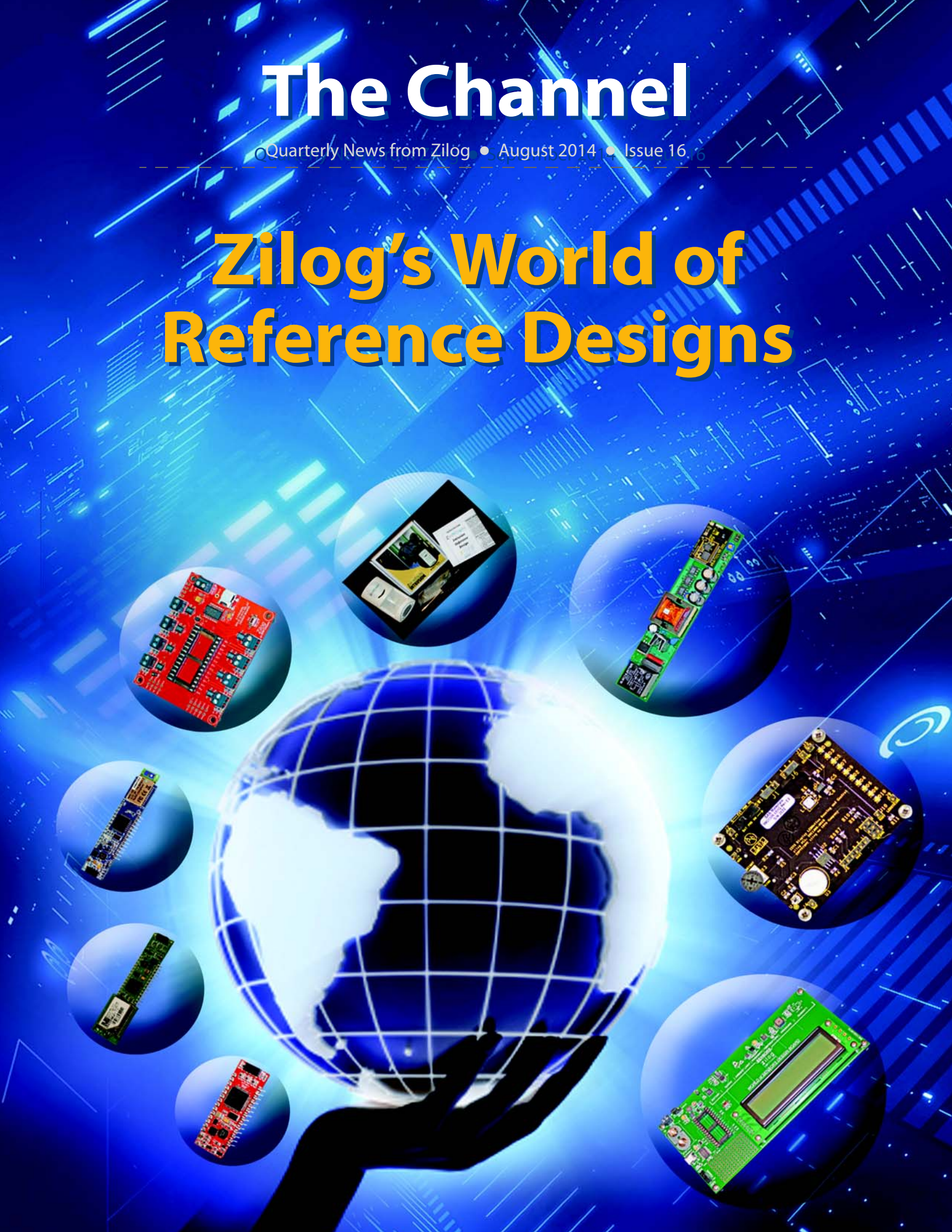
The Channel

Quarterly News from Zilog • August 2014 • Issue 16

Zilog's World of Reference Designs



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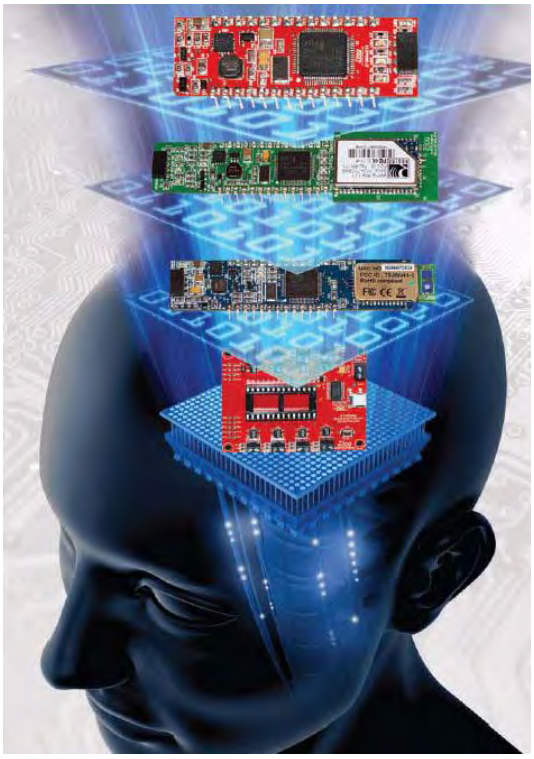
The Executive Corner

