

Description of the M5208EVB

Hardware

The M5208EVB is a programmable Evaluation/Demonstration [circuit] Board that showcases a number of new chips:

- Freescale Semiconductor Ltd's ColdFire MCF5208 microcontroller.
- Freescale Semiconductor Ltd's MC13192 2.4GHz ZigBee capable transceiver.
- National Semiconductor's DP83848 10/100 Ethernet Phy chip.
- To a lesser extent, AMD's AM29BDD160G flash memory.

In other words, the M5208EVB is a circuit board that has a number of new chips and it is built to show engineers how these chips can be connected to work together and programmed to perform useful tasks and do them quickly, effectively and economically:

- Communicate with other Ethernet enabled devices such as PCs over an Ethernet link.
- Communicate with other serial devices such as a host PC over a RS232 serial link.
- Communicate with compatible RF devices in the 2.4GHz band.
- Sense external switches or sensors to determine whether they are on or off.
- Actuate external devices such as indicator LEDs or relay drivers to turn them on or off.
- Accurately time events, such as pulses.
- Generate accurately timed events, such as pulses.
- Store, analyze and compute data.

The M5208EVB is designed to interact with an engineer's PC over a serial or Ethernet connection for programming and evaluation.

The evaluation board has 3 crystals and one oscillator:

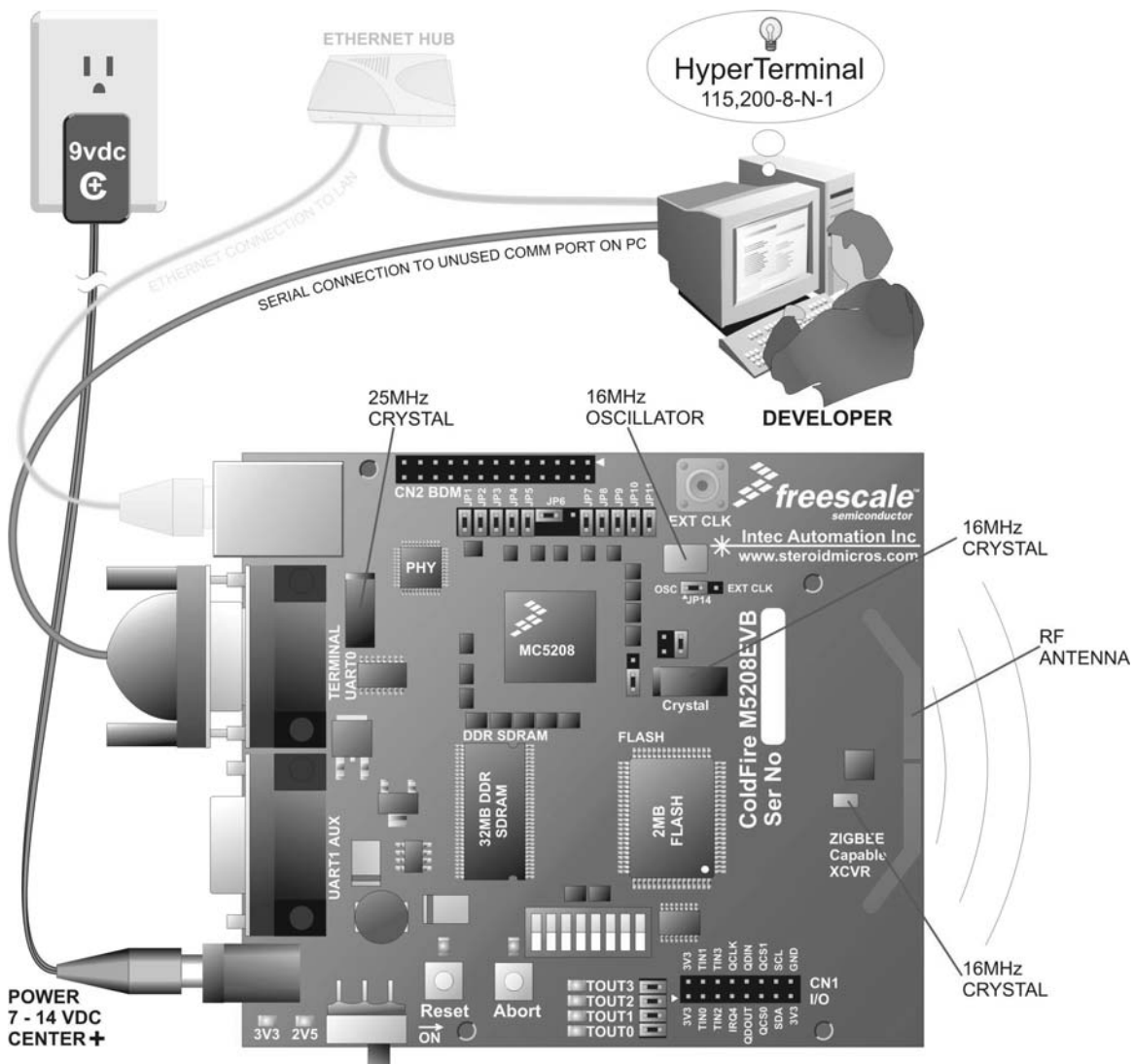
- MCF5208 microcontroller crystal: 16MHz.
- MCF5208 microcontroller oscillator: 16MHz.
- DP83848 10/100 Ethernet Phy crystal: 25MHz
- MC13192 RF transceiver crystal: 16MHz.

