The Channel

Quarterly Newsletter from Zilog • April 2015 • Issue 18

The Internet of Things

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The Executive Corner

The Internet of Things – The Next Big Thing?

The Internet of Things (IoT), or "skynet", has finally come into being. Is this truly a new level of technology development that has real demand in having everything-everywhere connected, or is it just an industry-created buzz to force new interest in products, services, and applications?

For most of us living the tech trends, we have seen a lot of convergence models over the years. Is the Internet of Things a continuation of this evolution of technologies? Is it a new trend looking for a home and if so, should we all jump onboard or develop a wait and see approach? These industry initiatives tempted many companies into pouring millions of dollars into an unsustainable demand creation model in the absence of real consumer or industrial need, just to watch that bubble burst. Look at Interactive TV where so many companies ran headlong into the fray and lost everything during the dot com craze until it hit its final reality check.

IoT has once again acquired significant focus across many segments, which are rapidly moving to produce and announce that they are in the game and have products very well suited for multiple applications. The number of connected things is set to explode, with Gartner forecasting it will reach 25 billion by 2020. The current belief is that the Internet of Things will have momentous impact, which is encouraging many companies to jump on the IoT train than be left standing at the station. Of course, many of the existing products can easily be shifted to be positioned as solutions, which may be faster and safer.

With this race to connect everything, just about anything is fair game now, from toasters to televisions, from big data mining to cloud management. Within the next five years, more than 90% of all IoT data will be hosted on service provider platforms as cloud computing reduces the complexity of supporting IoT "Data Blending". There is truly a wide arena of places that companies can focus on and put a stake in the ground. It would benefit each company to do an assessment of their products and services and see how they add value by connecting the dots in the IoT ecosystem.

A few considerations may be worth a look in finding those gaps or sweet spots that line up nicely regardless of the company's core efficiencies. For Zilog, as a part of the World of IXYS, its key competency is MCUs. For IXYS Power groups, it's the "power" itself which is the constant for all of the IoT models that need to run. Our newest group, Radio Pulse, has the Zigbee "one chip wonder", differentiated with outstanding capabilities at an extremely competitive price. We also have a multitude of microcontrollers with embedded smart software that provides the intelligence to both communicate and support the application needs to link into these new devices and services. Some of these can add an additional layer of device level security, such as our ZGATE products.

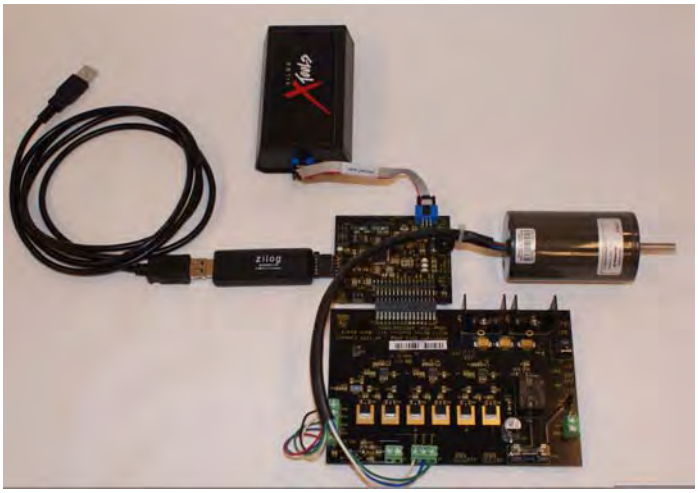
Irrespective of the role each of our companies plays in this new frontier, part of our opportunity and challenge is to create good product awareness and demonstrate how it fits into the greater IoT structure. Zilog and our team continues to grow and improve our own solutions while working with you, our most valued partner in creating the future together!

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

Product Spotlight

MultiMotor Series Development Kit

Zilog's MultiMotor Series Development Kit aids in the development of motor control applications using an assortment of Zilog MCUs aimed at the motor control environment. It provides an application-specific platform for creating a design using a Zilog motor control MCU. This development kit features a Zilog MCU Module connected to a 3-Phase MultiMotor Series Development Board, plus a 24V DC/3200 RPM 3-phase motor.



