TWR-SER2

User's Manual

Rev. 1.2

Contents

1 Overview

The Serial2 Tower Board (TWR-SER2) is a peripheral Tower System Module designed to be used with a compatible MCU/MPU Tower Card. The TWR-SER2 provides additional interfaces that are common to feature rich MPU's.

The TWR-SER2 features the following:

- Industrial-grade Dual Ethernet PHY Transceiver w/ dual RJ-45 Ethernet Jacks, with integrated magnetics and LED's
- Industrial-grade High Speed Dual Role USB PHY (utilizes MPU's ULPI interface)
- Full Speed / Low Speed Host only USB (utilizes USB Host controller interface)
- Four Serial Ports
    - Serial-to-USB (MC9S08JS16) w/ USB mini-B connector
    - RS-232 / RS-485 Transceivers on shared DB9 connector
    - 2x RS-232 Transceivers with option for full flow control on 2x5 Headers

A block diagram for the TWR-SER2 is shown in the figure below.

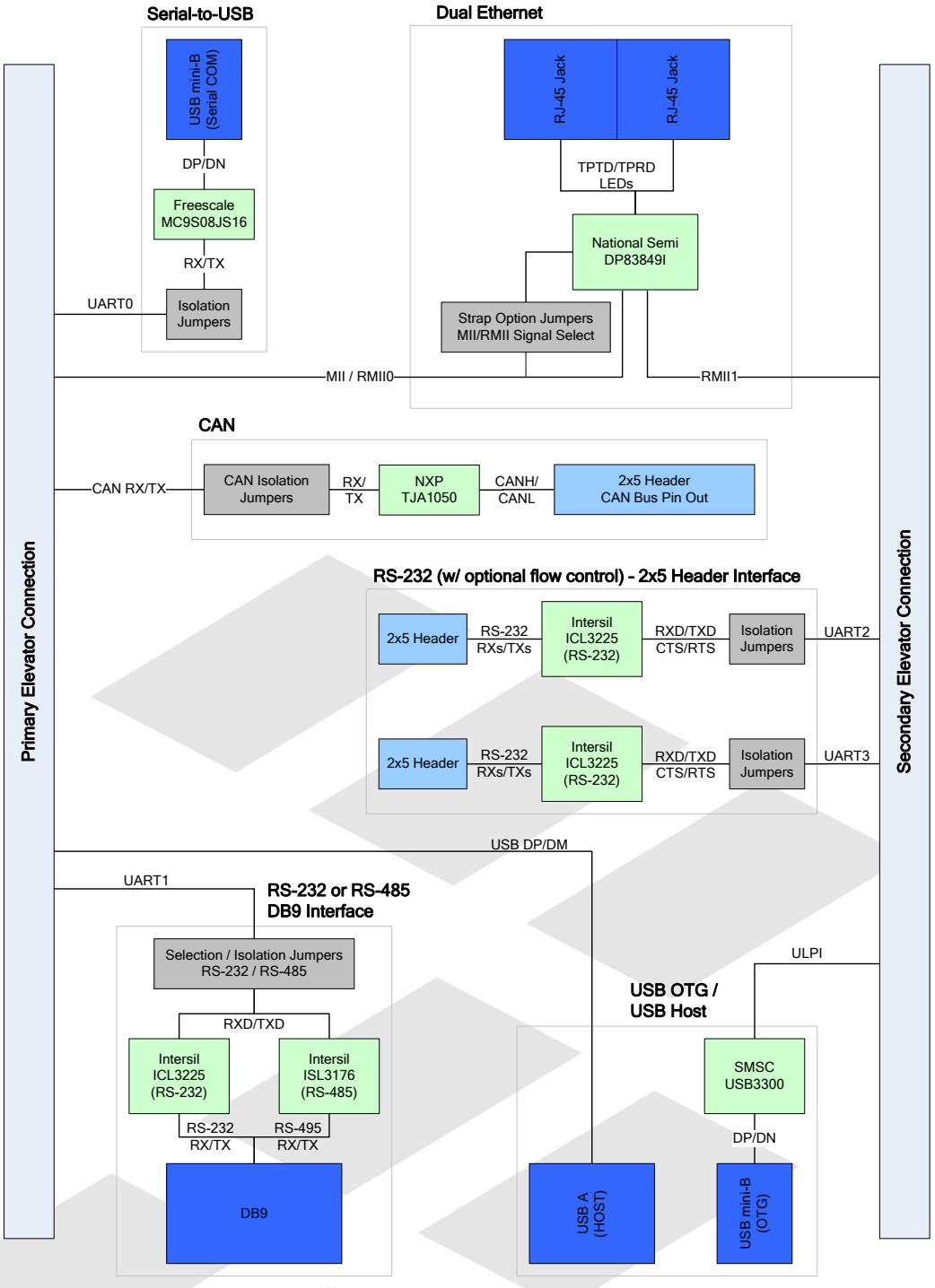


Figure 1 - TWR-SER2 Block Diagram

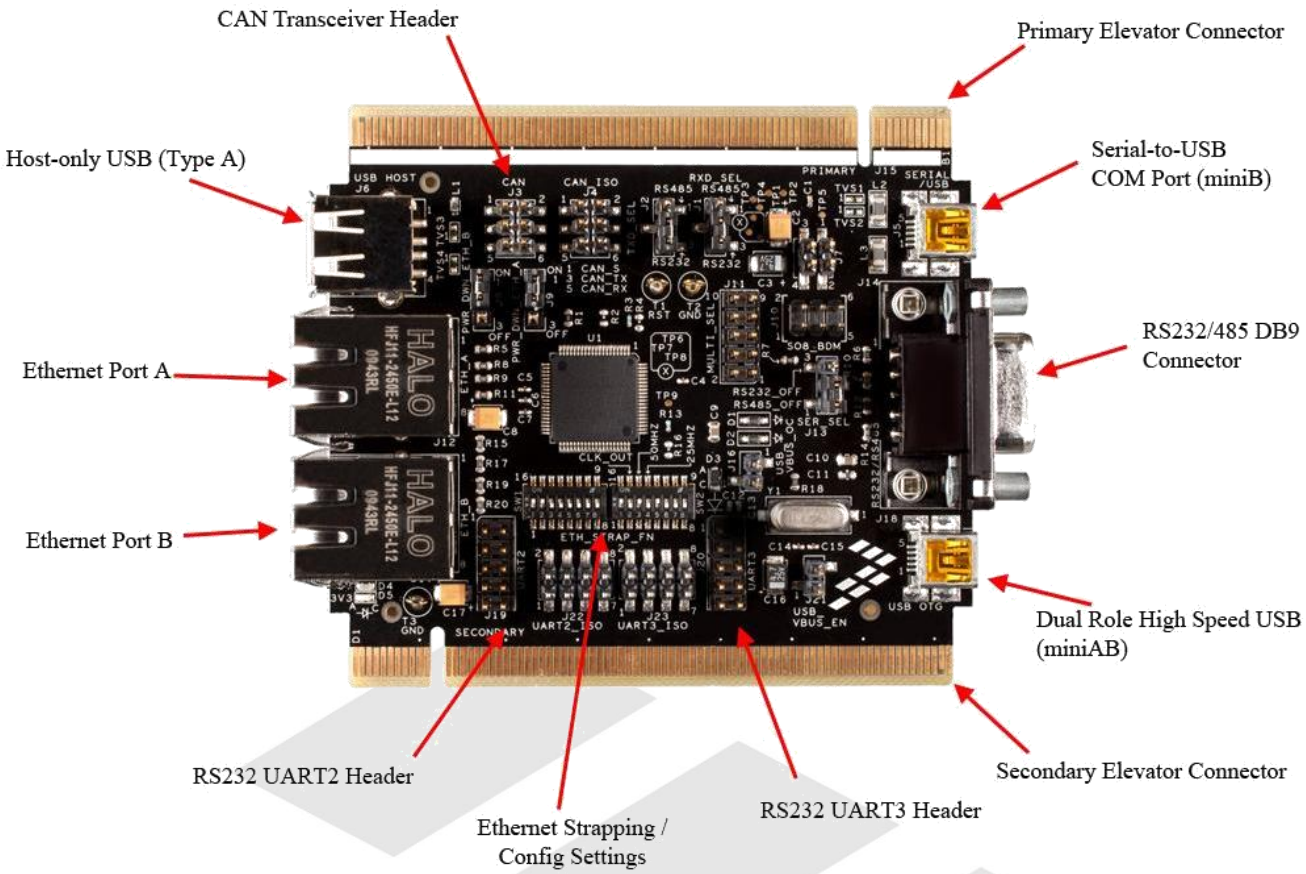


Figure 2 - TWR-SER2 Image

2 Reference Documents

The documents listed below should be referenced for more information on the Freescale Tower system and the TWR-SER2. Refer to http://www.freescale.com/tower for the latest revision of all released Tower documentation.

- *TWR-SER2 Schematics*
- *TWR-SER2 Quick Start Guide*
- *Freescale MC9S08JS16 Microcontroller with integrated USB Transceiver*
