

**zilog** *Embedded in Life*

An IXYS Company

# The Channel

Zilog Technical News & Information

NOVEMBER 2013 • Issue 14

## Energy Efficiency For a Brighter Future



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Globally, energy efficiency has become a mantra for many industry segments. How to carry out these goals of creating more efficiency designs is where our focus often lands. There are many improvements being done in countless devices and applications with the specific purpose of creating better performance results using various types of energy more efficiently.

This is not a recent focus, but more of an evolution of design goals that impacts almost every usage segment that people come in contact with every day. There seems to be more concentration on industries that consume greater amounts of energy and power in which significant progress can be seen and measured. For instance, there are areas such as industrial, manufacturing, communication, particularly in data management, medical, building systems, and consumer markets.

Within these industries, large amounts of energy are consumed daily, thus, technical efficiencies can make a significant difference in reducing power consumption, and still meet or improve upon the expected performance results. As an example, a manufacturing plant may use motors, pumps and fans to manage the facility; more often than not, many of these units are running in various stages at the same

time. What type of process can be implemented to achieve noticeable results? You can determine which devices consume the highest amount of energy, and schedule when their tasks will be performed. Once that has been determined, you can leverage time slots when energy is under less demand or during hours when the rate is more advantageous. Another way to be diligent with energy efficiency would be to consistently check the wear and tear on your equipment, and to be vigilant with maintenance on all equipment. For example, over time, motors can greatly deteriorate without regular maintenance, which will cause the performance to no longer operate at peak efficiency; consequently, you'll need to feed it gas or oil (energy) more regularly, and ultimately may need to replace or rebuild it, so that you're not spending money unnecessarily.

Many industries are continuing to explore energy harvesting and renewable energy. You can't just build for it, you must optimize it to make the best use of the energy being collected, and store it in a way that will manage the energy for best efficiency. Another area being explored for energy efficiency is the smart grid, which represents the full suite of current and proposed responses to the challenges of electricity supply. Since the early 21st century, opportunities to take advantage of

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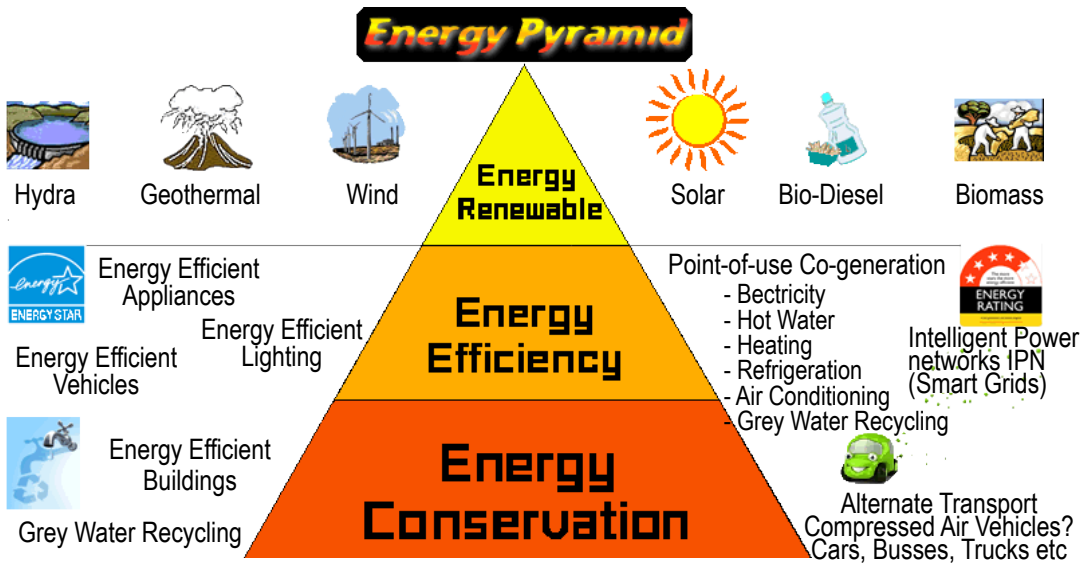
improvements in electronic communication technology to resolve the limitations and costs of the electrical grid have become apparent. It is one thing to collect and monitor results from the smart meter, but the smart grid allows the consumers to be more flexible and sophisticated in their operational strategies; therefore, consumers will be able to be more strategic when utilizing energy. Industrial equipment such as HVAC, water heaters, dryers, and other infrastructure systems can also become more intelligent on how the energy is cycled.

