Expanders

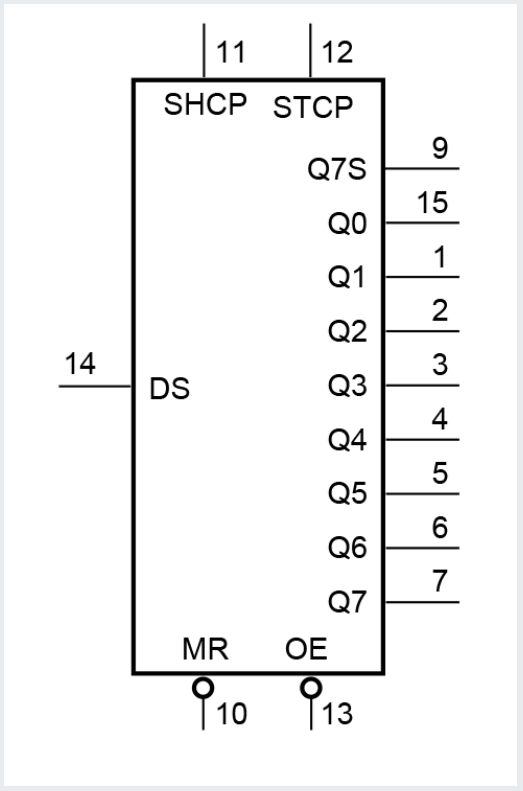
Tiger City IMX Industrial Computer with Linux OS

- Expander A
- Expander B
- Expander C
- Expander D
- Expander E
- Expander F

Expander A

Part number: **74HC595BQ**

Expander A diagram



Expander A pins description

Pin	Type	Usage	User-space name	Description
1	Q1	DO1	gpiochip8 1	Digital output 1
2	Q2	DO2	gpiochip8 2	Digital output 2
3	Q3	DO3	gpiochip8 3	Digital output 3
4	Q4	DO4	gpiochip8 4	Digital output 4
5	Q5	DO5	gpiochip8 5	Digital output 5
6	Q6	DO6	gpiochip8 6	Digital output 6
7	Q7	DO7	gpiochip8 7	Digital output 7
9	Q7S	NC	X	Not connected
10	MR/	NRST_GLOBAL	X	Reset
11	SHCP	SPI1_SCLK	X	SPI clock

Pin	Type	Usage	User-space name	Description
12	STCP	SPI1_CS1	X	SPI chip select
13	OE/	GND	X	Output enable
14	DS	SPI1_MOSI	X	SPI master out slave in
15	Q0	MUX_DIO_SEL	gpiochip8 0	MUX_PWM selection signal
16	VCC	+3V3	X	Power supply

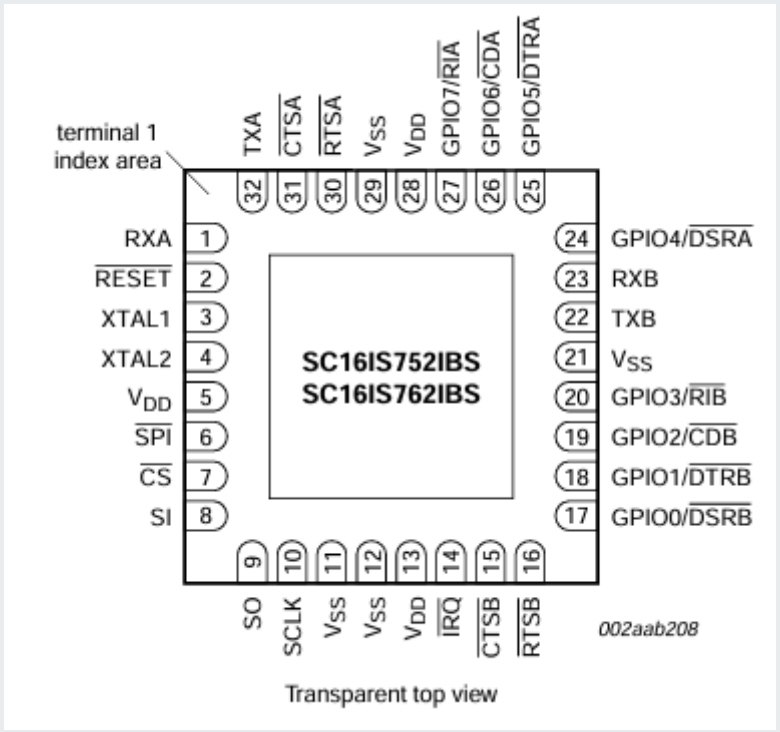
SPI1

Signal	Processor pin	Default function
Chip select 0	AD18	SPI1_CS0
Chip select 1	AG23	SPI1_CS1
Master in slave out	A7	SPI1_MISO
Clock	D6	SPI1_SCLK
Master out slave in	B7	SPI1_MOSI