- *DP83849I PHYTER DUAL Industrial Temp Ethernet PHY Transceiver*
- *USB3300 Industrial Temp Hi-Speed USB PHY with ULPI Interface*
- *TJA1051T/3 High-Speed CAN Transceiver*

3 Hardware Features

This section provides more details about the features and functionality of the TWR-SER2.

3.1 Power Supply

It is intended that the TWR-SER2 be powered from a source in an assembled Tower System via the 5.0V and 3.3V supplies on the TWR-ELEV. This includes the functional Tower Elevator USB power connector, a capable MCU/MPU controller module, or other Tower System module capable of providing power to the entire Tower System. The TWR-SER2 is can also provide power to the Tower System when configured and used as a USB device through the Hi-Speed USB connection (Jumper J24).

3.2 Dual Ethernet PHYs

The TWR-SER2 module utilizes an industrial applicable National Semiconductor Dual Ethernet PHY Transceiver (DP83849I). The DP83849I features two fully independent 10/100 ports for multi-port applications. The TWR-SER2 is capable of supporting a single MII interface, a single RMII interface, or dual RMII interfaces.
The Ethernet PHY is configurable via two sets of micro dip switches (SW1 and SW2).

Refer to these settings for typical Ethernet setting. For specific setting details refer to the TWR-SER2 Jumper Options section.