A World of Reference Designs

Welcome back to The Channel, Zilog's quarterly newsletter! Our team appreciates your continued support and enthusiasm for Zilog. We strive to bring you content that guides, informs, or piques your interest. In this issue, I would like to take a few moments to consider the overall value of providing pertinent reference designs and application notes to our customers. Though not a revelation, these reference designs and application notes, if well-executed, can help accelerate the product cycle or provide new design considerations.



At Zilog, we evaluate a project to determine whether it becomes an Application Note or a Reference Design. For ideas that can primarily be communicated in a document format, which may include sample code, application notes provide insights into utilizing a particular method. By contrast, a reference design provides all the components, i.e. hardware, software, and documentation, which make up a complete package for a particular application or usage model. Reference designs typically include associated libraries, databases, and in some cases, smartphone apps that can be effectively leveraged. Over the past few years, we have prioritized the development of multiple models to help customers realize that we look at a wide range of product areas in which microcontrollers are a good fit for the design.

Our new reference designs can be viewed on the Zilog and IXYS websites. Multiple types of designs covering a wide variety of enablement models are available, and can be ordered from our online stores or from our distributor, Digi-Key. For instance, we offer a series of 28-pin Mini-Z stamp modules, which are interchangeable with different boards and include an easy library for quick enablement. Zilog provides stand-alone reference designs for applications such as agricultural monitoring, digital signage management, multi-sensing boards, motion detection control, power line communication for motor control, and power management designs. We are now creating a line of Zduino modules to provide solutions in this creative space, particularly in areas where Zilog offers application relevance or unique features, such as in ZNEO 16-bit or ZMOTION microcontrollers.

One of our goals, which continue to evolve over the last few years, is to align Zilog in additional design spaces where we can potentially provide value-enabling ideas for existing product designs. This synergistic alignment not only helps us get back on track, but also enables us to provide our own considerations for an ever-changing development environment, regardless of the segments seeking innovative tools. Towards this end, Zilog is back with a world-class educational platform, which includes integrated boards for instructors and students that can be customized with modular shields complete with libraries and courseware. This is an area Zilog should never have fallen out of; however, with Zilog's renewed effort to go "back to school", it is a good example of our determination and commitment to our customers and future engineers in the industry.

As always, we cannot thank you enough for your support and feedback, which means so very much to a healthy organization. Zilog is back and listening!

Steve Darrough
Vice President, IXYS Worldwide Marketing
sdarrough@zilog.com ● (408) 644-6534

Product Spotlight

Zilog's product portfolio spans a broad range of solutions for the industrial and consumer markets. This issue features some of our newer technologies and product offerings.

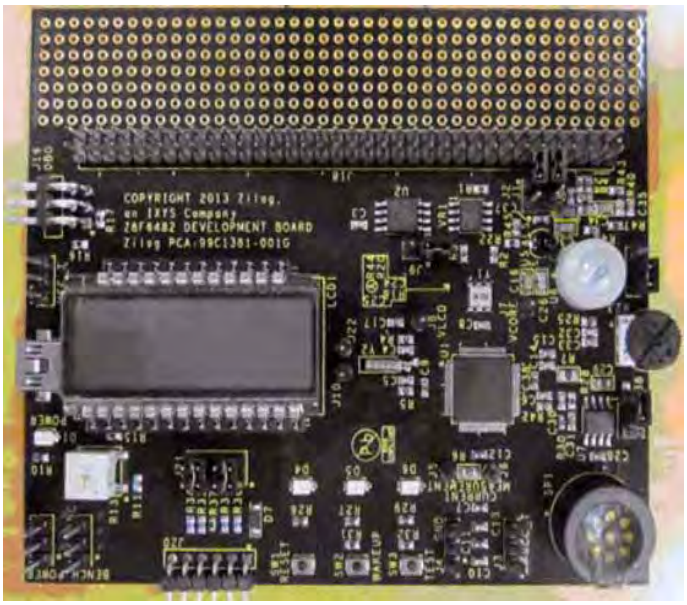
Z8 Encore! XP F6482 Series Microcontrollers

Zilog's F6482 Series MCUs, members of the Z8 Encore! XP family, are based on our advanced 8-bit eZ8 CPU core. These microcontrollers support 1.8 V to 3.6 V low-voltage operation with extremely low Active, Halt, and Stop Mode currents and offer an assortment of speed and low-power options.