MultiMotor Development Kit

Highlights

The MultiMotor Series Development Kit supports:

- Sensorless block commutation
- Hall sensor block commutation
- Hall sensor sinusoidal PWM commutation
- Hall sensor space vector modulation commutation
- Several motor types, including BLDC, PMSM, and ACIM
- Control algorithms including sensored, sensorless, trapezoidal, sinusoidal, and space vector modulation

The MultiMotor Series Development Kit is easy to use, and contains everything you need to get started right out of the box.

Kit Contents

- Z16FMC MCU Module
- 3-Phase MultiMotor Series Development Board
- 24V/30W/3200RPM BLDC motor
- USB Opto-Isolated SmartCable (includes black box, six-conductor ribbon cable, and Type A-to-Type B USB cable)
- Opto-Isolated UART-to-USB adapter (includes adapter and Type A USB extension cable)
- 24 V AC/DC Universal Power Adapter

F6482 Series General-Purpose Flash Microcontroller

Zilog's F6482 Series MCUs, members of the Z8 Encore! XP family, are based on Zilog's advanced 8-bit eZ8 CPU core. This microcontroller is optimized for low-power and wireless applications, and supports 1.8V to 3.6V low-voltage operation with extremely low Active, Halt and Stop Mode currents, plus it offers an assortment of speed and low-power options. In addition, the feature-rich analog and digital peripherals of the F6482 Series makes it suitable for a variety of applications including safety and security, utility metering, digital power supervisory, hand-held electronic devices, and general motor control.

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

To learn more about the F6482 Series, or to download product collateral and software, visit www.zilog.com.

F6482 Series Family Part Selection Guide

Part Number	Flash (KB)	RAM (B)	LCD	NVDS (B)	I/O	ADC Inputs	SPI	I^2C	UARTs	USB	Packages
Z8F6482	64	3840	Yes	–	26–67	8–12	2	1	1–2	0–1	64- and 80-pin
Z8F6082	60	3840	Yes	128	26–67	8–12	2	1	1–2	0–1	64- and 80-pin
Z8F3282	32	3840	Yes	128	26–67	8–12	2	1	1–2	0–1	64- and 80-pin
Z8F1682	16	2048	Yes	128	26–67	8–12	2	1	1–2	0–1	64- and 80-pin
Z8F6481	64	3840	No	–	26–67	9–12	1–2	1	1–2	1	32-, 44- and 64-pin
Z8F6081	60	3840	No	128	26–67	9–12	1–2	1	1–2	1	32-, 44- and 64-pin
Z8F3281	32	3840	No	128	26–67	9–12	1–2	1	1–2	1	32-, 44- and 64-pin
Z8F1681	16	2048	No	128	26–67	9–12	1–2	1	1–2	1	32-, 44- and 64-pin

S3 Family of Microcontrollers

Zilog's S3 Family of Microcontrollers offers a fast and efficient processor core, Flash memory, a wide range of integrated peripherals, and an efficient register-oriented architecture designed to facilitate a multitude of consumer and home appliance applications.

The first table shows available devices targeted for low power applications such as IR remote controls; the second table lists available devices that are ideally suited for consumer and home appliance applications.

S3 Family Low Power Devices

Part Number		
S3F80P5	S3F80P9	S3F80PB
S3F80Q5	S3F80QB	

S3 Family Consumer/Appliance Devices

Part Number		
S3F82NB	S3F8S35	S3F8S8B
S3F84B8	S3F8S39	S3F94C4
S3F8S15	S3F8S45	S3F84I9*
S3F8S19	S3F8S5A	S3F828B*
S3F8S24	S3F8S6B	S3FC40D*
S3F8S28	S3F8S7B	S3F84NB*
Note: *Not recommended for new designs.		

The following table shows the devices that are no longer supported, along with their replacements.