These are just a few perspectives on how an industry can look at the bigger picture when designing for energy efficiency, so the entire eco-system benefits from the new vision our industry is driving. By looking at the entire energy platform together, our area of focus can better intertwine with the many facets required to build a more interactive and optimized system. It not only helps industry growth, but helps create a greater future for those who want to reap the benefits of the dedication and work.



**Steve Darrough**

Vice President of Sales & Marketing Worldwide



## eZ80Acclaim!/eZ80AcclaimPlus! Ethernet Modules Features:

- Factory-default operating clock frequency at 50 MHz
- 10/100 Base-T Ethernet PHY with RJ45 connector
- 512 KB off-chip fast SRAM
- 8 MB off-chip NOR Flash memory
- 32 Mbit serial Flash memory with SPI interface
- Battery for on-chip Real-Time Clock
- Input/Output connector (J2) which provides 32 general-purpose 5 V-tolerant I/O pin-outs
- Onboard connector provides I/O bus for external peripheral connections (IRQ, CS, 24 address, 8 data)
- Low-cost connection to carrier board via two 2x30 pin headers
- Small footprint 63.5 mm x 78.7 mm
- 3.3 V power supply

*Continued on page 4*

## eZ80Acclaim!/eZ80AcclaimPlus! Ethernet Modules

Zilog's [eZ80Acclaim!/eZ80AcclaimPlus! Ethernet Modules](#) are compact, high-performance devices specially designed for the rapid development and deployment of embedded systems requiring control and internet/intranet connectivity.

These expandable modules are powered by Zilog's power-efficient, optimized-pipeline-architecture eZ80F91 MCU, a member of Zilog's [eZ80AcclaimPlus!](#) family. The eZ80F91 MCU is a high-speed, single-cycle instruction-fetch microcontroller that operates with a clock speed of 50 MHz. It can also operate in Z80-compatible addressing mode (64 KB) or full 24-bit addressing mode (16 MB).

The rich peripheral set of these eZ80Acclaim!/eZ80AcclaimPlus! Ethernet Modules make them suitable for a variety of applications, including industrial control, communication, security, automation, point-of-sale terminals, and embedded networking applications.

## Memory

The Module's onboard memory consists of the following components:

- U4, CY7C1049: 512 KB SRAM with a 10 ns access time
- U5, S29GL064N: 8 MB NOR Flash with 90 ns access time

*Continued on page 4*

*Continued from page 3*

- Standard operating temperature range: 0°C to +70°C

**Listed below are some of the eZ80Acclaim!/eZ80Acclaim Plus! MCU Features:**

- Single-cycle instruction fetch, high-performance, pipelined eZ80 CPU core
- 256 KB of Flash memory and 8 KB of SRAM
- 10/100 Mbps Ethernet MAC with 8 KB frame buffer
- Low power features including SLEEP Mode, HALT Mode, and selective peripheral power-down control
- Two UARTs with independent baud rate generators and support for 9-bit operation
- SPI with independent clock generator
- I<sup>2</sup>C with independent clock generator

*Continued on page 5*

- U3, S25FL032: 32 Mb NAND Flash with an SPI interface

The Module contains external Flash memory, and the eZ80F91 MCU contains internal Flash memory. To allow read/write access to Flash memory on the Module, there are two signals provided, on connectors J1 and J2. A jumper on the module, JP3, enables the programming of on-chip Flash. There is also a signal that duplicates the function of this JP3 jumper. The table below indicates the states of the signals and the status of the JP3 jumper for different modes.