- **10/100 Dual RMII**
  - J8 and J9 should be un-shunted
  - Configure SW1 (1-8) as 11000000
  - Configure SW2 (1-8) as 10100000
- **10/100 Signal Port RMII**
  - J9 should be un-shunted
  - Configure SW1 (1-8) as 11000000
  - Configure SW2 (1-8) as 10100000
- **10/100 Signal Port MII**
  - J9 should be un-shunted
  - Configure SW1 (1-8) as 00110000
  - Configure SW2 (1-8) as 00010000

3.3 Hi-Speed Dual Role USB

The TWR-SER2 features Hi-Speed Dual Role USB. This feature is implemented using the SMSC USB3300 USB Transceiver with ULPI interface. The ULPI interface is connected to the TWR-SER2 PCI edge connector connect to a Tower MCU module.

Refer to these settings to configure the High Speed USB ULPI Transceiver.

- **Host Mode** – TWR-SER2 will be connected to a device, such as a USB Memory Stick using the appropriate mini USB adaptor.
  - J24 should be un-shunted

- **Device Mode** – TWR-SER2 will be connected to a host, such as a host PC.
    - J24 should be shunted, if it is desired that the entire Tower system be powered via this connection.

3.4 Low/Full-Speed Host USB

The TWR-SER2 features a Host Type-A USB receptacle. The USB differential signals are connected directly to the Tower Elevator USB Signals and will be connected to a compatible Tower System MCU/MPU module's USB Host controller. In addition to the differential data pair, the MCU should provide the VBUS_EN signal and respond to the VBUS_OC signals. J16 and J21 should be shunted to connect VBUS enable/over-current control to the MCU signals.

3.5 Serial Communications Interface

The TWR-SER2 is capable of providing up to four additional SCI's. The number of accessible SCI's on the TWR-SER2 will depend on the capabilities and Tower Elevator signals connections of the MCU/MPU Module.

3.5.1 RS-232/485 Interface

UART1 (RXD/TXD) is connected to both an RS-232 transceiver and an RS-485 transceiver, selectable by a series of selection jumpers (J1, J2, & J13). The RS-232 and RS-485 transceivers are terminated at a common DB9 connector (J11). This SCI does not feature any type of flow control capabilities. Additional configurations related to the RS485 interface can be made using the MULTI_SEL jumper (J2). Refer to the following tables for jumper setting details.

Jumper	Pin	Description
J1	2-3	RXD_SEL – Specifies the SCI RX signal is routed to the RS232 Transceiver
J2	2-3	TXD_SEL – Specifies the SCI TX signal is routed to the RS232 Transceiver
J13	1-2	SER_SEL – Disables communication to and from the RS485 Transceiver

Jumper	Pin	Description
J1	1-2	RXD_SEL – Specifies the SCI RX signal is routed to the RS485 Transceiver
J2	1-2	TXD_SEL – Specifies the SCI TX signal is routed to the RS485 Transceiver
J13	2-3	SER_SEL – Disables communication to and from the RS232 Transceiver

	Pin	Description
MULTI_SEL (J2)	1-2	Connects RS485 Receive EN and Driver EN
	3-4	Connects RS485 RX+ to TX+; Loopback
	5-6	Connects RS485 RX- to TX-; Loopback
	7-8	*NC*
	9-10	Connects 5V supply to DB9 pin 6

3.5.2 Serial-to-USB

UART0 (RXD/TXD) is connected to a Freescale MC9S08JS16. The MC9S08JS16 provides a Serial-to-USB conversion that will transmit/receive external data via its USB transceiver connected to an USB mini-B connector. When this USB receptacle is connected to a host PC it will enumerate as a USB CDC. The driver required for the CDC device is located on the included CD and is also available on the TWR-SER2 webpage found at www.freescale.com/tower.

If needed the UART0 transceiver signals can be isolated from the Tower Elevator using J7.

Pins	Description
1-2	Remove to Isolate UART0_TX
3-4	Remove to Isolate UART0_RX

3.5.3 Additonal RS232 Interfaces

UART2 and UART3 (RXD/TXD/RTS/CTS) are connected to additional RS-232 transceivers. The RS-232 transceivers are terminated to 2x5 headers (refer to table for pinout).
These interfaces are capable of utilizing the optional RTS/CTS signals for flow control.

J19 & J20	
Pin #	**Signal Name**
1	*NC*
2	*NC*
3	**RXD**
4	**RTS**
5	**TXD**
6	**CTS**
7	*NC*
8	*NC*
9	**GND**
10	*NC*

The 2x5 header is intended to be used with a DB-9 Male to 10 PIN IDC socket adaptor cable. The cable should conform to the following pin assignments.

10 Pin IDC 0.1" 2x5	DB-9 Male	Function
1	1	DCD
2	6	DSR
3	2	RX
4	7	RTS
5	3	TX
6	8	CTS
7	4	DTR
8	9	RI
9	5	GND
10	*NC*	*NC*

By default the UART2 and UART3 transceiver signals are isolated from the Tower Elevator. The signals can be connected to the Tower Elevator connector using J22 and J23 respectively.