Replacements for EOL Products

EOL Part	Replacement
S3F84K4, S3F9454	S3F94C4
S3F84A5, S3F84H5, S3F84Q5, S3F84T5, S3F80N8, S3F80L4, S3F94A5	S3F8S39
*S3F9488, S3F84I8, S3F94A5, S3F9228, S3F84U8	S3F8S45
*S3F84I9, S3F84UA	S3F8S5A
*S384VB, S3F8235, S3F8274, S3F8275, S3F8278, S3F84NB, S3F848A, S39234	S3F8S6B
*S384YB, S3C8245, S3F8285, S3F8289, S3F828B, S3F82I9, S3F84MB, S3P7335, S3P8245, S3P8249, S3P825A	S3F8S7B
*S3F84ZB, S3F82HB, S3F833B, S3P72P9, S3P72Q5	S3F8S8B

Note: Items marked with a * are pin-for-pin equivalent with their replacement devices. Some firmware modifications may be required. Contact your local Zilog Sales Representative.

For more information about our S3 Product Family, visit www.zilog.com/S3

World of Motors Reference Design

The World of Motors Development Board

The World of Motors (WoM) reference board is a development platform using Zilog's series of Mini-Z stamp modules. It is designed to provide engineers, students and enthusiasts a simple-to-use platform for developing motor control related prototypes and projects.

The WoM board is designed to work with Zilog's series of Mini-Z modules; however, it is also compatible with other vendor's basic stamp modules. This board includes an FTDI USB-to-serial converter for serial communication.

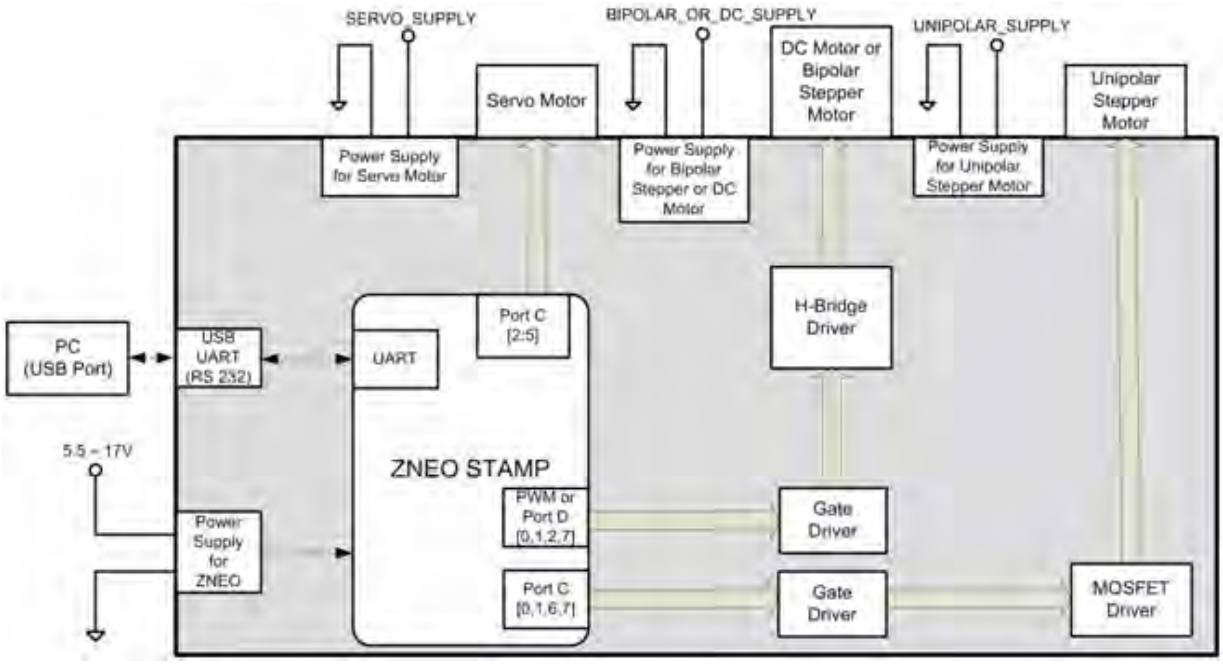
This reference design includes Shell and Standalone application codes. The Shell application is built upon existing ZNEO Mini-Z library to provide command line instructions to drive the motors. The standalone application is a terminal-based application that provides menu-driven commands to drive the motors.