**Flash Memory Programming Signals and Jumpers**

Signal/Jumper	Function	State/Status
DIS_FLASH	Controls read/write access to the eZ80Acclaim!/eZ80AcclaimPlus! Ethernet Module for external Flash memory	When Low, access is enabled
FLASHWE	Controls write operations to the boot block of the eZ80Acclaim!/eZ80AcclaimPlus! Ethernet Module for external Flash memory	When Low, write is enabled

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- Infrared data association (IrDA)-compliant infrared encoder/decoder
- Real-time clock with on-chip 32 kHz oscillator, selectable 50/60 Hz input, and separate  $V_{DD}$  pin for battery backup
- Four 16-bit Counter/Timers with prescalers and direct input/output drive
- 32 bits of general-purpose input/output (GPIO)
- 144-pin BGA or 144-pin LQFP package
- Supply voltage of 3.0 V to 3.6 V with 5 V-tolerant inputs
- Standard operating temperature range: 0 °C to +70 °C

Signal/Jumper	Function	State/Status
JP3	Controls write access to eZ80F91 MCU on-chip Flash memory	When IN, write is enabled
F91_WE	Controls write access to eZ80F91 MCU on-chip Flash memory	When Low, write is enabled

The external Flash memory space of the eZ80Acclaim!/eZ80Acclaim*Plus!* Ethernet Module has an access time of 90 ns. At least five wait states must be added to the cycle when accessing external Flash at 50 MHz clock speed. The eZ80F91 devices on-chip Flash is faster; its minimum access time is 60 ns, which requires only three wait states at 50 MHz.

The Modules feature 512 KB of fast SRAM. Access time is 10 ns, which requires one-wait-state access. The eZ80F91 MCU's on-chip SRAM is used with zero wait states. An additional memory component on the Module is NAND Flash memory with an SPI interface. This 32 Mb device is manufactured by Spansion.

The footprint of each Modules' PCB is 63.5 mm x 78.7 mm. With an RJ-45 Ethernet connector, the overall height is 25 mm.

These new Ethernet Modules are an upgraded version:

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Continued from page 5  
**Product Spotlight**

Current Version	Upgraded Version
eZ80F915050MODG	eZ80F915150MODG
eZ80F917050SBCG	eZ80F917150MODG

Zilog will have samples of the upgraded version available upon request. In addition, a limited quantity of the current version is available for last time purchase.

**Changes/Upgrades from the current modules to the replacement modules**

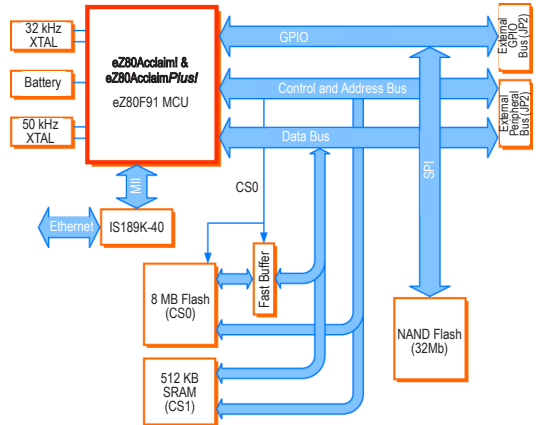
- Off-chip NOR Flash memory increased from 1MB to 8MB
- **NEW** 4 MB SPI Flash memory
- Battery-backed Real-Time Clock increased from 7mAh to 45mAh
- Zilog ZHX1810 IrDA transceiver no longer available on the new modules
- The eZ80 package has been changed from a 144-pin LQFP to a 144-pin LPGA

**Other features of the upgraded modules:**

- Compatible with all existing applications
- Identical dimensions and connections to current modules (same form/ fit/ function)

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**Ordering Information**

To place an order, please contact a Zilog authorized distributor using the following part numbers. The [Zilog website](#) lists all regional offices and provides additional information.