Pins	Description
1-2	Remove to Isolate UARTx_TX
3-4	Remove to Isolate UARTx_RX
5-6	Remove to Isolate UARTx_RTS
7-8	Remove to Isolate UARTx_CTS

3.6 CAN Bus

The TWR-SER2 features a Controller Area Network interface using an NXP TJA1051T/3 CAN transceiver. The signals from the transceiver are connected to a 6-pin (2x3) header using the following CAN Bus Pin Out.

Pin #	Signal Names	Signal Description
1	Not Used	
2	CAN_V+	Power
3	CAN_GND	Ground
4	CAN_L	Dominant Low
5	CAN_H	Dominant High
6	Not Used	

Table 1 – 2x3 Header CAN Bus Pin Out

If needed the CAN transceiver signals can be isolated from the Tower Elevator using J4.

Pins	Description
1-2	Remove to Isolate CAN_S
3-4	Remove to Isolate CAN_TX
5-6	Remove to Isolate CAN_RX

3.7 Elevator Connections

The TWR-SER2 features two expansion card-edge connectors that interface to Elevator boards in a Tower System: the Primary and Secondary Elevator connectors. Table 2 provides the pinout for the Primary and Secondary Elevator Connector. An "X" in the "Used" column indicated that there is a connection from the TWR-MEM to that pin on the Elevator connector. An "X" in the "Jmp" column indicates that a jumper is available that can configure or isolate the connection from the Elevator connector.

Table 2 - TWR-SER2 Primary Elevator Connector Pinout

TWR-SER2 Primary Connector									
Pin	Name	Usage	Used	Jmp	Pin	Name	Usage	Used	Jmp
B1	**5V**	**5.0V Power**	**X**		A1	**5V**	**5.0V Power**	**X**	
B2	**GND**	**Ground**	**X**		A2	**GND**	**Ground**	**X**	
B3	**3.3V**	**3.3V Power**	**X**		A3	**3.3V**	**3.3V Power**	**X**	
B4	ELE_PS_SENSE	Elevator Power Sense	**X**		A4	**3.3V**	**3.3V Power**	**X**	
B5	**GND**	**Ground**	**X**		A5	**GND**	**Ground**	**X**	
B6	**GND**	**Ground**	**X**		A6	**GND**	**Ground**	**X**	
B7	SDHC_CLK / SPI1_CLK				A7	I2C0_SCL			
B8	SDHC_D3 / SPI1_CS1_b				A8	I2C0_SDA			
B9	SDHC_D3 / SPI1_CS0_b				A9	GPIO9 / UART1_CTS			
B10	SDHC_CMD / SPI1_MOSI				A10	GPIO8 / SDHC_D2			
B11	SDHC_D0 / SPI1_MISO				A11	GPIO7 / SD_WP_DET			
B12	ETH_COL	MII_COL	**X**		A12	ETH_CRS	MII_CRS	**X**	
B13	ETH_RXER	MII_RXER / RMII0_RXER	**X**		A13	ETH_MDC	MII_MDC / RMII0_MDC	**X**	
B14	ETH_TXCLK	MII_TXCLK	**X**		A14	ETH_MDIO	MII_MDIO / RMII0_MDIO	**X**	
B15	ETH_TXEN	MII_TXEN / RMII0_TXEN	**X**		A15	ETH_RXCLK	MII_RXCLK	**X**	
B16	ETH_TXER				A16	ETH_RXDV	MII_RXDV / RMII0_CRS_DV	**X**	
B17	ETH_TXD3	MII_TXD3	**X**		A17	ETH_RXD3	MII_RXD3	**X**	
B18	ETH_TXD2	MII_TXD2	**X**		A18	ETH_RXD2	MII_RXD2	**X**	
B19	ETH_TXD1	MII_TXD1 / RMII0_TXD1	**X**		A19	ETH_RXD1	MII_RXD1 / RMII0_RXD1	**X**	
B20	ETH_TXD0	MII_TXD0 / RMII0_TXD0	**X**		A20	ETH_RXD0	MII_RXD0 / RMII0_RXD0	**X**	
B21	GPIO1 /UART1_RTS		**X**		A21	I2S0_MCLK			