The F6482 Series features 26 to 67 port pins (Ports A–J) for general-purpose input/output (GPIO). The number of GPIO pins available is a function of package. Each pin is individually programmable.

Features

- 24MHz eZ8 CPU core
- 16KB, 32KB, 60KB or 64KB Flash memory with in-circuit programming capability
- 2KB or 3.75KB internal RAM
- Up to 128 bytes Non-Volatile Data Storage (NVDS)
- 12-bit (or 14-bit 2-pass) Analog-to-Digital Converter
- 12-bit Digital-to-Analog Converter (DAC)
- On-Chip Temperature Sensor
- Two on-chip low power analog comparators
- Two on-chip, low-power operational amplifiers
- 8-Channel Event System provides communication between peripherals for autonomous triggering
- Full-Speed Universal Serial Bus (USB 2.0) device supporting eight endpoints with integrated USB-PHY
- Three enhanced 16-bit timers with Capture, Compare, and PWM capability
- Two additional basic 16-bit timers with interrupt (shared as UART Baud Rate Generator)
- 16-bit Multi-Channel Timer which supports four Capture/Compare/PWM modules
- Watchdog Timer (WDT)
- 26 to 67 General-Purpose Input/Output (GPIO) pins, depending upon package
- Up to 41 interrupt sources with up to 30 interrupt vectors
- On-Chip Debugger (OCD)
- Wide operation voltage range: 1.8 V–3.6 V
- 32-, 44-, 64-, and 80-pin packages
- –40°C to +85°C extended operating temperature range



F6482 Series Development Board

Applications

- Battery Powered Sensors
- Wired/Wireless Keypads
- PIR Motion Detection
- Lighting Control
- Safety and Security
- Utility Metering
- Digital Power Supervisory
- Hand Held Electronics
- Wireless Controller
- LCD Keypads

F6482 Series Development Kit

The F6482 Series Development Kit is a complete development solution containing the following tools:

- F6482 Series Development Board
- USB SmartCable (for connecting the PC to the F6482 Series Development Board)
- USB A to Mini B cable
- RS-232 interface module

Z86C08 High Temperature ROM

Zilog's High Temperature Masked ROM Z86C08 MCU is suitable for applications that require a general-purpose MCU to operate at sustained elevated temperatures. Unlike Flash-based MCUs that are guaranteed to operate at 150°C for only 40 to 310 days, the High Temperature Z86C08 MCU can operate at a prolonged temperature of 150°C for many years without experiencing program memory data retention issues.

For applications demanding powerful I/O capabilities, the Z86C08 MCU's dedicated input and output lines are grouped into three ports, and are configurable under software control to provide timing, status signals, or parallel I/O.

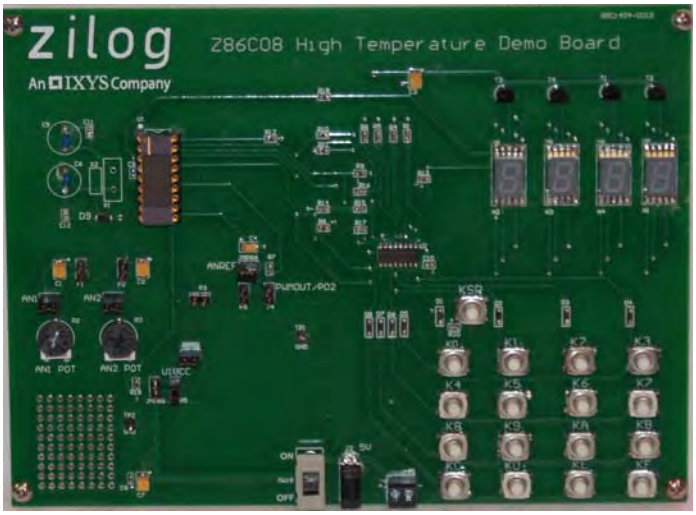
Two on-chip counter/timers, with multiple user-selectable modes, offload the administration of real-time tasks such as counting/timing and I/O data communications.

Features

- Fast Instruction Pointer (1 µs @ 12 MHz)
- 2 Analog Comparators
- Program Options:
  - Low Noise
  - ROM Protect
  - Auto Latch
  - Always-Enabled Watchdog Timer (WDT)
  - RC Oscillator
  - 32kHz Operation
- WDT/Power-On Reset (POR)
- On-Chip Oscillator that accepts Crystal, Ceramic Resonance, LC, RC, or External Clock
- 2 KB Program ROM
- 125 Bytes RAM
- 3.5V to 5.5V operation from –40°C to 150°C

Advantages

- Guaranteed to operate at prolonged high temperatures
- No loss of data retention
- Best-in-class performance
- Improved reliability
- Extended product lifetimes
- Cost savings



