Utility Metering Solution

Z8 Encore! XP® F1680 Flash Microcontroller

ZiLOG

UTILITY METERING

Z8F1680 Series MCU

METERING TYPES SUPPORTED

- Gas and Water Meter

- Heat Meter

- Electricity Meter

FEATURES THAT SEPARATE US FROM THE REST

- Wide 1.8 V to 3.6 V low-voltage and low-power operation for extended battery life
- 8-Channel, 10-bit high resolution A/D converter for highly accurate, fast speed measurements
- 32 kHz secondary oscillator for software real-time clock operation
- Up to 256 Bytes NVDS with minimum 100,000 program/erase cycles for meter reading records
- Built-in analog comparator and Low-Voltage Detection (LVD) for low-battery detection
- Supports -40 °C to +105 °C extended temperature range for indoor or outdoor environments

Z8 ENCORE! XP® F1680 MICROCONTROLLER

The Z8 Encore! XP® F1680 Series is rich with new features including 1.8 V to 3.6 V operation, Program RAM (PRAM), Non-Volatile Data Storage (NVDS), fast 10-bit ADC, three enhanced 16-bit timers with Capture/Compare/PWM, Multi-Channel Timers, low-power Op-Amp, two Analog Comparators, a Temperature Sensor, two UARTs with Local Interconnect Network (LIN) and IrDA, a Master/Slave I2C, and an enhanced SPI interface. The Series also features an Internal Precision Oscillator (IPO) with ± 1% accuracy at 25 °C and a single-pin On-Chip Debugger (OCD) interface for debugging and in-circuit programming.

ZiLOG MEETS YOUR DESIGN CHALLENGES

Low Power Consumption

The Z8 Encore! XP® F1680 Series supports a wide of 1.8 V to 3.6 V voltage range and many power saving features. The on-chip PRAM can be used to shadow frequently executed program code such as scanning and Interrupt Sevice Routines (ISR) for an additional 30% power savings. The unused peripheral blocks can be disabled individually by software. These features dramatically reduce power consumption and maximize the durability of a typical LiSOCl$_2$ battery.

Fast Sampling of Analog Signals

The high-speed 10-bit Successive Approximation Register (SAR) ADC boasts a conversion time of less than 5 μs with internal or external voltage reference. This feature saves power by reducing sample time and allowing the part to quickly return to Stop mode.

Design Flexibility

With up to 24 KB Flash memory, 1 KB PRAM, 2 KB Register RAM, 256 B NVDS, and many feature-rich analog/digital peripherals, the F1680 Series provides superior design flexibility to cope with increasing system complexity.

System Cost

The highly integrated features of the F1680 Series can eliminate the requirement of a crystal, real-time clock, Op-Amp, or Serial EEPROM thus reducing the BOM cost for your design.

Better Noise Immunization

In many applications, external signal noise can be a serious issue interfering with the MCU's operation. The Series has a built-in IPO and noise filter that improves noise immunity and allows the device to operate even in worst condition.

Affordable and Efficient Tools

ZiLOG offers a comprehensive yet affordable design tool which ia available with a free license of ANSI C-Compiler, ZDS II-Z8 Encore! XP® IDE, real-time debug port, and a USB smart cable for connecting the PC to development kit.

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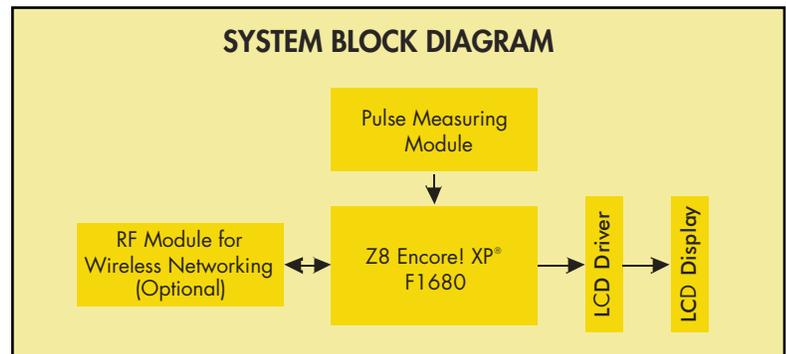
UTILITY METERING	Z8F1680 Series MCU

Z8 ENCORE! XP® F1680 FEATURES

- 20 MHz 8-bit eZ8 CPU core
- Wide low-voltage operation: 1.8 V to 3.6 V
- 8 KB, 16 KB, or 24 KB Flash program memory
- 1 KB PRAM
- 1 or 2 KB Register RAM
- Up to 256 B NVDS
- 8-channel fast 10-bit ADC
- Internal Precision Oscillator
- 32 kHz Secondary Oscillator
- Temperature sensor
- Two Analog Comparators
- Low-Power Operational Amplifier (LPO)
- Three 16-bit timers with optional two basic 16-bit timers (shared as UART baud rate generator)
- One 16-bit multi-channel Timer with four capture/compare/PWM modules
- Watchdog Timer (WDT) with dedicated internal RC oscillator
- On-Chip Debugger
- Low-Voltage Detection (LVD) and Voltage Brownout (VBO) protection
- Power-on-Reset (POR)
- Master/Slave I²C interface
- Enhanced SPI interface
- Two UARTs (support LIN and IrDA protocols)
- Up to thirty-seven 5 V tolerant GPIO
- Eight programmable LED Drive
- 20-, 28-, 40-, 44-pin SOIC, SSOP, PDIP, LQFP, and QFN packages
- 0 °C to +70 °C standard and -40 °C to +105 °C extended temperature ranges

FOR MORE INFORMATION

Visit us at www.zilog.com or call us at 1(866) GO ZiLOG or 408-558-8500

BLOCK DIAGRAM

Crystal/RC Oscillator	Internal Precision Oscillator	32 kHz Secondary Oscillator
8 KB, 16 KB, or 24 KB Flash	1 KB PRAM / Up to 256 B NVDS	1 or 2 KB Register RAM
Three 16-bit Timers/ PWM	**20 MHz eZ8 CPU**	Multi-Channel Timer
Up to 39 General-Purpose I/O pins		On-Chip Debugger
Watchdog Timer with RC Oscillator	LVD/ VBO and POR	Low-Power Op-Amp
Temperature Sensor	Two Analog Comparators	Up to 8 channel 10-bit ADC
Two UARTs with LIN and IrDA	Master/Slave I²C	Enhanced SPI

SYSTEM BLOCK DIAGRAM

Pulse Measuring Module

RF Module for Wireless Networking (Optional) — Z8 Encore! XP® F1680 — LCD Driver — LCD Display

Z8 Encore! XP® F1680 Development Kit

Kit Contents:
- Z8 Encore! XP® F1680 Development Board
- USB Smart Cable
- ZDS II Integrated Development Environment (IDE) with a full ANSI C-Compiler
- Quick Start Guide and User Manual

Ordering Information

Z8F16800144ZCOG: Z8 Encore! XP® F1680 Dual F1680 Development Kit
Z8F16800128ZCOG: Z8 Encore! XP® F1680 28-pin Development Kit