TWR-SER2 Primary Connector									
Pin	Name	Usage	Used	Jmp	Pin	Name	Usage	Used	Jmp
B22	GPIO2 / SDHC_D1		X		A22	I2S0_DOUT_SCK			
B23	GPIO3				A23	I2S0_DOUT_WS			
B24	CLKIN0	RMII_REF_CLK	X	X	A24	I2S0_DIN0			
B25	CLKOUT1				A25	I2S0_DOUT0			
B26	**GND**	**Ground**	X		A26	**GND**	**Ground**	X	
B27	AN7				A27	AN3			
B28	AN6				A28	AN2			
B29	AN5				A29	AN1			
B30	AN4				A30	AN0			
B31	**GND**	**Ground**	X		A31	**GND**	**Ground**	X	
B32	DAC1				A32	DAC0			
B33	TMR3				A33	TMR1			
B34	TMR2				A34	TMR0			
B35	GPIO4	USB_VBUS_EN	X	X	A35	GPIO6	USB_VBUS_OC	X	X
B36	**3.3V**	**3.3V Power**	X		A36	**3.3V**	**3.3V Power**	X	
B37	PWM7				A37	PWM3		X	
B38	PWM6				A38	PWM2		X	
B39	PWM5		X		A39	PWM1		X	
B40	PWM4		X		A40	PWM0		X	
B41	CAN0_RX	CAN_RX	X	X	A41	UART0_RX	UART0_RX	X	X
B42	CAN0_TX	CAN_TX	X	X	A42	UART0_TX	UART0_TX	X	X
B43	1WIRE	CAN_S	X	X	A43	UART1_RX	UART1_RX	X	X
B44	SPI0_MISO (IO1)		X		A44	UART1_TX	UART1_TX	X	X
B45	SPI0_MOSI (IO0)		X		A45	VSSA			
B46	SPI0_CS0_b		X		A46	VDDA			
B47	SPI0_CS1_b		X		A47	CAN1_RX			
B48	SPI0_CLK		X		A48	CAN1_TX			
B49	**GND**	**Ground**	X		A49	**GND**	**Ground**	X	
B50	I2C1_SCL				A50	GPIO14			
B51	I2C1_SDA				A51	GPIO15			
B52	GPIO5 / SPI0_HOLD (IO3)		X		A52	GPIO16 / SPI0_WP (IO2)			
B53		USB D+ Pulldown Control	X		A53	GPIO17			
B54		USB D- Pulldown Control	X		A54	USB0_DM	USB D-	X	
B55	IRQ_H				A55	USB0_DP	USB D+	X	
B56	IRQ_G				A56	USB0_ID			
B57	IRQ_F				A57	USB0_VBUS	USB VBUS HST	X	
B58	IRQ_E				A58	I2S0_DIN_SCK			
B59	IRQ_D				A59	I2S0_DIN_WS			
B60	IRQ_C				A60	I2S0_DIN1			
B61	IRQ_B				A61	I2S0_DOUT1			
B62	IRQ_A				A62	RSTIN_b			
B63	EBI_ALE / EBI_CS1_b				A63	RSTOUT_b	Reset to Ethernet PHY / SPI	X	
B64	EBI_CS0_b				A64	CLKOUT0	CLOCKOUT0	X	
B65	**GND**	**Ground**	X		A65	**GND**	**Ground**	X	

TWR-SER2 Primary Connector									
Pin	Name	Usage	Used	Jmp	Pin	Name	Usage	Used	Jmp
B66	EBI_AD15				A66	EBI_AD14			
B67	EBI_AD16				A67	EBI_AD13			
B68	EBI_AD17				A68	EBI_AD12			
B69	EBI_AD18				A69	EBI_AD11			
B70	EBI_AD19				A70	EBI_AD10			
B71	EBI_R/W_b				A71	EBI_AD9			
B72	EBI_OE_b				A72	EBI_AD8			
B73	EBI_D7				A73	EBI_AD7			
B74	EBI_D6				A74	EBI_AD6			
B75	EBI_D5				A75	EBI_AD5			
B76	EBI_D4				A76	EBI_AD4			
B77	EBI_D3				A77	EBI_AD3			
B78	EBI_D2				A78	EBI_AD2			
B79	EBI_D1				A79	EBI_AD1			
B80	EBI_D0				A80	EBI_AD0			
B81	**GND**	**Ground**	**X**		A81	**GND**	**Ground**	**X**	
B82	**3.3V**	**3.3V Power**	**X**		A82	**3.3V**	**3.3V Power**	**X**	