Z86C08 High Temperature ROM Board

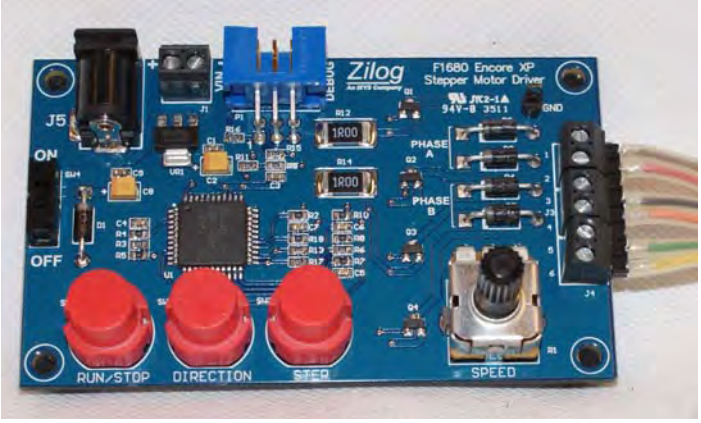
Applications

- Automotive Systems
- Aircraft Propulsion Systems
- Deep Drilling
- High-Power Motors
- High-Power Generators
- Natural Resource Exploration/Production
- HVAC Applications
- Industrial/Instrumentation Systems
- Distribution Control
- Military Systems

Microstepper Motor Reference Design

Zilog's Z8F1680 MCU-based Microstepper Motor reference design offers a complete and easy-to-use platform that demonstrates the feature set of the Z8F1680 microcontroller, which is optimized for microstepper motor control.

This Microstepper Motor Design Board drives a unipolar stepper motor using the Z8F1680 MCU's onboard analog comparators for one-shot feedback current limiting. It also uses the Z8F1680 MCU's multichannel timer as a microstepper sine/cosine current generator.



Microstepper Motor Reference Design Board

Microstepping, or sine/cosine microstepping, is a stepper motor drive technique in which the current in the motor windings is controlled to approximate a sinusoidal waveform. Microstepping produces a much smoother rotation than that of a full step drive, plus it provides greater resolution and freedom from resonance problems because it involves more steps per revolution.

Features

- Stepper motor
- Sine/cosine microstepping
- Current limiting
- Speed control
- Directional control of the motor
- One-step advancing of the motor
- Current generator for each coil

Applications

- Precision surgical procedures
- Motorized position camera
- HVAC coolant control
- Robotic arms for a factory production line
- Robot controls
- Valve control for a fluid control system
- Motorized curtains or window cover controls
- Laser or optical precision positioning equipment
  - Linear actuators
  - Linear stages
  - Goniometers
  - Mirror mounts
- Packaging machinery
- CD/DVD disk drives
- Flatbed/image scanners
- Computer printers
- Plotters
- Slot machines
- Intelligent lighting
- Retrieval or exploration/drilling machinery

Ordering Information

Visit the Zilog Store to order the Microstepper Motor Design Board individually or as part of the Design Kit, which includes a stepper motor and power adapter.

Application Starting Points: Cookbook and Cut Sheets

Design for Success

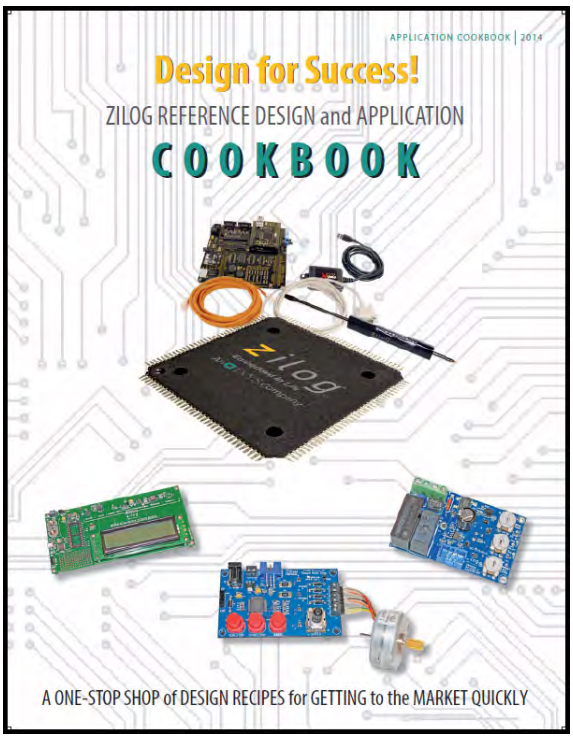
Zilog's Reference Design and Application Cookbook is a collection of design recipes from our comprehensive library of application solutions which will simplify your application development process and bring your products to market quickly.

The 2014 edition of our Application Cookbook is available in Flash and PDF formats – you'll find it in the Quick Links section of the zilog.com home page.