Current Version	Upgraded Version
<a href="#">eZ80F915150MODG</a>	eZ80Acclaim! Ethernet Module
<a href="#">eZ80F917150MODG</a>	eZ80AcclaimPlus! Ethernet Module
eZ80F910300KITG	eZ80AcclaimPlus! Development Kit



## ZMOTION AC Load Controller Features:

- Controls power to an AC load based on motion detection
- ZMOTION PIR Technology provides immunity to EMI/RFI and other false trigger sources
- 120 VAC/240 VAC 60 Hz/ 50 Hz input/output
- Switched AC line output for loads up to 5 A (limited by fuse and relay)
- Adjustable sensitivity, delay, and ambient light gate level
- Smart Delay feature for *pass-through* events
- Delayed Detection Mode for harsh conditions
- Small two-layer single-board design, with a 2.7" x 1.7" (6.5cm x 4.3cm) foot print

**NOTE:** Both Smart Delay and Delayed Detection can be enabled/disabled and configured in the source code.

Zilog's [ZMOTION AC Load Controller](#) reference design demonstrates how to use Zilog's ZMOTION MCU in a passive infrared-based motion detector to control power to an AC load in applications such as lighting and HVAC systems. The design uses the Z8FS040 8-pin ZMOTION MCU to intelligently control a mechanical relay, and provides user adjustments for motion sensitivity, delay time, and ambient light level.



Click to enlarge

The ZMOTION AC Load Controller reference design consists of a single PCB that connects directly to the AC line and controls power to an AC load via a relay. The Z8FS040 ZMOTION MCU provides motion detection, user interface, and output control functions. A low-cost capacitor-dropper power supply is used to provide power to the MCU and relay, but other power supply topologies, including switching and transformer types, are also possible. The ZMOTION MCU provides all timing and control functions in addition to motion detection.

With the continued increase in automated lighting and related applications, the need for a more intelligent, low-cost control system has

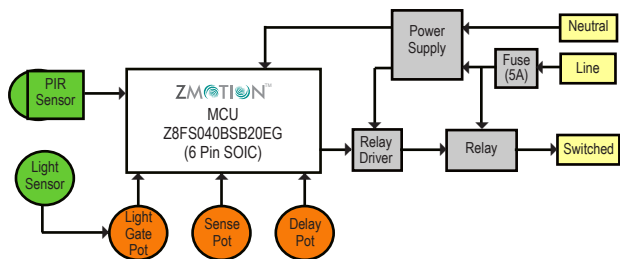
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The ZMOTION AC Load Controller reference design can be used to develop a number of applications; the brief list below offers a few ideas.

- Occupancy-based lighting control
- Doorway/hallway lighting control
- Closets and other small rooms
- Office cubicle lighting and power control
- Kiosk power control
- Retail displays
- Entrance and exit control
- Appliance power management
- HVAC Control

become apparent. ZMOTION provides this capability.

The Z8FS040 ZMOTION MCU is a fully programmable microcontroller with built-in software-based motion detection algorithms to simplify the development of PIR motion detection designs. It is based on the Z8F082A MCU, a member of Zilog's Z8 Encore! XP family of Flash microcontrollers.



Click to enlarge

The following lenses are available from Zilog and have been tested with this reference design. Other lenses such as the Fresnel Technologies XX 0.25 GI VX series are also supported.

Part Number	Description	Typical Applications
ZNCL-9(26)	<b>15 mm Ceiling/Wall Array (360°)</b> <ul style="list-style-type: none"> <li>• Clips on to pyroelectric sensor</li> <li>• 2.25 m radius at 2 m height</li> <li>• 2:1 diameter-to-height coverage ratio</li> </ul>	<b>Room occupancy and proximity sensing</b> <ul style="list-style-type: none"> <li>• Lighting control</li> <li>• Appliance</li> <li>• Office cubical</li> </ul>