Table 3 - TWR-SER2 Secondary Elevator Connector Pinout

TWR-SER2 Secondary Connector									
Pin	Name	Usage	Used	Jmp	Pin	Name	Usage	Used	Jmp
D1	**5V**	**5.0V Power**	**X**		C1	**5V**	**5.0V Power**	**X**	
D2	**GND**	**Ground**	**X**		C2	**GND**	**Ground**	**X**	
D3	**3.3V**	**3.3V Power**	**X**		C3	**3.3V**	**3.3V Power**	**X**	
D4	ELE_PS_SENSE	Elevator Power Sense			C4	**3.3V**	**3.3V Power**	**X**	
D5	**GND**	**Ground**	**X**		C5	**GND**	**Ground**	**X**	
D6	**GND**	**Ground**	**X**		C6	**GND**	**Ground**	**X**	
D7	SPI2_CLK				C7	I2C2_SCL			
D8	SPI2_CS1_b				C8	I2C2_SDA			
D9	SPI2_CS0_b				C9	GPIO25			
D10	SPI2_MOSI				C10	ULPI_STOP	ULPI_STP	**X**	
D11	SPI2_MISO				C11	ULPI_CLK	ULPI_USB_CLK	**X**	
D12	ETH_COL				C12	GPIO26			
D13	ETH_RXER	RMII1_RXER	**X**		C13	ETH_MDC			
D14	ETH_TXCLK				C14	ETH_MDIO			
D15	ETH_TXEN	RMII1_TXEN	**X**		C15	ETH_RXCLK			
D16	GPIO18				C16	ETH_RXDV	RMII1_CRS_DV	**X**	
D17	GPIO19 / SDHC_D4				C17	GPIO27 / SDHC_D6			
D18	GPIO20 / SDHC_D5				C18	GPIO28 / SDHC_D7			
D19	ETH_TXD1	RMII1_TXD1	**X**		C19	ETH_RXD1	RMII1_RXD1	**X**	
D20	ETH_TXD0	RMII1_TXD0	**X**		C20	ETH_RXD0	RMII1_RXD0	**X**	
D21	ULPI_NEXT / USB_HS_DM	ULPI_NXT	**X**		C21	ULPI_DATA0 / I2S1_MCLK	ULPI_DATA0	**X**	
D22	ULPI_DIR / USB_HS_DP	ULPI_DIR	**X**		C22	ULPI_DATA 1 / I2S1_DOUT_SCK	ULPI_DATA1	**X**	
D23	UPLI_DATA5 / USB_HS_VBUS	ULPI_DATA5	**X**		C23	ULPI_DATA2 / I2S1_DOUT_WS	ULPI_DATA2	**X**	
D24	ULPI_DATA6 / USB_HS_ID	ULPI_DATA6	**X**		C24	ULPI_DATA3 / I2S1_DIN0	ULPI_DATA3	**X**	
D25	ULPI_DATA7	ULPI_DATA7	**X**		C25	ULPI_DATA4 / I2S1_DOUT0	ULPI_DATA4	**X**	
D26	**GND**	**Ground**	**X**		C26	**GND**	**Ground**	**X**	
D27	LCD_HSYNC / LCD_P24				C27	AN11			
D28	LCD_VSYNC / LCD_P25				C28	AN10			
D29	AN13				C29	AN9			
D30	AN12				C30	AN8			
D31	**GND**	**Ground**	**X**		C31	**GND**	**Ground**	**X**	
D32	LCD_CLK / LCD_P26				C32	GPIO29 / UART2_DCD			
D33	TMR11				C33	TMR9			
D34	TMR10				C34	TMR8			
D35	GPIO21				C35	GPIO30 / UART3_DCD			
D36	**3.3V**	**3.3V Power**			C36	**3.3V**	**3.3V Power**	**X**	
D37	PWM15				C37	PWM11			
D38	PWM14				C38	PWM10			
D39	PWM13				C39	PWM9			
D40	PWM12				C40	PWM8			
D41	CAN2_RX				C41	UART2_RXD / TSI0	UART2_RX	**X**	**X**
D42	CAN2_TX				C42	UART2_TXD / TSI1	UART2_TX	**X**	**X**

TWR-SER2 Secondary Connector									
Pin	Name	Usage	Used	Jmp	Pin	Name	Usage	Used	Jmp
D43	LCD_CONTRAST				C43	UART2_RTS / TSI2	UART2_RTS	X	X
D44	LCD_OE / LCD_P27				C44	UART2_CTS / TSI3	UART2_CTS	X	X
D45	LCD_D0 / LCD_P0				C45	UART3_RXD / TSI4	UART3_RX	X	X
D46	LCD_D1 / LCD_P1				C46	UART3_TXD / TSI5	UART3_TX	X	X
D47	LCD_D2 / LCD_P2				C47	UART3_RTS / CAN3_RX	UART3_RTS	X	X
D48	LCD_D3 / LCD_P3				C48	UART3_CTS / CAN3_TX	UART3_CTS	X	X
D49	**GND**	**Ground**	X		C49	**GND**	**Ground**	X	
D50	GPIO23				C50	LCD_D4 / LCD_P4			
D51	GPIO24				C51	LCD_D5 / LCD_P5			
D52	LCD_D12 / LCD_P12				C52	LCD_D6 / LCD_P6			
D53	LCD_D13 / LCD_P13				C53	LCD_D7 / LCD_P7			
D54	LCD_D14 / LCD_P14				C54	LCD_D8 / LCD_P8			
D55	IRQ_P / SPI2_CS2_b				C55	LCD_D9 / LCD_P9			
D56	IRQ_O / SPI2_CS3_b				C56	LCD_D10 / LCD_P10			
D57	IRQ_N				C57	LCD_D11 / LCD_P11			
D58	IRQ_M				C58	I2S1_DIN_SCK			
D59	IRQ_L				C59	I2S1_DIN_WS			
D60	IRQ_K				C60	I2S1_DIN1			
D61	IRQ_J				C61	I2S1_DOUT1			
D62	IRQ_I				C62	LCD_D15 / LCD_P15			
D63	LCD_D18 / LCD_P18 / SD_RX_0				C63	LCD_D16 / LCD_P16 / SD_GND			
D64	LCD_D19 / LCD_P19 / SD_RXb_0				C64	LCD_D17 / LCD_P17 / SD_GND			
D65	**GND**	**Ground**	X		C65	**GND**	**Ground**	X	
D66	EBI_AD20 / LCD_P42 / SD_GND				C66	EBI_BE_32_24_b / LCD_P28 / SD_TX_0			
D67	EBI_AD21 / LCD_P43 / SD_GND				C67	EBI_BE_23_16_b / LCD_P29 / SD_TXb_0			
D68	EBI_AD22 / LCD_P44 / SD_RX_1				C68	EBI_BE_15_8_b / LCD_P30 / SD_GND			
D69	EBI_AD23 / LCD_P45 / SD_RXb_1				C69	EBI_BE_7_0_b / LCD_P31 / SD_GND			
D70	EBI_AD24 / LCD_P46 / SD_GND				C70	EBI_TSIZE0 / LCD_P32 / SD_TX_1			
D71	EBI_AD25 / LCD_P47 / SD_GND				C71	EBI_TSIZE1 / LCD_P33 / SD_TXb_1			
D72	EBI_AD26 / LCD_P48 / SD_RX_2				C72	EBI_TS_b / LCD_P34 / SD_GND			
D73	EBI_AD27 / LCD_P49 / SD_RXb_2				C73	EBI_TBST_b / LCD_P35 / SD_GND			
D74	EBI_AD28 / LCD_P50 / SD_GND				C74	EBI_TA_b / LCD_P36 / SD_TX_2			
D75	EBI_AD29 / LCD_P51 / SD_GND				C75	EBI_CS4_b / LCD_P37 / SD_TXb_2			
D76	EBI_AD30 / LCD_P52 / SD_RX_3				C76	EBI_CS3_b / LCD_P38 / SD_GND			
D77	EBI_AD31 / LCD_P53 / SD_RXb_3				C77	EBI_CS2_b / LCD_P39 / SD_GND			
D78	LCD_D20 / LCD_P20 / SD_GND				C78	EBI_CS1_b / LCD_P40 / SD_TX_3			
D79	LCD_D21 / LCD_P21 / SD_REFCLK				C79	GPIO31 / LCD_P41 / SD_TXb_3			
D80	LCD_D22 / LCD_P22 / SD_REFCLKb				C80	LCD_D23 / LCD_P23 / SD_GND			
D81	**GND**	**Ground**	X		C81	**GND**	**Ground**	X	
D82	**3.3V**	**3.3V Power**	X		C82	**3.3V**	**3.3V Power**	X	