Cut Sheets

Are you looking for ways to select and use the right products? Zilog's application cut sheets are the perfect resource to keep at your fingertips. Our cut sheets give you information at-a-glance about our products, including product features and technical specifications, as well as links to additional documentation.

Zilog's cut sheets are a one-stop solution to enabling your applications in areas such as Motor Control, Motion Detection, and Battery Charging Solutions. Go to zilog.com and select from the options under Applications → Application Solutions.



Zilog Reference Design and Application Cookbook

Zilog Online Video Gallery

Are you a visual learner? Do you prefer to see how something is done rather than read about it? If so, we have an ideal solution for you: Zilog's instructional videos!

Visit the Zilog Online Video Gallery to view training and general-purpose videos about Zilog and its technologies.

Tune into ZilogTV, our YouTube channel! Watch videos by Zilog engineers about topics such as motor control, motion detection, and remote control connectivity, and then talk about them in the Discussion area.

Stay tuned for new videos featuring Zilog's Education Solutions!

New in the Zilog Store

Opto-Isolated USB SmartCable

Zilog's Opto-Isolated USB SmartCable is now available in the Zilog Store. This SmartCable allows you to connect a Z8 Encore!, Z8 Encore! XP, Z8 Encore! MC, ZNEO, or Z16FMC development board to a high-speed or full-speed USB port on any Zilog Developer Studio II (ZDSII)-equipped host system.

This USB SmartCable's internal optoisolator electrically isolates it from the circuitry of your Zilog development board, thereby preventing high input voltages from affecting the system receiving the output signal.

Zilog's Opto-Isolated USB SmartCable is also RoHS-compliant.

Opto-Isolated USB SmartCable

Z8F2480 Power Monitor with eZ80F91 Webserver

Zilog's Z8F2480 Power Monitor with eZ80F91 Webserver Reference Design is a recent addition to our Store. This reference design demonstrates the effectiveness of using an optically-isolated Z8F2480 MCU-based power monitor to measure AC input voltage, AC load current, voltage/current phase shift, the power factor of the load, and to communicate via a standard Ethernet interface and webserver.

The Z8F2480 MCU and the eZ80F91 Webserver Module are connected for easy mounting. The load is powered via a single-phase AC line with voltage in the range of 90 V to 240 V RMS at 50 Hz or 60 Hz. The Z8F2480 MCU-based power board provides current to a power load and provides optically-isolated I^2C signals to communicate with the eZ80F91 Module.

Z8F2480 Power Monitor with eZ80F91 Webserver

This reference design can be used as a basis for developing systems that can control different power installations, including motors and lighting ballasts.

The Z8F2480 Power Monitor with eZ80F91 Webserver Reference Design ships with the following items:

- Z8F2480 AC Monitor Power Board
- eZ80F91 Webserver Module
- 5 VDC power supply
- UART-to-RS232 adapter

Order from the Zilog Store

The Opto-Isolated USB SmartCable and the Z8F2480 Power Monitor with eZ80F91 Webserver Reference Design are both available in the Zilog Store.

Wireless Agricultural Monitoring System

Zilog will soon introduce an agricultural monitoring system based on wireless sensor network technology.

Zilog's Wireless Agricultural Monitoring System (ZWAMS) uses the latest technology to help farmers increase crop yields by providing information that enables them to use their limited resources strategically. The comprehensive dataset compiled by the ZWAMS system allows farmers to proactively monitor their crops and avoid environmental states that are precursors to plant disease.

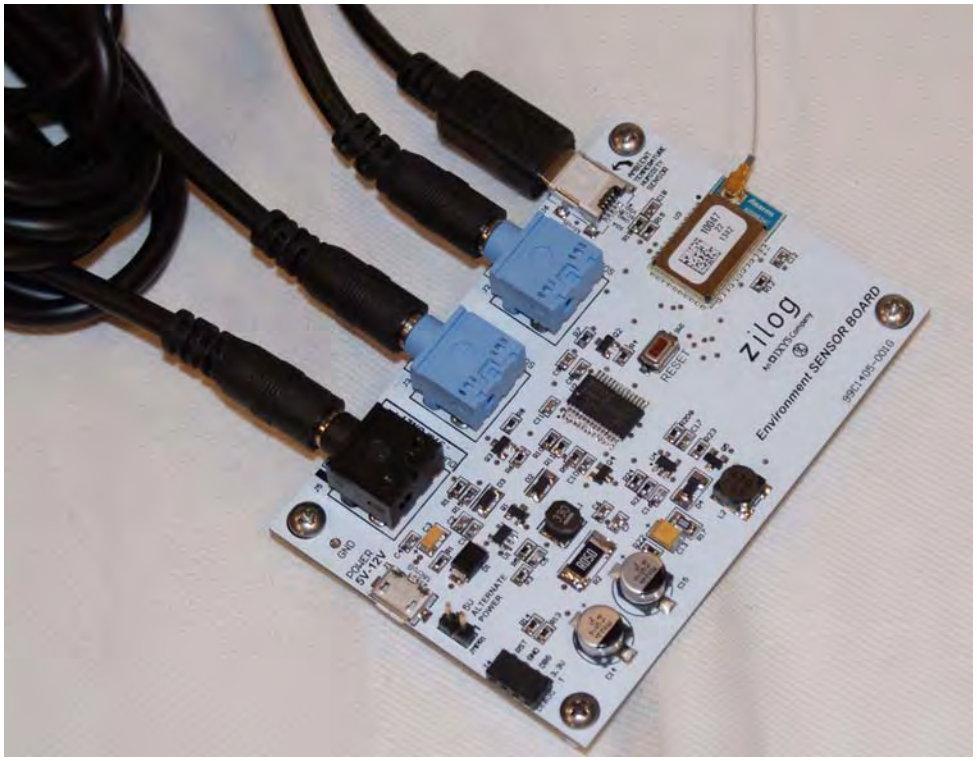
The ZWAMS system consists of the following three circuit boards that work together to gather environmental data and transmit it for interpretation via the cloud computing model:

- Zilog's Mini-Z ZNEO GSM module, which is used to uplink data to the external software service provider's server
- A Bridge Board that collects information from a network of sensors deployed in a crop field
- One or several Z8 Encore! MCU-based Sensor Nodes that gather measurements of ambient temperature and humidity, soil temperature and humidity, and foliage humidity

ZWAMS uses a GPRS/GSM Radio to communicate with the cloud services provider. Environmental data is transmitted within the network via ZigBee Radio. Solar panels can be used to supply power to the system.

Advantages

- Enables close monitoring of crop-growing environments
- Efficient water distribution
- Allows for optimal use of fertilizers
- Cost effective
- Helps farmers be better environmental stewards



Zilog Wireless Agricultural Monitoring System

Tips from Professor Ken

Stuck on a designing problem? Have a question about a Zilog product? Our very own Professor Ken has the answers you're looking for!

Q What is the Moisture Sensitivity Level (MSL) for Zilog's classic products?

A For PLCC, QFP, LQFP, QFN, and LBGA packages, the MSL is 3.

The PDIP, SSOP, and SOIC packages are not moisture sensitive.

Q Can /TXOUT be used in the PWM Single Output Mode for the Z8 Encore! XP F1680 Series of MCUs?

A /TXOUT can only be used in Dual PWM Mode for the F1680 Series of Microcontrollers.

Q What needs to be done on the Z6F1680 Development Board to have the T0OUT and /T0OUT signals monitored on the P2 connector?

A The Z8F1680 Development Board must have 0Ω resistors installed for R20 & R21 so that the T0OUT & /T0OUT signals can be monitored on the P2 connector.

Q How can the Z8 Encore! Z8F0830 comparator output be monitored using an oscilloscope?

A When the comparator for the F0830/F0831 device is enabled and operating, the output of the comparator is displayed on the PC3 pin if the alternate function on the Alternate Function Register is selected. The PC3 pin in the Alternate Function Register for the C0OUT pin function must be enabled if you want to monitor the comparator output with an oscilloscope.

Q The eZ80F92 Product Specification (PS0153) mentions that it has a Flash information page. However, nothing is discussed about how to access this page. Is it accessible to users similar to the eZ80F91 device?

A Yes, you can access the Flash information page in the manner described in the eZ80F91 Product Specification (PS0192). We are also updating PS0153 to reflect this information.

Tools Developments

Zilog tools enable engineers to evaluate the features of Zilog products. Whether in evaluation or preliminary development, the Zilog toolset offers you flexibility and functionality in the development environment.

Development Tool Kits

Zilog's development toolkits provide a fully functional and flexible environment to ease the design of your innovative applications. Two of our recently-released development kits are featured here.

S3 Flash In-System Programmer

Zilog's S3 Flash In-System Programmer (ISP) provides an interface between any development or application board with an S3 microcontroller device to the high-speed USB port of a PC on which Zilog Developer Studio II for S3 Family devices (ZDSII – S3) is installed.

The ISP allows the Flash memory space on any S3 Family device to be programmed, and also offers limited debugging capabilities when used together with the Zilog Debug Library.

The S3 Flash In-System Programmer Kit

The following features are available with the S3 Flash In-System Programmer when using ZDSII for S3 Family devices:

- Download code to Flash and begin program execution
- Break program execution arbitrarily
- Insert multiple breakpoints in a program at compile/assembly time; only one breakpoint is triggered during program execution
- After an arbitrary break during breakpoint execution, the status of the chip can be examined in ZDSII – S3.

Kit Contents

- S3 Flash In-System Programmer
- USB cable with Type-A and Type Mini-B connectors
- 10-wire ribbon cable

Zilog's S3 Flash In-System Programmer is RoHS-compliant.