Part Number	Description	Typical Applications
		<ul style="list-style-type: none"> <li>• HVAC Control</li> <li>• Kiosk/display control</li> <li>• Vending power management</li> </ul>
ZNCL-10IL	<b>10 mm Wall Mount Array (70°)</b> <ul style="list-style-type: none"> <li>• Clips on to pyroelectric sensor</li> <li>• 6 beams (X); 2 beams (Y)</li> <li>• 10 meter range</li> </ul>	<b>Proximity sensing or entrance detection</b> <ul style="list-style-type: none"> <li>• Kiosk/Display Counters</li> <li>• Vending</li> <li>• HVAC</li> <li>• Entrance/Access Control</li> </ul>
ZNCL-3B	<b>10 mm Wall Mount Array (40°)</b> <ul style="list-style-type: none"> <li>• Clips on to pyroelectric sensor</li> <li>• 4 beams (X); 2 beams (Y)</li> <li>• 10 meter range</li> </ul>	<b>Proximity sensing or entrance detection</b> <ul style="list-style-type: none"> <li>• Kiosk/Display Counters</li> <li>• Vending</li> <li>• HVAC</li> <li>• Entrance/Access Control</li> </ul>
ZNCL-3R	<b>10 mm Wall Mount Array (360°)</b> <ul style="list-style-type: none"> <li>• Clips on to pyroelectric sensor</li> <li>• 2:1 diameter-to-height coverage ratio</li> <li>• 14 zones</li> <li>• 5 meter range</li> </ul>	<b>Room occupancy and proximity sensing</b> <ul style="list-style-type: none"> <li>• Lighting Control</li> <li>• HVAC Control</li> <li>• Appliances</li> <li>• Kiosk/display control</li> <li>• Vending power management</li> </ul>
ZNCL-10S	<b>10 mm Wall Mount Array (17°)</b> <ul style="list-style-type: none"> <li>• Clips on to pyroelectric sensor</li> <li>• 2 beams (X); 1 beams (Y)</li> <li>• 10 meter range</li> </ul>	<b>Proximity sensing or entrance detection</b> <ul style="list-style-type: none"> <li>• Kiosk/display counters</li> <li>• Vending</li> <li>• HVAC</li> <li>• Entrance/access control</li> </ul>
ZNCL-11	<b>23 mm x 11 mm Wall Mount Array (104°)</b> <ul style="list-style-type: none"> <li>• Mounts on circuit board – black rectangular lens</li> </ul>	<b>Room and occupancy sensing</b> <ul style="list-style-type: none"> <li>• Kiosk/display counters</li> <li>• Appliance power management</li> </ul>

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Part Number	Description	Typical Applications
	<ul style="list-style-type: none"> <li>• 32 zones</li> <li>• 4 meter range</li> </ul>	<ul style="list-style-type: none"> <li>• Vending</li> <li>• TV auto shut-off</li> <li>• Office cubical</li> <li>• Keypad motion detector</li> </ul>



The ZMOTION AC Load Controller is available as an individual module and as part of a kit, which is shown in this image.

The ZMOTION AC Load Controller Reference Design Kit contains the following items:

Click to enlarge

- ZMOTION AC Load Controller Module with ZNCL-3R lens
- USB SmartCable
- Additional lenses: ZNCL-9(26), NCL-10IL, ZNCL-3B, NCL-10S, ZNCL-11
- ZMOTION AC Load Controller Kit Insert Flyer

### Ordering Information

Both products can be ordered from the [Zilog Store](#) using the part numbers listed in the following table. When ordered as an individual module, the ZMOTION AC Load Controller ships with the ZNCL-3R lens installed.

Part Number	Description	Store Product ID
ZMOTIONAC00ZRDG	ZMOTION AC Load Controller Reference Design Module	RD10027

Part Number	Description	Store Product ID
ZMOTIONAC00KITG	ZMOTION AC Load Controller Reference Design Kit	RD10028

For more information, to purchase, or to obtain documentation for this reference design, please visit [www.zilog.com/Store](http://www.zilog.com/Store).