Features

- Controls the following motors:
  - DC brush motor
  - Servo Motor
  - Unipolar Stepper Motor
  - Bipolar Stepper Motor
- Controls motors wirelessly by Mini-Z ZPAN or Mini-Z WLAN modules
- Provides console communication

Applications

- Robotics
- Security Locks
- Fans
- Navigation Systems
- Instrumentation
- Automated Sprinkler Systems



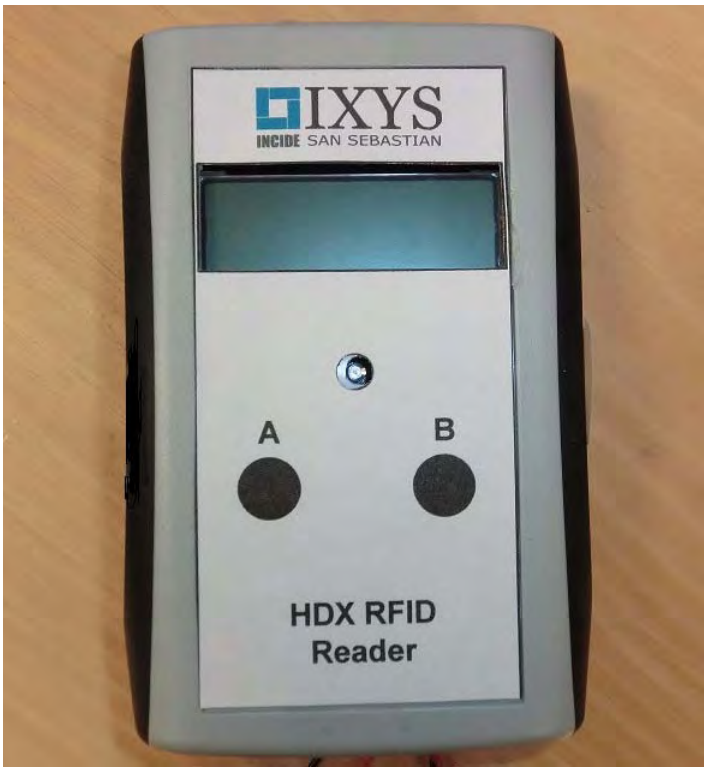
RFID Reader/Programmer Reference Design

The Radio Frequency Identification (RFID) Reader/Programmer reference design provides the ability to read and program RFID transponders (also referred to as tags). This reference design focuses on RFID Transponders NCD1015 and NCD1025 from IXYS San Sebastian, and is well suited to add other transponders.

Features

- Battery operated for in the field work or powered from the wall for more extensive operations.
- Ability to program RFID transponders
- Ability to read RFID transponders, including subpages
- Easy to use buttons to control reading with LCD display for the information on the RFID transponder.
- Ability to interface with the PC for more control and automation capabilities
- 1MB EEPROM storage to keep track of different transponders' ID and information

RFID transponders are used in a wide variety of industries. They are primarily utilized to automatically identify objects they are attached to. The RFID transponders may also have the capability of storing a small amount of information or have sensors, such as a temperature sensor, to provide useful information. One implementation of such a sensor is the NCD1025, which is a wireless temperature reading system for veterinary applications. Pets can be implanted with an RFID transponder that provides the information to allow for the return of a lost pet.



New in the Zilog Store

Opto-Isolated USB SmartCable

Opto-Isolated USB SmartCable

The Opto-Isolated USB 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.

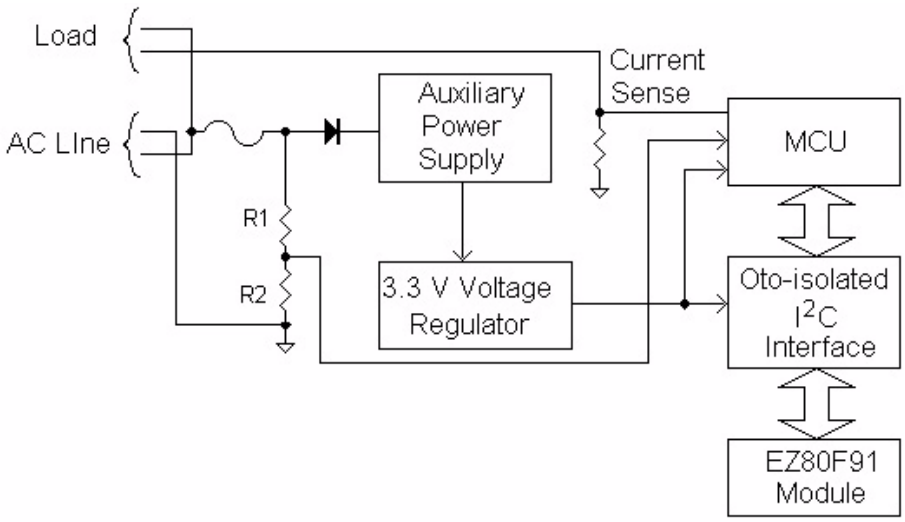
This USB SmartCable's internal optoisolator electrically isolates it from the circuitry of your Zilog development board, thereby preventing high input voltages from affecting the system receiving the output signal.