Expander B

Part number: **SC16IS752IBS**

Expander B diagram



Expander B pins description

Pin	Type	Usage	User-space name	Description
1	RXA(I)	RS485_UART1_RX	X	RS485 UART1 RX
2	RESET/	RS485_NRST	X	Reset
3	XTAL1(I)	TXCO_OUT	X	Oscillator output
4	XTAL2(O)	NC	X	Not connected
5	VDD	+3V3	X	Power supply
6	I2C / SPI/	GND	X	Ground
7	CS/ / A0	SPI2_CS1	X	SPI chip select
8	SI / A1	SPI2_MOSI	X	SPI master out slave in
9	SO	SPI2_MISO	X	SPI master in slave out
10	SCL / SCLK	SPI2_SCLK	X	SPI clock
11	SDA / VSS	GND	X	Ground

Pin	Type	Usage	User-space name	Description
12	VSS	GND	X	Ground
14	IRQ/	RS485_INT	X	RS485 interrupt
15	CTSB/	NC	X	Not connected
16	RTSB/	RS485_UART2_RTS	X	RS485 UART2 RTS
17	GPIO0 / DSRB/	NC	X	Not connected
18	GPIO1 / DTRB/	NC	X	Not connected
19	GPIO2 / CDB/	NC	X	Not connected
20	GPIO3 / RIB/	NC	X	Not connected
22	TXB(O)	RS485_UART2_TX	X	RS485 UART2 TX
23	RXB(I)	RS485_UART2_RX	X	RS485 UART2 RX
24	GPIO4 / DSRA/	NC	X	Not connected
25	GPIO5 / DTRA/	NC	X	Not connected
26	GPIO6 / CDA/	NC	X	Not connected
27	GPIO7 / RIA/	NC	X	Not connected
30	RTSA/	RS485_UART1_RTS	X	RS485 UART1 RTS
31	CTSA/	NC	X	Not connected
32	TXA(O)	RS485_UART1_TX	X	RS485 UART1 TX

SPI2

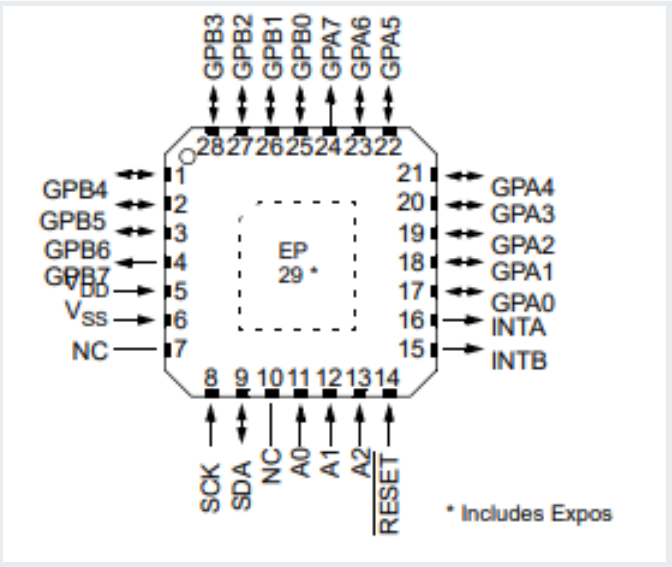
Signal	Processor pin	Default function

Chip select 0	A6	SPI2_CS0
Chip select 1	AF12	SPI2_CS1
Chip select 2	AB19	SPI2_CS2
Master in slave out	A8	SPI2_MISO
Clock	E6	SPI2_SCLK
Master out slave in	B8	SPI2_MOSI

