Quick Start Guide

TWR-PXN20
32-bit Dual-Core Power Architecture®
MCU for Connected Performance

freescale™

TOWER SYSTEM

Get to Know the TWR-PXN20

Primary Connector

Potentiometer

User Buttons

User LEDs

NEXUS

JTAG

Reset Button

USB OSJTAG Virtual Serial Port

PXN2020

General-Purpose TWRPI Connector

Accelerometer

CAN

RS485

Universal Header

RS232

Secondary Connector
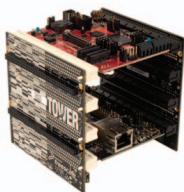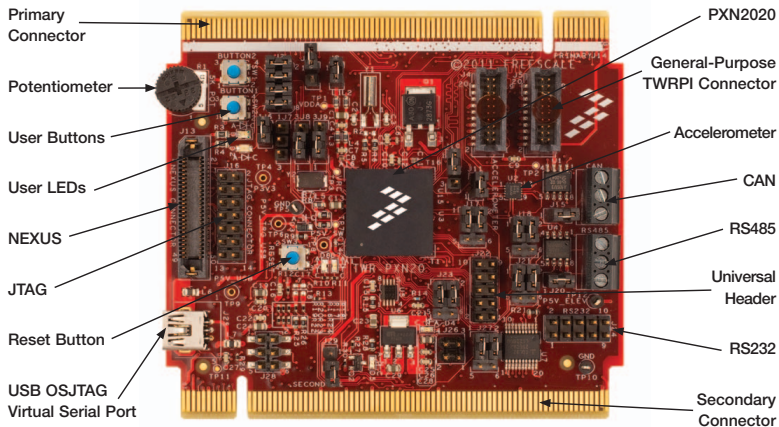
TWR-PXN20
Freescale Tower System

The TWR-PXN20 module is part of the Freescale Tower System portfolio, a modular development platform that enables rapid prototyping and tool re-use through reconfigurable hardware. Elevate your design to the next level with this industrial powerhouse by building your Tower System today.

TWR-PXN20 Features

- MPXN2020VMG116 MCU: Up to 116 MHz 32-bit dual-core MCU: e200z6 and e200z0, 2 MB on-chip flash, 592 KB on-chip SRAM, 32-channel DMA, 6x UART, 3x SPI, 6x CAN, 4x I²C, 36-channel 10-bit ADC, Fast Ethernet controller (FEC), debug JTAG interface and Nexus 3, timed I/Os: eMIOS 24-channel, 16-bit, internal timers: programmable interrupt timers 8-channel, 32-bit, -40°C/+105°C temp. range, package options 208 MAPBGA, low-power modes)
- CAN transceiver
- RS485 half duplex transceiver
- RS232 transceiver
- Four LEDs for user interface
- Two mechanical push buttons for user interface
- Potentiometer for ADC testing
- 3-axis accelerometer (MMA8451Q)
- General-purpose TWRPI socket (Tower plug-in module)
- OSJTAG open source JTAG debug interface (MC9S08JM60)
- OSJTAG virtual serial port using USB
- NEXUS, JTAG debug interface
- Universal header (GPIO)

Step-by-Step Installation Instructions

In this quick start guide, you will learn how to set up the TWR-PXN20 module and run the included demonstration software. For more detailed information, please see the user manual found on the included DVD or at **freescale.com/TWR-PXN20**.

1 Connecting the TWR-SER

Insert the TWR-PXN20 and TWR-SER modules into the primary and secondary elevator module (as shown). The "primary" and "secondary" cards edges for each module are indicated along the card edges.

2 Powering Up the TWR-PXN20

Connect the TWR-PXN20 module to a computer or a wall charger using the provided USB cable. Additionally, the USB connector on the primary elevator or OSJTAG connector can be used to power up the module.

3 Using the Serial to USB Bridge

The MC9S08JM60 serial to USB bridge solution provides an RS-232 equivalent connection to the host computer through the USB communications device class. When plugged in and powered, the USB connection will enumerate as a COM port on the PC. This means any terminal utility program may be used to receive serial data from the USB port. To determine the COM port number for the connection, right click on the My Computer icon and select "Manage," click Device Manager, find and expand ports (COM and LPT).