S3F80QB Development Kit

Evaluate your universal remote control designs and applications using Zilog's S3F80QB MCU with the S3F80QB Development Kit, a complete development solution that provides all of the necessary hardware and software tools to get you developing quickly.

The S3F80QB Development Kit contains the following items:

- S3F80QB Development Board
- S3 Flash ISP
- 10-circuit ribbon cable
- USB A (male) to Mini-B USB cable (2)
- S3F80QB Development Kit hardcopy insert

The S3F80QB Development Kit is RoHS-compliant.

The S3F80QB Development Kit

This S3F80QB Development Board itself contains the following components:

Hardware

- S3F80QB MCU in a 44-pin QFP package featuring:
  - 8 MHz
  - 63 KB internal Flash
  - 1 KB internal RAM
- USB interface
- Four LEDs
- Seventeen pushbuttons
- Buzzer/speaker
- Four high-power infrared (IR) emitting diodes
- IR receiver module
- Device pin headers

Software

Download the following free software from the Zilog Store:

- ZDSII IDE for the S3 Family, version 5.2.0 (Beta 1) plus sample files and documentation (Product ID SD00029)

Order either of these kits at you local distributor, whom you can locate on the Zilog Worldwide Sales Locations page.

Software Downloads

We offer multiple downloadable software files in the Zilog Store. You'll find the Zilog Real-Time Kernel and TCP/IP Stack here, plus two flavors of SSL plug-ins. There's lots of free stuff here too!

Here are some of Zilog's new and updated software releases:

ZDSII – Z8 Encore! version 5.2.0 Version 5.2.0 of Zilog Developer Studio II for Z8 Encore! offers debug and development support for Zilog's Z8 Encore! XP and Z8FMC16 product families. This v5.2.0 version also includes a Board Support Package for F6482 Series devices. The Product ID is SD00027, and you can download it for free.

ZDSII – S3 version 5.2.0 Beta 1 This beta version of Zilog Developer Studio II v5.2.0 for S3 offers debug and development support for Zilog's S3 product line, and is free to download (Product ID SD00029). This initial release of the ZDSII software for the S3 Family includes an assembler, a linker/locator, a librarian, a disassembler, and an ISP programmer and debugger.

Application Solutions

Our newest application solutions continue to support your design goals by offering powerful functionality to reduce the time and effort it takes to develop your applications. Take a look at our recently published Application Notes.

- Field Oriented Control Using Polar Coordinates for ACIM Motors (AN0374)
- BLDC Motor Control Using Sensored Sinusoidal PWM Modulation with the Z16FMC MCU (AN0355)
- Space Vector Modulation of a 3- Phase BLDC Motor with the Z16FMC MCU Application (AN0354)

Motor Control Brochure

Our new Motor Control Brochure is a source of information about optimized motor control strategies and solutions relevant to today's industry requirements. Zilog's motor control technologies make use of custom code development and embedded software to leverage motor control capabilities.

Topics covered include control strategy by motor type, characteristics and applications of various motors, and Zilog's MultiMotor Series Development Kit.

Zilog Community

Zilog Online Community Forum

The Zilog Forum is the place to get solutions to your application design questions. Interact with Forum members to share information, ask questions, and get updates about Zilog products.

In addition to our Technical Support site and Knowledge Base, the Forum offers another way to learn about Zilog's MCUs, reference designs, and development tools. This online community is organized into several broad categories that allow you to quickly post or find relevant threads.

Join the conversation and interact directly with our technical engineers who work on Zilog technologies! Discuss industry best-practices, and find out more about Zilog's initiatives by actively participating in a topic of your interest.

You can also perform a search on Forum posts; you may just find that a question that's on your mind has already been addressed.

If you're not yet a member of the Zilog Forum, it's easy to join. Register today and start posting. We look forward to seeing you there!

Follow Zilog on Social Media

If you haven't checked out Zilog's social media pages lately, a number of exciting new changes have occurred. Zilog has an updated presence on Facebook, LinkedIn, Twitter, and YouTube.

We welcome you to visit and participate in these online Zilog communities. To get started, click any or all of the 4 social media platform links on page 2 of this newsletter, or find them on the zilog.com home page.

Zilog News and Events

Zilog Announces the Z8F2480 Power Monitor with eZ80F91 Webserver

A Reference Design for Energy Efficiency with Digital MCU Technology

Milpitas, CA and Leiden, The Netherlands. August 12th, 2014 – Zilog, an IXYS Company (Nasdaq: IXYS) and the legendary supplier of microcontrollers (MCUs) providing solutions for the industrial, telecommunication, automotive, and consumer markets, introduces its Z8F2480 Power Monitor with eZ80F91 Webserver to expand its portfolio of reference designs which accelerate time to market solutions. This new reference design targets remote-operated AC motors and remote-operated commercial/architectural lighting control applications.

