail to uarttechsupport@exar.com.

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