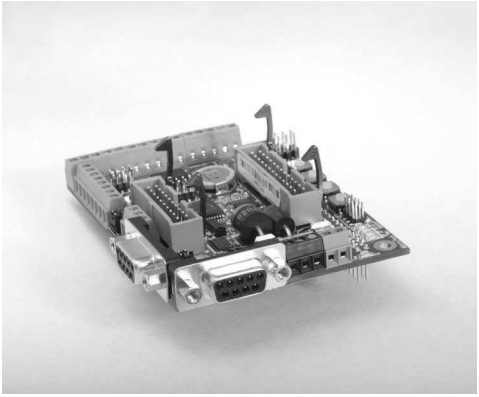
Industrial HC(S)08 SNAP Microcontroller MCB58



Features

- ✓ Freescale (Motorola) HC(S)08 40MHz controller with 50ns instruction time
- ✓ Small footprint: 3.55” x 2.65” x 0.5”
- ✓ 5-30VDC input range with safety ground
- ✓ Requires <300 mW of power
- ✓ 13 different options including PC/104, CAN, Isolated I/O, Analog, 8255, RTC
- ✓ Metrowerks CodeWarrior C-compiler for easy development
- ✓ Screw terminals for field wiring
- ✓ Extended temperature range available

The MCB58 offers a complete, easy to use hardware/software package for low-cost, low-power industrial designs. The Metrowerks CodeWarrior C-compiler and assembler, running on Win98/NT/2000/XP, is used to create programs for the MCB58. These programs are then downloaded and debugged in the MCB58 flash, through the provided serial cable.

The MCB58 integrates many peripherals that are often needed for OEM embedded systems as well as general housekeeping functions for machines and instruments.

The MCB58 is designed to handle the harsh electrical and mechanical environments of the industrial and automotive industries. Additionally, the MCB58 can be either bulkhead or DIN rail mounted. Screw terminals allow the board to connect directly to field wiring.

Software Support

CodeWarrior C/asm Compiler (4k limit). Runs on Win98/NT/2000/XP.

All CodeWarrior Compiler Upgrades. (32k limit, 64k limit, standard, etc).

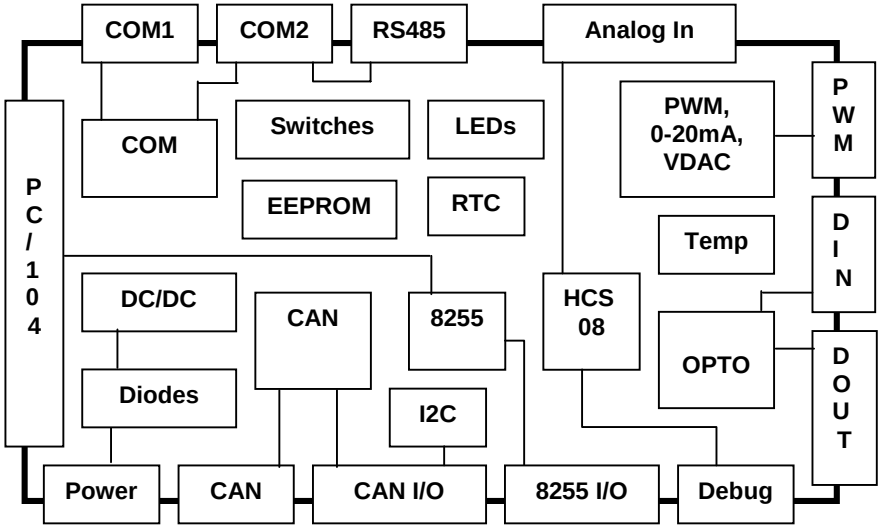
Compatible Hardware

MPC116, MPC132, MPC148, MPC196, MPC500, MPC550 MPC555, MPC624, Opto104, PS104,
RS232, RS485, CAN 2.0 A/B, I2C, 4-20mA, Dallas Probe
See Related Products from Metrowerks

Mounting/Packaging

PC/104
ENC104-4,
DIN rail (DRM01)
6 Mounting holes for OEM

Micro/sys 3730 Park Place, Montrose, CA 91020 (818)244-4600 Fax (818)244-4246
email: info@embeddedsys.com



Technical Details:

At the core of the MCB58 is a Freescale 8-bit HC(S)08 microcontroller. The microcontroller is optimized for high-performance, low-power applications. High performance is met with 50nsec instruction times and a highly C-optimized architecture. Integer math can be performed at 100,000 instructions per second while floating point math can be performed at 5,000 instructions per second. The HC(S)08 series of processors has multiple power management modes to provide low-power operation.