Expander C

Part number: **MCP23017-E/ML**

Expander C diagram



Expander C pins description

Pin	Port	Type	User-space name	Description
1	GPB4	GPIO	gpiochip5 12	UIO4 voltage
2	GPB5	GPIO	gpiochip5 13	UIO4 current
3	GPB6	GPIO	gpiochip5 14	UIO4 resistance
4	GPB7	GPIO	gpiochip5 15	UIO3 resistance

Pin	Port	Type	User-space name	Description
5	VDD	+3V3	X	Power supply
6	VSS	GND	X	Ground
7	NC	NC	X	Not connected
8	SCK	GPIO	X	I2C clock
9	SDA	GPIO	X	I2C data
10	NC	NC	X	Not connected
11	A0	GND	X	Address bit 0
12	A1	GND	X	Address bit 1
13	A2	GND	X	Address bit 2
14	RESET/	EXP2_NRST	X	Reset
15	INTB	NC	X	Not connected
16	INTA	NC	X	Not connected
17	GPA0	GPIO	gpiochip5 0	UIO2 resistance
18	GPA1	GPIO	gpiochip5 1	UIO1 resistance
19	GPA2	GPIO	gpiochip5 2	UIO1 voltage
20	GPA3	GPIO	gpiochip5 3	UIO2 voltage
21	GPA4	GPIO	gpiochip5 4	UIO3 voltage
22	GPA5	GPIO	gpiochip5 5	UIO1 current
23	GPA6	GPO	gpiochip5 6	UIO4 I source

Pin	Port	Type	User-space name	Description
24	GPA7	GPIO	gpiochip5 7	UIO3 current
25	GPB0	GPIO	gpiochip5 8	UIO2 current
26	GPB1	GPO	gpiochip5 9	UIO1 I source
27	GPB2	GPO	gpiochip5 10	UIO2 I source
28	GPB3	GPO	gpiochip5 11	UIO3 I source

I2C2

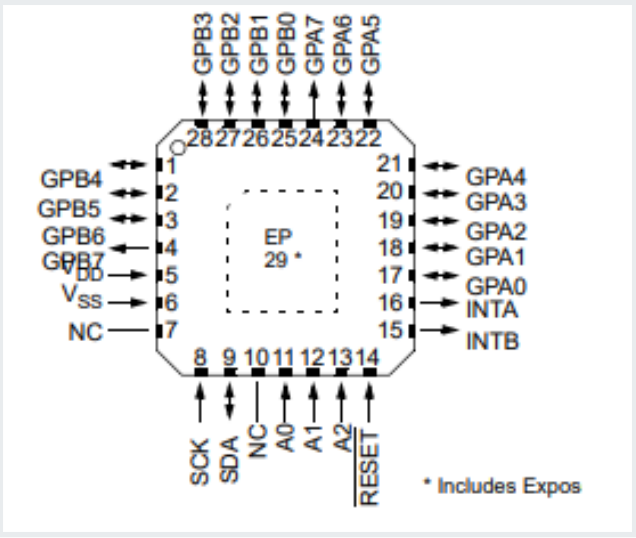
Device name: **/dev/i2c-1**

Signal	Processor pin	Default function
Clock	D10	I2C2_SCL
Data	D9	I2C2_SDA

Expander D

Part number: **MCP23017**

Expander D diagram



Expander D pins description

Pin	Port	Type	User-space name	Description
1	GPB4	GPO	gpiochip6 12	LED3 BLUE ON / OFF
2	GPB5	GPO	gpiochip6 13	LED4 GREEN ON / OFF
3	GPB6	GPO	gpiochip6 14	OLED ON / OFF
4	GPB7	GPO	gpiochip6 15	LED4 BLUE ON / OFF
5	VDD	+3V3	X	Power supply
6	VSS	GND	X	Ground
7	NC1	NC	X	Not connected
8	SCK	GPIO	X	I2C clock
9	SDA	GPIO	X	I2C data
10	NC2	NC	X	Not connected
11	A0	GND	X	Address bit 0
12	A1	GND	X	Address bit 1
13	A2	GND	X	Address bit 2
14	RESET/	NRST_GLOBAL	X	Reset
15	INTB	HMI_IRQ	X	Interrupt B
16	INTA	HMI_IRQ	X	Interrupt A
17	GPA0	GPI	gpiochip6 0	Joystick left input
18	GPA1	GPI	gpiochip6 1	Joystick up input
19	GPA2	GPI	gpiochip6 2	Joystick down input

