

# CDC 1651F-E

Aug/2005



## CDC 1651F-E 16-Bit Automotive CAN Controller

The CDC 1651F-E is a pin-compatible mask ROM derivative of Micronas' 16-bit Car Dashboard Controller family based on a WDC 65C816 CPU core.

The CDC 1651F-E offers 4 Kbytes of RAM and 128 Kbytes of ROM and 2 Kbytes of Special Function ROM. The device can be operated with an external quartz, at clock frequencies from 4 to 12 MHz. Communication is possible via one FullCAN module according to Bosch specification V2.0B. Only one single 5 V power supply is needed. Two low-power modes are available to reduce power consumption significantly.

The device also contains the patented built-in ERM (EMI Reduction Module).

### Features

- ◆ 128 Kbytes Mask ROM
- ◆ 4 Kbytes SRAM
- ◆ 2 Kbytes Special Function ROM
- ◆ Three CPU operation modes (Fast, Slow, Deep Slow)
- ◆ Two low-power modes (Idle and Wake)
- ◆ RTC delivering hours, minutes, seconds
- ◆ Polling/Flash timer output
- ◆ 4- to 12-MHz oscillator
- ◆ EMI reduction module (ERM)
- ◆ Digital watchdog
- ◆ Central clock divider
- ◆ Interrupt controller with 16 inputs and 16 priority levels
- ◆ Four port interrupts
- ◆ Regulator input supervision for reset/ alarm (alarm comparator)
- ◆ Clock and supply supervision
- ◆ 9-channel 10-bit ADC
- ◆ One comparator
- ◆ 48×4 LCD module
- ◆ DMA
- ◆ Two UARTs
- ◆ Two SPIs
- ◆ One CAN module with 256 bytes of object RAM according to Bosch specification V2.0B (16 message objects)
- ◆ Five stepper motor drivers
- ◆ Five PWM modules
- ◆ Sound generator with auto decay
- ◆ Two SW-selectable clock outputs
- ◆ 16-bit free-running counter with three capture/compare modules
- ◆ Patch module (up to 10 cells)
- ◆ 1×16-bit timer and 2×8-bit timer
- ◆ -40 to +105 °C case temperature range
- ◆ Single 5 V supply voltage
- ◆ Up to 85 GPIOs
- ◆ 100-pin PQFP package, 0.65 mm pin pitch

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## Development Tools

- ◆ Evaluation chip CDC 1605F-E featuring ROM/Flash emulation with external RAM (up to 16 Mbyte)
- ◆ Emulator and POD with analyzer or trace functionality from 3<sup>rd</sup> party vendor
- ◆ Application Board (APB) for Flash memory programming
- ◆ Software environment (compiler, linker, assembler) from 3<sup>rd</sup> party vendors
- ◆ RTOS from 3<sup>rd</sup> party vendors

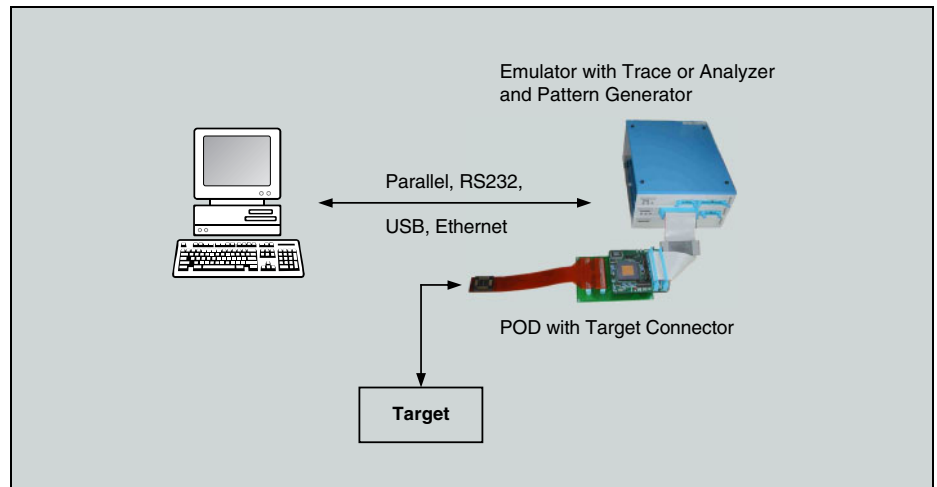


Fig. 1: Development tool setup

## System Architecture

The Car Dashboard Controller CDC 1651F-E contains a WDC 65C816 processor which operates at a maximum clock frequency of 12 MHz. An internal RC oscillator can provide an alternative clock signal to the RTC during power saving modes.

All I/O ports have multiple functions to obtain utmost flexibility. A total of 85 GPIOs can be selected.

The built-in ERM delivers superb EMI results reducing the peak values by up to 10 dBmV.

The CDC 1651F-E is fully pin- and software compatible to all other members of the CDC 16xyF family.

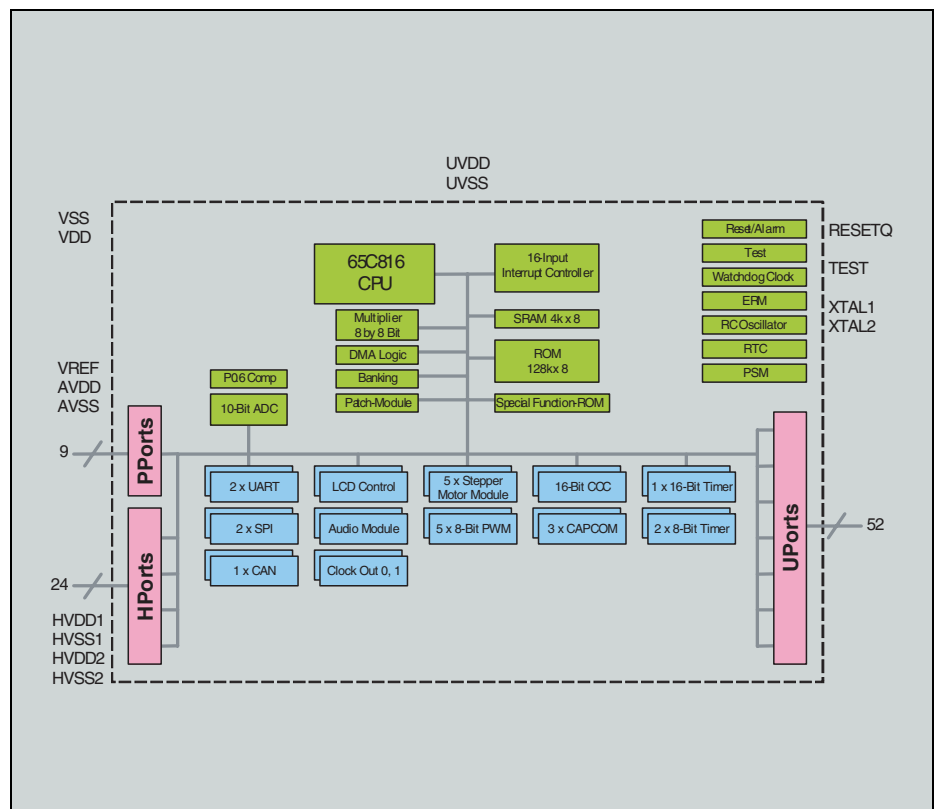


Fig. 2: Block diagram of the CDC 1651F-E

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