4 Configuration Settings

There are several jumpers provided for isolation, configuration, and feature selection. Refer to the following table for details. The default installed jumper settings are shown in *__bold__*.

4.1 Switch Settings

Switch Options		Setting		Description
SW1	Ethernet Strapping Functions / Settings	Dip 1	***On***	Enables RMII mode for Ethernet PHY A
			Off	Enables MII mode for Ethernet PHY A
		Dip 2	***On***	Connects RX_CRS to RMII0_CRS_DV (required for RMII operation)
			Off	Disconnects RX_CRS from RMII0_CRS_DV (required for MII operation)
		Dip 3	On	Connects RX_CRS to MII_CRS (required for MII operation)
			Off	Disconnects RX_CRS from MII_CRS (required for RMII operation)
		Dip 4	On	Connects RX_DV to MII_RXDV (required for MII operation)
			Off	Disconnects RX_DV from MII_RXDV (required for RMII operation)
		Dip 5	On	Enables Dual PHY Extender Mode
			Off	Disables Extender Mode
		Dip 6	On	PHY A - Auto Negotiation (Use AN0/AN1 to set highest capability)
			Off	PHY A - Forced Mode (Use AN0/AN1 to set forced mode)
		Dip 7	On	AN0_A - Full-Duplex on PHY A
			Off	AN0_A - Half-Duplex on PHY A
		Dip 8	On	AN1_A - 100Base-TX on PHY A
			Off	AN1_A - 10Base-T on PHY A
SW2	Ethernet Strapping Functions / Settings	Dip 1	***On***	Enables RMII mode for Ethernet PHY B
			Off	Enables MII mode for Ethernet PHY B
		Dip 2	On	Connects CLOCKOUT0 to Ethernet PHY Clock
			Off	Isolates CLOCKOUT0 from Ethernet PHY Clock
		Dip 3	***On***	Connects onboard 50MHz clock to Ethernet PHY Clock
			Off	Isolates onboard 50MHz clock from Ethernet PHY Clock
		Dip 4	On	Connects onboard 25MHz clock to Ethernet PHY Clock
			Off	Isolates onboard 25MHz clock from Ethernet PHY Clock
		Dip 5	On	Disables onboard 25MHz / 50MHz clock
			Off	Enables onboard 25MHz / 50MHz clock
		Dip 6	On	PHY B - Auto Negotiation (Use AN0/AN1 to set highest capability)
			Off	PHY B - Forced Mode (Use AN0/AN1 to set forced mode)
		Dip 7	On	AN0_B - Full-Duplex on PHY B
			Off	AN0_B - Half-Duplex on PHY B
		Dip 8	On	AN1_B - 100Base-TX on PHY B
			Off	AN1_B - 10Base-T on PHY B