Pin	Port	Type	User-space name	Description
20	GPA3	GPI	gpiochip6 3	Joystick right input
21	GPA4	GPI	gpiochip6 4	Joystick push input
22	GPA5	GPO	gpiochip6 5	LED3 RED ON / OFF
23	GPA6	GPI	gpiochip6 6	DIP switch 6 input
24	GPA7	GPI	gpiochip6 7	DIP switch 7 input
25	GPB0	GPI	gpiochip6 8	DIP switch 8 input
26	GPB1	GPO	gpiochip6 9	LED 5 V power supply ON / OFF
27	GPB2	GPO	gpiochip6 10	LED3 GREEN ON / OFF
28	GPB3	GPO	gpiochip6 11	LED4 RED ON / OFF

I2C3

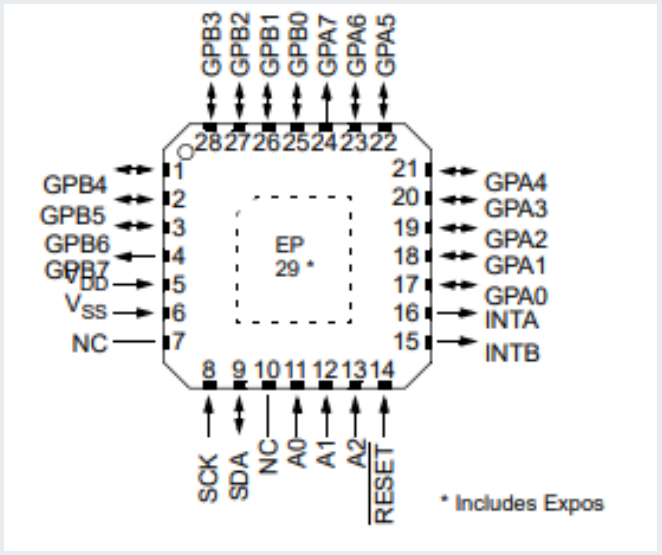
Device name: **/dev/i2c-2**

Signal	Processor pin	Default function
Clock	E10	I2C3_SCL
Data	F10	I2C3_SDA

Expander E

Part number: **MCP23017-E/ML**

Expander E diagram



Expander E pins description

Pin	Port	Type	User-space name	Description
1	GPB4	GPI	gpiochip5 12	Digital input 4 (DIO circuit)
2	GPB5	GPI	gpiochip5 13	Digital input 5 (DIO circuit)
3	GPB6	GPI	gpiochip5 14	Digital input 6 (DIO circuit)
4	GPB7	GPI	gpiochip5 15	Digital input 7 (DIO circuit)
5	VDD	+3V3	X	Power supply
6	VSS	GND	X	Ground
7	NC	NC	X	Not connected
8	SCK	GPIO	X	I2C clock
9	SDA	GPIO	X	I2C data
10	NC	NC	X	Not connected

Pin	Port	Type	User-space name	Description
11	A0	+3V3	X	Address bit 0
12	A1	+3V3	X	Address bit 1
13	A2	GND	X	Address bit 2
14	RESET/	EXP1_NRST	X	Reset
15	INTB	GPIO_EXP_INT	X	Interrupt B
16	INTA	GPIO_EXP_INT	X	Interrupt A
17	GPA0	GPO	gpiochip5 0	Termination RS485_4 ON / OFF
18	GPA1	GPO	gpiochip5 1	Termination RS485_3 ON / OFF
19	GPA2	GPO	gpiochip5 2	Termination RS485_2 ON / OFF
20	GPA3	GPO	gpiochip5 3	Termination RS485_1 ON / OFF
21	GPA4	NC	X	Not connected
22	GPA5	NC	X	Not connected
23	GPA6	GPO	gpiochip5 6	Secure chip idle/busy
24	GPA7	GPI	gpiochip5 7	Digital input 1 (DIO circuit)
25	GPB0	GPO	gpiochip5 8	Digital input 2 (DIO circuit)
26	GPB1	GPI	gpiochip5 9	SD detect
27	GPB2	GPI	gpiochip5 10	VIN level error

Pin	Port	Type	User-space name	Description
28	GPB3	GPI	gpiochip5 11	Digital input 3 (DIO circuit)