The internal debug module of the microcontroller, along with Metrowerks CodeWarrior, allow for very simple, but sophisticated debugging techniques, not normally found with 8-bit microcontrollers.

All signals going into and out of the MCB58 are protected against ESD and multi-board power-up sequencing problems. To meet industrial safety guidelines, the board has a safety ground that can be directly tied to chassis ground. An onboard resistor then bleeds off any static voltage that is present on the board.

The digital circuits on the MCB58 include eight isolated I/O and 40 TTL I/O lines. All of the lines have series resistors to prevent ESD and power sequencing problems.

The eight analog inputs (one is dedicated to measure input voltage) have 10-bit resolution and are scaled to handle different unipolar and bipolar voltages from 0-10VDC to ±34VDC.

The four analog outputs have a variety of functions, with the native state being pulse-width-modulation (PWM). If the onboard filters are installed, this PWM signal is converted to a voltage out signal (0-5VDC) or can be redirected to two channels of 0-20mA outputs.

The MCB58 can communicate with its surrounding environment through PC/104, RS-232, RS-485, CAN 2.0 A/B, and I2C.

The multi-functional MCB58 is a true systems integrator board.

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Specifications:

Mechanical:
- ❑ 3.55" x 2.65" x 0.5"
- ❑ 6 Mounting holes for PC/104, ENC104-4, DIN rail, or custom OEM board

Power Requirements:
- ❑ Jumper selectable
- ❑ +5VDC ±5%, 60mA typical, 300mW
- ❑ +5.5VDC to 30VDC
- ❑ Replaceable 500mA fuse (5 x 20mm)
- ❑ LC filter to remove line noise
- ❑ Safety ground provided on screw terminal and one mounting hole

Environmental:
- ❑ 0° to +70°C operating
- ❑ -40 to +85°C operating, -ET version
- ❑ 5%-95% relative humidity, non-condensing

Processor:
- ❑ 40-MHz HC(S)08 CPU
- ❑ On-chip debug interface
- ❑ Watchdog with Low voltage reset
- ❑ 60K program/data flash, 4K SRAM
- ❑ Benchmark: Floating point 5000/sec
- ❑ Benchmark: Integer math 100,000/sec
- ❑ 32 software IRQs
- ❑ 8 Channels of Timer/PWM/Counter

Serial Ports:
- ❑ COM1 – CodeWarrior download/debug
- ❑ COM2 – RS232/DB9 or RS485
- ❑ RS485 includes fail safe node termination and 100Ω isolated ground
- ❑ All ports have ±15kV ESD protection

Isolated Digital I/O (8 Total):
- ❑ 4 D_{OUT}, r_{ON} 10Ω, sink 200mA @ 250V_{PK}
- ❑ 4 D_{IN}, source 3 – 32VDC, 16mA Max
- ❑ 2 Timer/PWM also go to 2 of the 4 D_{OUTS}
- ❑ 2 of the 4 D_{INS} also go to counters
- ❑ 2 of the 4 D_{INS} also go to IRQs

Digital I/O:
- ❑ 82C55 provides 24 lines of TTL-level digital I/O, 2.5mA source/sink
- ❑ 26-pin locking header with grounds

Analog Inputs (8 Total):
- ❑ 3 Ch, 10-bit, 0 to 10.1VDC, Z_{IN} = 5kΩ
- ❑ 2 Ch, 10-bit, 0 to 20VDC, Z_{IN} = 5kΩ
- ❑ 2 Ch, 10-bit, ±34VDC, Z_{IN} = 21kΩ
- ❑ 1 Ch, 10-bit, measures input VDC

Analog Outputs (4 Total):
- ❑ 4 Ch PWM/DAC, 8mA source/sink
- ❑ Onboard filters turn PWM into VDAC
- ❑ 2 Ch 0 to 20mA transmitter, R_L <67Ω

