

Motor Control Solution

Z8 Encore! MC™ 8-bit Microcontroller
Only 8-bit MCU with Vector Control Ability



VECTOR CONTROL



FMC16100 Series MCU

MOTOR TYPES COMMONLY USED

- 3 Phase AC Induction
- Brushless DC (BLDC)

COMMON APPLICATIONS

- Washing Machines
- Fridges
- Freezers
- Pumps
- HVAC
- Conveyor Belts
- Fans/ Blowers
- Medical Equipment

FEATURES THAT SEPARATE US FROM THE REST

- 8-channel 2.5 μ s A/D Converter allows accurate current sampling
- Op-amp with external gain settings for current amplification and phase current reconstruction
- Comparator with programmable shutdown for over-current protection
- 3-phase PWM module optimized for motor control
- UART with LIN, SPI, I2C, communication peripherals
- 4% Internal Precision Oscillator over full voltage and temperature
- Only 8-bit MCU with vector control capability

THE Z8 ENCORE! MC™

During the last century, appliances have become an essential part of our lives. While cost savings have been a big focus during this period of time, today's consumers are more interested in the added value an appliance brings to its daily use. ZiLOG's feature-rich Z8 Encore! MC™ microcontrollers enable today's appliance design engineers to add many new differentiating features and meet the new market requirements. Combined with our easy-to-use development tools, reference designs, and software libraries, the Z8 Encore! MC™ microcontrollers help you to get to market faster than the competition.

INTELLIGENT CONTROL

ZiLOG has busted the DSP myth! A DSP or hybrid is no longer required to perform vector control algorithms. With ZiLOG's fast CPU, fast ADC, and integrated op-amp you can perform DSP functionality at a fraction of the cost. Why use a DSP when you can solve your problem in 8-bits? ZiLOG is the only MCU manufacturer that can offer vector control in 8-bits.

DESIGN CHALLENGES

Energy Efficiency

Our 2.5 μ s ADC with time stamp is tied to the PWM module and allows you more accurate control of the motor at lower or variable speeds to reduce power consumption. As well, vector control makes optimal use of motor energy. By using vector control, you will be able to reduce energy required for acceleration and adjust operating point to maximum efficiency.

Design Robustness

In appliance designs, motor noise can interfere with the MCU's operation. With our IPO and noise robustness, the Z8 Encore! MC™ MCU can operate even in the worst of conditions.

Differentiating Features

Microcontroller based design allows for ability to add more complex and differentiating features. With 16K of Flash and 17 GPIO you are able to add many bells and whistles to differentiate your product.

Quiet Operation

Keep your appliance system's audible noise low by using the soft start feature and ability to adjust the speed of the motor by using our advanced analog motor control features.

Lower Cost than DSPs

Our advanced 8-bit MCU with highly integrated feature set solves the same problem as a high dollar DSP. As well, ZiLOG's solution provides an integrated op-amp, comparator, internal precision oscillator, ADC, and PWM module.

Ultimate Control

Vector drives provide ultimate control of AC induction and brushless DC motors. Our solution provides full torque at zero speed, ability to directly command motor torque, tight speed regulation, and high speed operation.

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BLOCK DIAGRAM

12-bit PWM Module for Motor Control	16-bit Timer Capture Capture/Compare/PWM	Operational Amplifier with dedicated sample and hold
SPI, I ² C and UART with LIN	20MHz eZ8 CPU	8 Channel 10-bit ADC
Up to 512B RAM	Up to 16KB Flash	POR/VBO and Reset Control
Watch-Dog Timer	Debugger	Internal Precision Oscillator
Comparator		Interrupt Controller
Up to 17 GeneralPurpose I/O Pins		

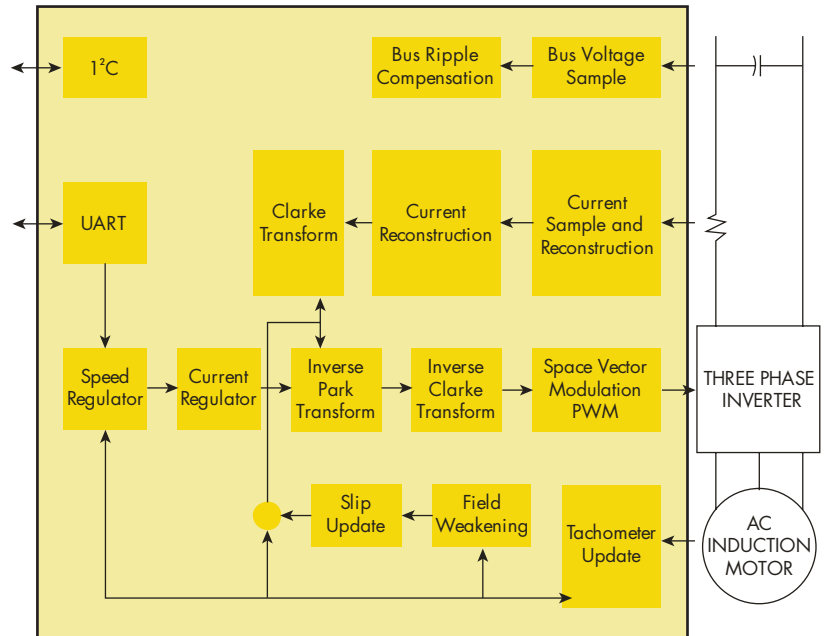
MCU FEATURES

- 20MHz CPU core
- Up to 16KB Flash memory
- Up to 512B RAM
- 6-channels of 12-bit PWM with fast shutdown
- 8-channel 2.5μs 10-bit ADC with internal reference
- Operational amplifier
- Analog comparator
- Internal Precision Oscillator
- UART with LIN, SPI, I²C
- One 16-bit timer
- Single-pin debug
- Watch Dog Timer (WDT), Voltage Brown Out (VBO),
- Power On Reset (POR)
- 32-pin QFN or LQFP
- 2.7-3.6V operation
- Standard (0° to 70°C) and extended (-40° to 105°C) temperature range (125° available upon special request)

REFERENCE TOOLS

- Software libraries
- Reference designs
- Application notes

Current Source Inverter Rotor Flux Oriented Control



DEVELOPMENT TOOLS INFORMATION

Z8 Encore! MC™ Z8FMC16100 Series MCU Development Kit

is the low cost motor control development tool which contains everything you need to evaluate and design your next motor control project. Includes:

- Brushless DC application board
- Z8FMC16100 series MCU development board
- Opto-isolated USB debugging and programming cable
- ZDS II Integrated Development Environment (IDE) with a full ANSI C compiler

Z8 Encore! MC™ Z8FMC16100 Series MCU In-Circuit Emulator Kit

is recommended for more advanced development with trace and event system. 32-pin adapters are available separately.

FOR MORE INFORMATION

Visit us at www.zilog.com or call us at 1(866) GO ZiLOG