I2C3

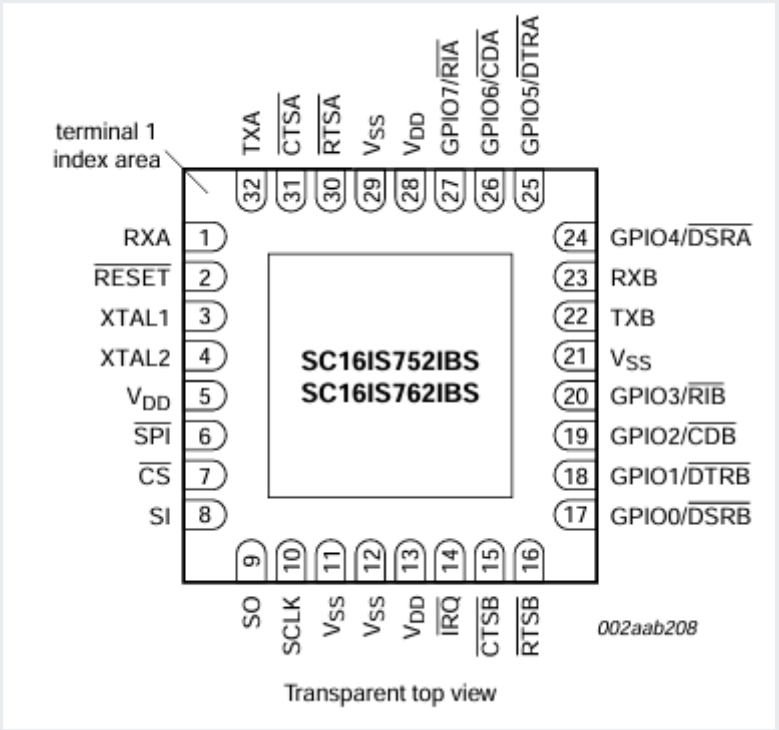
Device name: **/dev/i2c-2**

Signal	Processor pin	Default function
Clock	E10	I2C3_SCL
Data	F10	I2C3_SDA

Expander F

Part number: **SC16IS752IBS**

Expander F diagram



Expander F pins description

Pin	Type	Usage	User-space name	Description

1	RXA(I)	RS485_UART4_RX	X	RS485 UART4 RX
2	RESET/	RS485_NRST	X	Reset
3	XTAL1(I)	TXCO_OUT	X	Oscillator output
4	XTAL2(O)	NC	X	Not connected
5	VDD	+3V3	X	Power supply
6	I2C / SPI/	GND	X	Ground
7	CS/ / A0	SPI2_CS2	X	SPI chip select
8	SI / A1	SPI2_MOSI	X	SPI master out slave in
9	SO	SPI2_MISO	X	SPI master in slave out
10	SCL / SCLK	SPI2_SCLK	X	SPI clock
11	SDA / VSS	GND	X	Ground
12	VSS	GND	X	Ground
14	IRQ/	RS485_INT	X	RS485 interrupt
15	CTSB/	NC	X	Not connected
16	RTSB/	RS485_UART3_RTS	X	RS485 UART3 RTS
17	GPIO0 / DSRB/	NC	X	Not connected
18	GPIO1 / DTRB/	NC	X	Not connected
19	GPIO2 / CDB/	NC	X	Not connected
20	GPIO3 / RIB/	NC	X	Not connected
22	TXB(O)	RS485_UART3_TX	X	RS485 UART3 TX

23	RXB(I)	RS485_UART3_RX	X	RS485 UART3 RX
24	GPIO4 / DSRA/	NC	X	Not connected
25	GPIO5 / DTRA/	NC	X	Not connected
26	GPIO6 / CDA/	NC	X	Not connected
27	GPIO7 / RIA/	NC	X	Not connected
30	RTSA/	RS485_UART4_RTS	X	RS485 UART4 RTS
31	CTSA/	NC	X	Not connected
32	TXA(O)	RS485_UART4_TX	X	RS485 UART4 TX

SPI2

Signal	Processor pin	Default function
Chip select 0	A6	SPI2_CS0
Chip select 1	AF12	SPI2_CS1
Chip select 2	AB19	SPI2_CS2
Master in slave out	A8	SPI2_MISO
Clock	E6	SPI2_SCLK
Master out slave in	B8	SPI2_MOSI

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