Onboard Temperature Detector:
- ❑ Measures from –40° to +85°C, ±2℃

Real Time Clock:
- ❑ RTC with onboard battery

Control Area Network (CAN bus):
- ❑ Uses Intel 82527 CAN controller
- ❑ Supports CAN 2.0A/B
- ❑ ±80V fault protected transceiver
- ❑ Slope control to reduce EMI
- ❑ Onboard resistor for node termination
- ❑ Adds 8 TTL outputs, 8mA source/sink
- ❑ Adds 8 TTL inputs
- ❑ TTL – 20 pin locking header with grounds

Extended VDC Input:
- ❑ +5.5VDC to 30VDC input range
- ❑ Power the MCB58 directly from factory +24VDC or military +28VDC systems

Automotive Load Dump Diodes:
- ❑ +6VDC to 30VDC input range
- ❑ prevents circuit damage from automotive load dump transients

PC/104 Interface:
- ❑ Emulates the basic controls of an 8-bit PC/104 bus at 30kHz (1/10 the speed): IOW, IOR, Address, Data, IRQ, OSC.

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- Plug/mounts directly on a PC/104 stack
- Offers a low power CPU solution for a PC/104 stack
- Can be used with any I/O mapped I/O expansion board
- Board can power or be powered by the PC/104 stack

External and Onboard Interrupts:
- Main HC(s)08 IRQ can be selected from the PB IRQ switch, D_{IN} #0, CAN chip, or PC/104
- D_{IN} #2,#3 go to PA5,6 keyboard IRQs on the HC(s)08

LEDs/Switches/Miscellaneous:
- Power on LED
- 4 Programmable user LEDs
- 1 PB reset switch, 1 PB monitor/user switch, 1 PB IRQ switch, 1 PB user switch, 4 jumper switches
- 16k Serial EEPROM
- I2C Bus

Download/Debug Mode:
- Primary mode – Com1 (default)
- BDM – requires Metrowerks module

DK58 Development Kit:
- MCB58 quick start guide
- MCB58 user manual
- MCB58 support CD
- Metrowerks CodeWarrior CD – limited to 4k C-code and unlimited assembly
- RS-232 download/debugging cable
- World wide AC adapter (5VDC)
- 9 volt battery adapter
- 20 pin breakout board with cable
- 26 pin breakout board with cable
- 3 DIN rail mounting plates (DRM01)
- Screwdriver

External Connections:
- 3-pin screw terminal for power
- 2 DB9s for COM1 and COM2
- 6-pin debug port (Requires BDM)
- 5-pin screw terminal for Isolated D_{IN}
- 5-pin screw terminal for Isolated D_{OUT}
- 3-pin screw terminal for RS485
- 8-pin screw terminal for ADC
- 5-pin screw terminal for PWM/DAC
- 2-pin screw terminal for CAN Bus
- 20-pin locking header for CAN, I2C I/O
- 26-pin locking header for 8255 I/O
- 64-pin header for PC/104

Ordering Information:

MCB58	HC(s)08 Microcontroller
MCB58-ET	HC(s)08 Microcontroller, extended temp operation
DK58	Development Kit
58OPT1	4 Ch Isolated D_{IN}
58OPT2	4 Ch Isolated D_{OUT}
58OPT8	COM2 (RS232/RS485)
58OPT11	7 Ch 10-bit ADC
58OPT12	4 Ch PWM/DAC
58OPT14	Temperature Detector
58OPT15	Real Time Clock
58OPT20	2 Ch 0-20mA Transmitter (Requires 58OPT12)
58OPT22	1 Ch CAN, 16 DIO, I2C
58OPT24	8255 – 24 TTL DIO
58OPT30	Extended VDC Input
58OPT40	Automotive Load Dump (Requires 58OPT30)
58OPT104	PC/104 Interface (Power only, emulation requires 58OPT24)

Add -ET to option for extended temp oper.

Related Products:

BA0020	20 pin breakout board with cable
BA0026	26 pin breakout board with cable

Related Products From Metrowerks:

USBMULTILINKS08	BDM Module
CWHC08C32UPG	32K limit
CWHC08STD	Standard Edition

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