The Opto-Isolated USB SmartCable is available for purchase in the Zilog Store.

Z8F2480 Power Monitor with eZ80F91 Webserver

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 90V to 240V 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.



This reference design ships with the following items:

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

Tips and Tools

Tips from Professor Ken

Stuck on a design issue? Have a question about a Zilog product?

Professor Ken is here to help! Find solutions to frequently asked questions and learn some new tips and tricks!

Q How do I enable line numbers in the ZDS2 Edit Window and highlight the line that the Program Counter is at to a different color line in Debug Mode?

A From the menu bar, click **Tools → Options → Editor tab → Advanced Editor Options**. The Advanced Editor Options window will display. Select the Display Line Number Margin and Highlight PC line in Debug mode boxes. Click on the box to the right of PC line Background Color and select the desired color, then click the **OK** buttons to close the Color, Advanced Editor Options, and Options windows.

Q What should be the `BRG_H` and `BRG_L` settings for the eZ80F91 UART when running at 19,200 baud using 50 MHz crystal?

A The BRG setting for 19.2k baud should be set at `00A3h` instead of `00A2h` so that a resultant potential 28 baud error occurs instead of 90 baud error at `00A2h`.

Q On my Z8 Encore! MCU, I have set up a vectored interrupt from pin PC0, and confirmed this on a PC0 transition that sets the IRQ2 flag for PC0. However, once it's set, it never clears. Clearing the flag is the first thing that should happen when the program gets to the PC0 interrupt service routine. It seems the program never gets to this service routine. What am I missing?

A The Interrupt Request Enable (IRQE) bit is the global interrupt enable bit and must be set to a "1" state for interrupts to occur. The Enable Interrupt command (EI) must be executed to set the IRQE bit to "1". When using C-code, the EI() function must be used to set the IRQE bit and the DI() function must be used to reset the IRQE bit to a "0" state.

Q I want to use the Z8F6423 MCU with internal ADC V_{REF}. How do I set up the V_{REF} pin when using the Z8F642 Development Board?

A The Z8F642 Development Board is set up for the convenience of the customer who would use external V_{REF}. This was done so that a customer would not have issues trying to figure out which filters caps to use with External V_{REF}. If the customer wants to use Internal V_{REF}, they must remove the two filter caps on the development board to leave the V_{REF} pin unconnected, as specified in the product specification.

Q I am successful in using the S3 ISP & S3 ZDS2 to download & program the Flash of my S3F8S35 microcontroller in ZDS2 Debug Mode. However, when I use the S3 ISP & S3 ZDS2 Flash Loader Utility in the Tools Menu, why am I not able to program the Flash of my S3F8S35 MCU?

A The Debug Mode and the Flash Loader Utility both have their own separate Smart Option set-

tings control. When using the ISP, the LVR must be set at 2.3V or lower in the Smart Options settings. The LVR must be set in the Debug Mode Smart Options settings and when using the Flash Loader Utility in the Tools Menu, the Smart Option for LVR must also be set for 2.3V or lower. It is important to use all of the same Smart Option settings in Debug Mode as in the Flash Loader Smart Option settings; otherwise the MCU will not behave the same in Debug Mode as it would after using the Flash Loader to program the MCU's Flash.

Q How do I enable the multiple Edit window tabs feature in ZDS2?

A For multiple edit window tabs to appear, your IDE should be in Workbook Mode.