This reference design integrates a Z8F2480-based AC power monitor with Zilog's eZ80F91 Webserver Module to showcase the capability of an optically-isolated Z8F2480 MCU-based power monitor to measure AC input voltage, AC load current, voltage/current phase shift, the power factor of the load, and to communicate via a standard Ethernet interface and webserver. The Z8F2480 MCU and the eZ80F91 Webserver Module are connected for easy mounting. The load is powered via a single-phase AC line with voltage in the range of 90 V to 240 V RMS at 50 or 60 Hz. The Z8F2480 MCU-based power board provides current to a power load and provides optically-isolated I^2C signals to communicate with the eZ80F91 Module. This reference design can be used as a basis for developing systems that can control different power installations, including motors and lighting ballasts.

Key Features

This reference design features the following elements:

- 90 –240 V AC RMS input voltage range
- Load current up to 3 amps
- Less than 5 mA average current consumed from an AC line in either monitoring or standby modes
- 3750 V isolation voltage between the AC line and the eZ80F91 MCU

Potential Applications

This reference design can be used to develop a number of applications; the brief list below offers examples.

- Remote-operated commercial or architectural lighting monitors
- Remote-operated AC motors or other devices
- Remote UPS monitoring
- Remote power usage monitoring
- Green Energy power generation monitoring
- HVAC power usage monitoring

Zilog continues to expand its array of new turn-key reference designs to assist and accelerate design time. "Zilog is also now creating reference designs in concert with our strategic customers toward building integrated solutions which promote both companies' products for strong system-level designs," remarked Steve Darrough, Zilog's VP of Marketing.

Zilog's Z8F2480 Power Monitor with eZ80F91 Webserver reference design is now available for customers that place orders through the Zilog Store. For more information, visit the Z8F2480 Power Monitor with eZ80F91 Webserver Reference Design page on the Zilog website.

Techno-Frontier 2014, July 23-25 in Tokyo, Japan

J REP, our distributor in Japan, participated in Techno-Frontier 2014, from July 23–25, 2014 in Tokyo, Japan.

Techno-Frontier is a cutting edge technology-oriented exhibition in the field of electro-mechanical parts and devices. The J REP exhibit, called The World of IXYS, primarily showcased IXYS products, and was successful in attracting a large number of visitors to the booth. The exhibit also introduced Zilog's product line to potential customers, which also generated a lot of interest.

Zilog News and Events (continued)

The World of IXYS Booth at Techno-Frontier 2014

Upcoming Events

Torex Japan to Exhibit IXYS Power Semiconductor Products

Zilog's distributor, Torex Japan, will participate in a series of product exhibitions later this year to introduce IXYS Power Semiconductor products at customer sites such as Toshiba, Panasonic, Sharp, and Casio. For more information about IXYS products, visit ixys.com.

North America Sales Representatives Training Nov 6-7, Beverly, MA

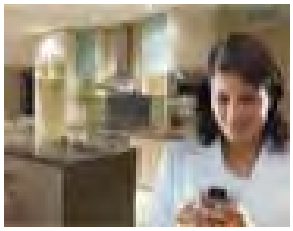
IXYS will conduct a two-day sales training program in their ICD division at Beverly, MA from November 6-7, 2014. This training session is intended to provide a comprehensive understanding of IXYS products, target markets, key features, plus the opportunity to interact with IXYS experts.

This training program is tailored to sales and distribution professionals who seek to achieve increased sales growth in their companies. It will also be valuable for application engineers who would like to understand IXYS technologies and how they are utilized in designs and applications, as well as to IXYS distributors who need to be aware of the broadening goals, products, and policies of IXYS.

Archive

Back issues of The Channel are one click away. Happy reading!

Issue 1
June 2008



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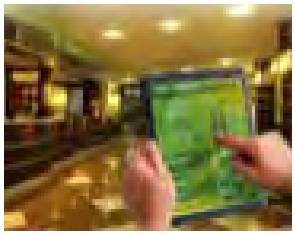

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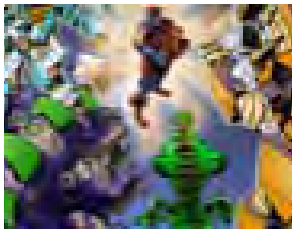

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April 2011

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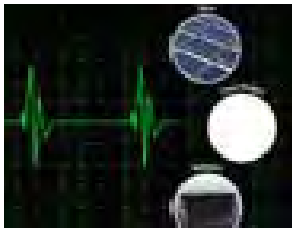
August 2011



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November 2011

Issue 10
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Issue 11
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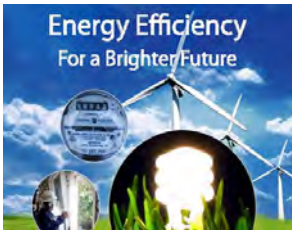

Issue 14
November 2013

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May 2014