Figure 3 - TWR-SER2 Switch Settings

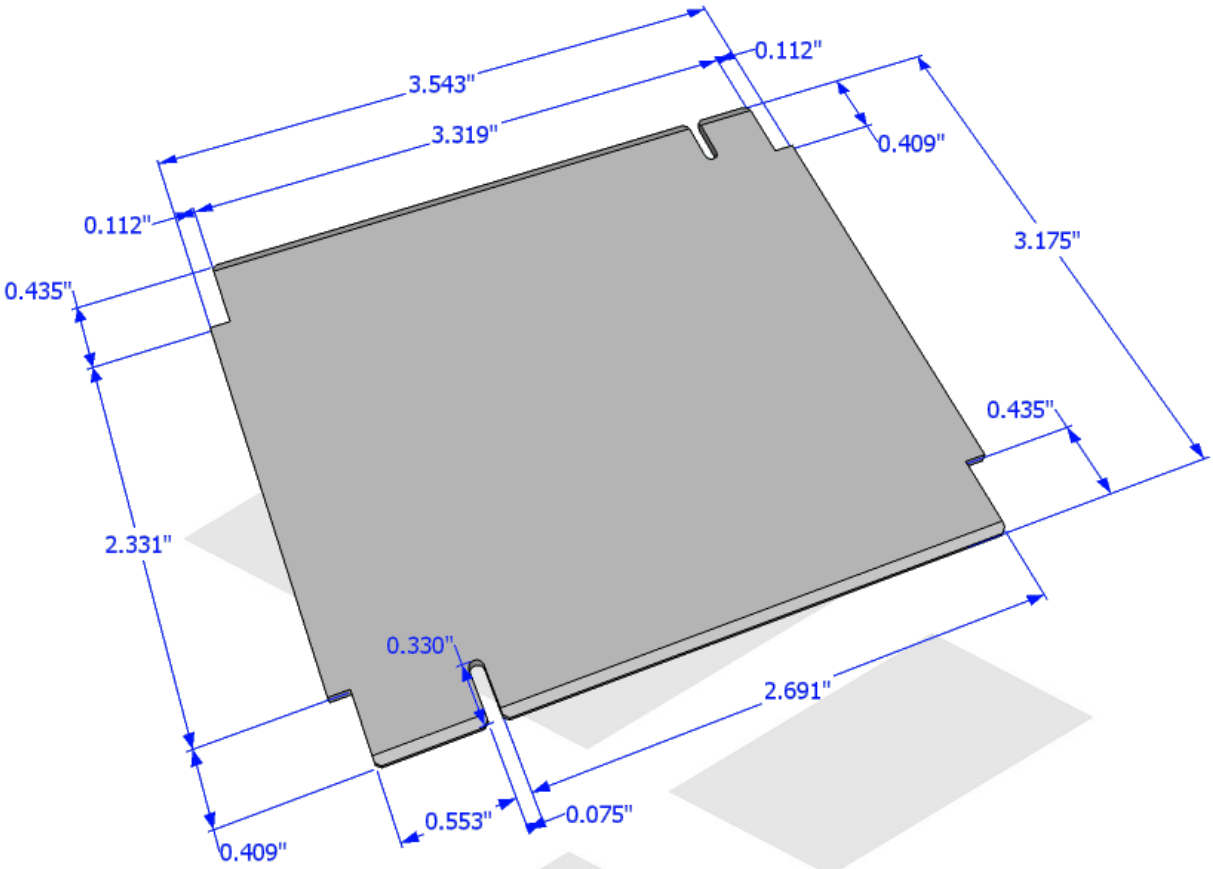
4.2 Jumper Settings

Jumper Options		Setting	Description
J1	RS232/485 RX Select (UART 1)	1-2	RS485 Mode (connects RX to RO)
		2-3	RS232 Mode (connects RX to R1OUT)
J2	RS232/485 TX Select (UART 1)	1-2	RS485 Mode (connects TX to DI)
		2-3	RS232 Mode (connects TX to T1IN)
J4	CAN Isolation	1-2	Connects CAN_S to S
		3-4	Connects CAN_TX to TXD
		5-6	Connects CAN_RX to RXD
J7	JS16 RS232 Isolation (UART 0)	***1-2***	Connects RX to S08JS16 RXD
		3-4	Connects TX to S08JS16 TXD
J8	Power Down Port B	1-2	Disables Ethernet PHY B
J9	Power Down Port A	1-2	Disables Ethernet PHY A
J11	RS485 Config (UART 1)	1-2	Loopback Mode (connects RE to DE)
		3-4	Loopback Mode (connects TX0_P to RX0_P)
		5-6	Loopback Mode (connects TX0_N to RX0_N)
		7-8	NC
		9-10	5V Supply to DB9
J13	RS232/485 Disable (UART 1)	***1-2***	Disables RS485
		2-3	Disables RS232
J16	VBUS OC Isolation	1-2	Connects USB VBUS OC to Elevator
J21	VBUS EN Isolation	1-2	Connects USB VBUS EN to Elevator
J22	RS232 (UART2) Isolation	1-2	Connects TX to T1IN
		3-4	Connects RX to R1OUT
		5-6	Connects RTS to T2IN
		7-8	Connect CTS to R2OUT
J23	RS232 (UART3) Isolation	1-2	Connects TX to T1IN
		3-4	Connects RX to R1OUT
		5-6	Connects RTS to T2IN
		7-8	Connects CTS to R2OUT
J24	USB Device Mode	1-2	Device Mode (capable of powering Tower System)

Figure 4 - TWR-SER2 Jumper Settings

5 Mechanical Form Factor

The TWR-SER2 is designed for the Freescale Tower System as a side mounting peripheral and complies with the electrical and mechanical specification as described in *Freescale Tower Electromechanical Specification*.



OCEAN CHIPS
Океан Электроники
Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «**JONHON**», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «**FORSTAR**».

AVIC JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

FORSTAR®

Телефон: 8 (812) 309-75-97 (многоканальный)
Факс: 8 (812) 320-03-32
Электронная почта: ocean@oceanchips.ru
Web: http://oceanchips.ru/
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А