To enable Workbook Mode, right-click in the upper right part of ZDS, just above the Edit Window, and click **Workbook Mode**.

Tools Developments

ZDS II – Z8 Encore! version 5.2.1

The ZDS II – Z8 Encore! version 5.2.1 software is a maintenance release that includes the following updates:

- Fixed typographical error in names of ZMotion CPUs in the ez8.h and ez8dev.inc files
  - Modified USB configuration callback parameters to include the Configuration, Interface, and Alternate Setting specified in Set Configuration and Set Interface requests. For more information, refer to the description of the `fpUserConfig` member of the `BSP_USB` structure described in the Z8 Encore! XP F6482Series API Programmers Reference Manual (RM0064)
  - Fixed a bug in the RTL module `ulcase.asm` which could cause unpredictable program execution, depending on register usage in other parts of the application.
  - Fixed a bug in the `uscan_state.c` RTL module which could cause the compiler to give an incorrect error message for valid C code using the String Placement feature for a string stored in ROM.
  - Updated bit-field labels in BSP header files to match the latest Z8 Encore XP F6482 Series Product Specification (PS0294)
  - Modified BSP source code and sample projects to use updated bit-field labels

For additional information about this release, see the readme.txt file.

Tools and Software

Zilog tools provide a fully functional and flexible environment to enable you to easily design innovative applications. These tools enable engineers to fully evaluate the features of Zilog products. Whether in evaluation or preliminary development, the Zilog toolset allows flexibility and functionality in the development environment.

Browse the **Tools and Software** menu on zilog.com to learn more about Zilog's Development Tools and view a list of Third Party Tools. You can also find links here to our **Documentation** and **Application Sample Libraries**.

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.

Application Solutions

Zilog engineers develop application notes and reference designs that provide the technical information and functionality to support your designs.

Click **Application Solutions** or **Reference Designs** in the **Applications** menu at zilog.com to view or download these solutions.

Read on for a preview of our latest Application Notes.

An OCD ISP for the Z8 Encore! Family Using the Z8F6482 MCU Application Note(AN0373)

This application note describes a boot loader program that uses a Z8F6482 microcontroller to control an On-Chip Debugger (OCD) In-System Programmer (ISP) for debugging and programming the entire family of Z8 Encore! microcontrollers, which includes the Z8 Encore!, Z8 Encore! XP, and Z8 Encore! MC product lines.

Boot Loader for the Z51F6412 MCU Application Note (AN0377)

This application note discusses how to create a boot loader program for the Z51F6412 microcontroller, a member of Zilog's Z8051 Family of Microcontrollers. The boot loader is developed using the Keil µVision 4 IDE and provides the functionality to program an Intel Hex-format file to the Z51F6412 MCU's Flash memory through the UART.

Captain Zilog Comic Books

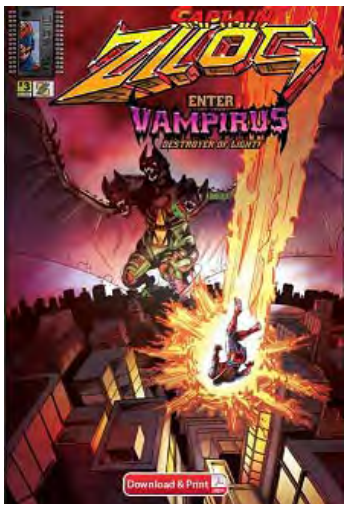
Catch all the action with three comic books featuring our favorite superhero, Captain Zilog as he battles evil forces and emerges victorious. Don't miss the amazing story line and original artwork! Click the comic cover page to read the digital version, or go to the Zilog store to buy the comic book.

Menace of the Motor Control Maggots

In this first adventure,Captain Zilog tackles the Motor Control Maggots. In addition to English, this edition is available in Chinese, Japanese, and Korean.

Attack of the Connectivity Constrictor

Captain Zilog fights off an attack of the Connectivity Constrictor in this action-packed second comic in the series. Enjoy it in English or Chinese.



Vampirus Goes Viral

In this thrilling encounter, Captain Zilog prevents Vampirus from going viral with the help of Zilog's low-power F6482 MCU.