4 Installing the Software Driver

When the cable is plugged in for the first time, the Found New Hardware Wizard will start. Select the option Install from a list or specific location (Advanced), then

select "Next." Select the CDC Virtual Serial Port Folder which is available on the DVD or at **freescale.com/TWR-PXN20**. The Wizard will find the updated driver within the folder and install it.

5 Configuring a Communication Terminal

Open Terminal Utility (Virtual Serial Toolkit which is available on the DVD or at **freescale.com/TWR-PXN20**) or a terminal program of your choice. Open the COM port from step 4 with the following settings:

- Bits per Second: 115200
- Data Bits: 8
- Parity: None
- Stop Bit: 1
- Flow Control: None

6 Running Demonstration Code

Press the RESET button on the TWR-PXN20 module and follow the output information on the terminal screen. The installed program will display example outputs from the device and allow you to interact with the user buttons, user LEDs and others.

Additional Software and Tools

- CodeWarrior V10.x Eclipse Development Studio
- MQX™ Real-Time OS
- P&E OSBDM OSJTAG Virtual Serial Toolkit
- FreeMASTER Run Time Debugging Tool
- Green Hills Software MULTI IDE
- Serial Bootloader Utility
- Rapid Application Initialization and Documentation Tool (RAppID)

TWR-PXN20 Configuration Settings

The following is a list of all jumper options. The default installed jumper settings are shown in white text within the blue boxes.

General Jumper Configuration

Jumper	Position	Function
J2	1-2	Enable analog high reference voltage P3V3
J3	1-2	Enable push button 1
	3-4	Enable push button 2
	5-6	Enable LED1 enable
	7-8	Enable LED2 enable
J6	1-2	Enable potentiometer
J11	1-2	Accelerometer interrupt enable

System Jumper Configuration

Jumper	Position	Function
J1	1-2	CLKOUT to elevator enable
J8	1-2	Crystal clock
	2-3	Elevator clock
J9	1-2	Crystal clock
	2-3	Elevator clock
J10	1-2	Internal flash boot mode
	2-3	Serial boot mode
J29	1-2	OSJTAG bootload enable

CAN Configuration

Jumper	Position	Function
J15	1-2	On-board CAN transceiver termination enable
J26	1-3	CAN_C_TX is connected to elevator CAN_1_TX
	2-4	CAN_C_RX is connected to elevator CAN_1_RX
	3-5	CAN_E_TX is connected to elevator CAN_1_TX
	4-6	CAN_E_RX is connected to elevator CAN_1_RX
J27	1-3	CAN_D_TX is connected to elevator CAN_2_TX
	2-4	CAN_D_RX is connected to elevator CAN_2_RX
	3-5	CAN_F_TX is connected to elevator CAN_2_TX
	4-6	CAN_F_RX is connected to elevator CAN_2_RX

UART Configuration

Jumper	Position	Function
J17	1-3	UART_A_RX is connected to RS485 transceiver RO
	2-4	UART_A_TX is connected to RS485 transceiver DI
	3-5	UART_A_RX is connected to RS232 transceiver RX
	4-6	UART_A_TX is connected to RS232 transceiver TX
J18	1-3	Pin PG1 is connected to RS485 transceiver RE_N
	2-4	Pin PG0 is connected to RS485 transceiver DE
	3-5	Pin PG1 is connected to RS232 transceiver CTS
	4-6	Pin PG0 is connected to RS232 transceiver RTS
J20	1-2	On-board RS485 transceiver termination enable
J23	1-3	UART_B_TX is connected to elevator UART_0_TX
	2-4	UART_B_RX is connected to elevator UART_0_RX
	3-5	UART_B_TX is connected OSJTAG_TXD
	4-6	UART_B_RX is connected OSJTAG_RXD

Visit **freescale.com/TWR-PXN20** for the latest information on the TWR-PXN20 module, including:

- Module database: Schematics, layout and BOM
- User manual
- Quick start guide
- Software BSPs and CodeWarrior Development Studio
- Demos and tutorial
- Fact sheet

Support

Visit **freescale.com/support** for a list of phone numbers within your region.

Warranty

Visit **freescale.com/warranty** for complete warranty information.

For more information, visit freescale.com/Tower

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