Through jumper setting, the EVB makes it possible for the MCF5208 microcontroller to be clocked by a 16MHz crystal, a 16MHz oscillator or an external 16MHz source. In addition, the EVB has a number of jumpers which can be used as current measurement taps to determine power consumption of the various modules within the MCF5208 chip.

The MCF5208 microcontroller is designed to run with a 166MHz internal clock frequency and an external [memory] bus frequency of 83MHz. However, the external RAM is DDR (Double data rate) SDRAM (Synchronous Dynamic RAM) that serves/accepts data at 166MHz.

The evaluation board is powered by a DC power source capable of delivering 5w at 8 to 14vdc, which is typically a wall-mount power adapter which has the necessary certifications. Input power is converted to 3.3v power through a switching regulator circuit that operates at 260KHz. Some of this 3.3v power is dropped to 2.5v and 1.5v, through linear regulators. The MCF5208 microcontroller uses 3.3v, 2.5v and 1.5v power. The memory chips use 2.5v power and the DP83848 Ethernet Phy chip and the MC13192 RFT transceiver are driven by 3.3v power.

The M5208EVB has a connector (CN2) that allows attachment of a Background Debug Mode pod. This is a device that allows the engineer to inspect and change memory, load, step through, inspect and execute code and to interrupt and change operation of the evaluation board.



RF Transceiver

The MC13192 transceiver covers 16 channels in the 2.4GHz band using 5 MHz of spacing between each channel, starting at 2.405GHz and going up to 2.480GHz. The transmitter output has 16 power levels ranging from -16.6 dBm to +3.6 dBm. The output power level and frequency channel are software selectable.

Operation

The evaluation board is shipped pre-loaded with software that executes as soon as the board is power up. This software consists of a serial monitor (low level operating system that communicates with a host PC through a serial port) and a demo program. The demo program is typically uClinux, which is a feature rich operating system, which in turn executes another demo program, Demo_CGI, which shows how the EVB can serve web pages, one of which allows the user to turn LEDs on the board on and off from anywhere in the world, over an Internet connection.

The engineer may load and execute a number of demo programs, each of which demonstrates different features on the evaluation board. Each program can be inspected, modified and [re]compiled on a host PC running Windows. The compiled code is downloaded from the host PC to the EVB through a DB9 cable (RS232 serial link). Software development software on the host PC interacts with the serial monitor on the EVB through this link. A second RS232 serial link allows demo programs on the EVB to interact directly with a terminal program (i.e., HyperLink) on the host PC.

One of these demo programs is Demo_sMAC, which demonstrates how the microcontroller interacts with the RF transceiver on-board, to send and receive wireless packets of information. This demonstration program requires another suitably programmed RF device with which to interact, such as another M5208EVB.

Some of these demo programs require the engineer to connect an output pin on the I/O Header (CN1) to an input pin, to allow the input pin to precisely detect changes in the output pin. The engineer may also connect pins on this header to external devices such as switches, indicator LEDs or even relay drivers, to exercise and test the features of the EVB.

Accessories

- 1 9vdc wall mount power adapter
- 1 7ft. Cat-5 Ethernet cable
- 2 6 ft. DB9 M/F serial cables
- 1 P&E MultiLink Debug pod c/w USB2 cable

In addition, users will require a PC or laptop computer running Windows 98 to XP.

An Ethernet hub is an added convenience.