Zilog Community

Zilog Forum

The Zilog Forum is an interactive site that offers a unique platform to interact with Zilog engineers, learn about new products, and ask questions or share your knowledge.

The Forum is organized into the following sub-forums:

General We encourage new members to post a short introduction in the general forum category. Get to know each other and share common interests.

In the Know The information here contains technical solutions to application designs. Zilog's Application Engineers share their knowledge so you can save time and get to the result you want faster.

The Wake Up Channel Here's your chance to tell us directly what is not working. We are listening!

Fun and New Ideas! Have you seen a video or read a story about someone using a Zilog product in a unique or fun way? Share it with us by posting here.

Emerging Energy Management Frontier Cool new ideas and thoughts on how Energy Management is evolving and ways to create clever solutions.

Development Tools Tips and Tricks A place to provide tips and tricks for the development tools.

You can also perform a search on Forum postings to see if your question has been previously addressed.

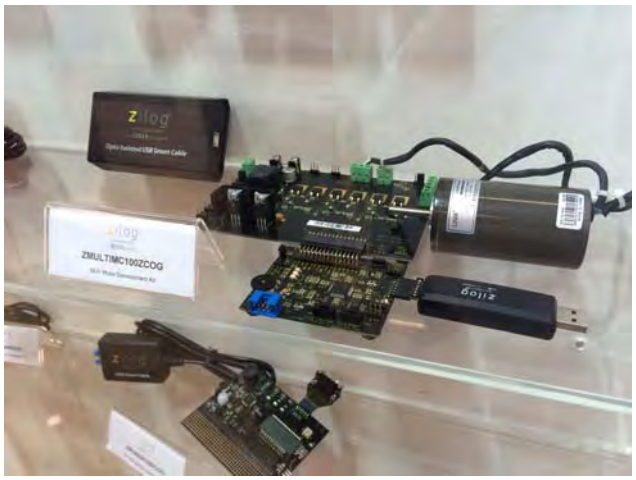
Register to be a member and join the conversation! We welcome your questions and comments.

To contact Zilog Customer Service or Technical Support, log in to zilog.com, click the **Create a Support Ticket** link in the left panel, and complete and submit the ticket.

Zilog News and Events

Embedded World, Feb 19-21

Simos, a Zilog distributor, participated in the Embedded World exhibition in Nuremberg, Germany, which included a display of Zilog-products. Embedded World is an international trade fair that focuses on embedded technologies.



PCIM Europe, May 19-21, 2015

IXYS will host a booth at PCIM Europe 2015 in Nuremberg, Germany. Power Conversion Intelligent Motion (PCIM) is a leading meeting point for specialists in power electronics and its applications in intelligent motion, renew able energy, and energy management.

Zilog products and solutions will be on display at the IXYS booth, and our engineers will be available to answer your questions. Be sure to visit IXYS booth number 305 in Hall 9 at PCIM Europe!

Archive

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

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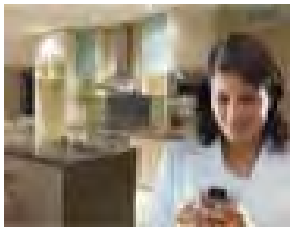

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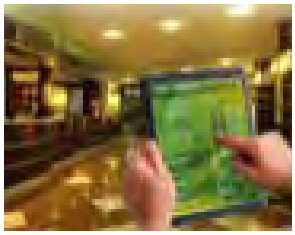

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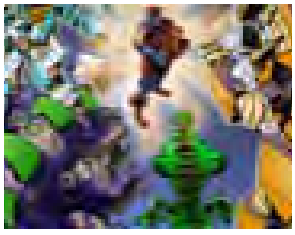

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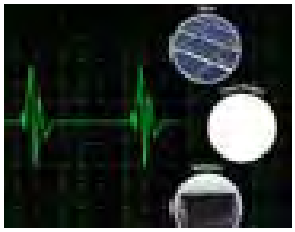

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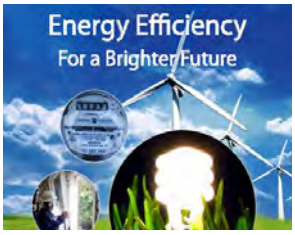

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