### Current-Sensing Power Switch SCR with ZAURA Control Features:

- 90V–240V AC RMS input voltage range
- Up to 3 A load current
- Over current protection
- Weak current protection
- Less than 2 mA standby current at 120 V AC in OFF state
- 868 MHz Wireless Module Operating Frequency

### The following list offers a few ideas on application development:

- Remote operated commercial or architectural lighting
- Private lighting with remote control convenience features
- Remote operated household or industrial equipment

Zilog's [Current-Sensing Power Switch SCR with ZAURA Control](#) reference design integrates Zilog's ZAURA RF 868 MHz Wireless Module onto a Current-Sensing Power Switch SCR designed to showcase the features and performance of an AC switch based on an optically-isolated switch (CPC1966) which utilizes dual-power SCR outputs, with an AC voltage/current zero-crossing detection to minimize surge currents and sine wave distortions. This reference design can be used as a basis for developing systems that can control different power installations.

On its own, without the ZAURA RF Wireless 868 MHz Module attached, this design's Base Power Board functions as a development board to provide current to power the Module and the switch. However, the Base Power Board cannot control the load, because the source of the pulses required to perform this operation is generated by the Z8F2480 MCU on the RF Module. The Base Power Board, with the Module attached and controlled by a hand-held remote control device, enables RF communication to turn a load on and off.

Continued on page 12



[Click to enlarge](#)

To demonstrate RF control, a hand-held ZAURA RF Remote Control device is also included with this reference design.

The Current-Sensing Power Switch SCR Reference Design is simply comprised of the Base Power Board with Zilog's ZAURA RF Wireless 868 MHz

Module affixed to it (the Module is placed on the left side of the board, inside its housing). The Base Power Board is a two-layer surface-mount board that provides easy probe access points to all of the Current-Sensing Power Switch SCR inputs and outputs, thereby allowing the user to quickly connect and measure electrical characteristics and waveforms. The ZAURA 868 MHz RF Wireless Module is a four-layer board featuring an MCU, an RF transceiver, an antenna, and passive components.



[Click to enlarge](#)

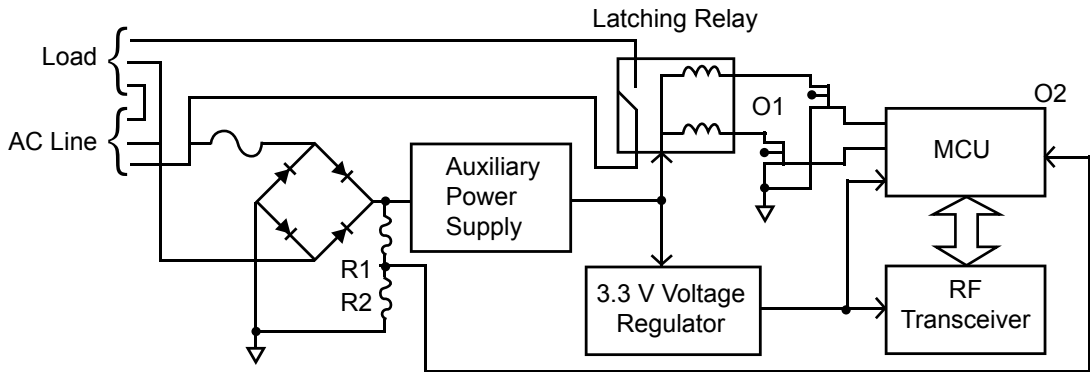


[Click to enlarge](#)

The Base Power Board and attached ZAURA Module are powered from a single-phase AC line with a 90–240 V voltage range. The Base Power Board provides up to 3 A load current at 240 V AC RMS.

The dimensions of the Base Power Board are 2.85" (L) x 1.85" (W) x 0.7" (H).

A block diagram of the Board is shown below.



Current-Sensing Power Switch SCR with ZAURA Control Reference Design Block Diagram

## Electrical Operating Characteristics

Name	Conditions	Min	Typ	Max	Units
Base Power Board Load Current	240 V RMS			3	A
Standby Mode input current (switch is off)	120 V RMS		2		mA
Overcurrent protection threshold	8 consecutive half waves			4	A
Minimum load current			25		mA
RF remote control device operating frequency			866.2		MHz
RF remote control device operating distance			30		m


## Ordering Information

The products associated with this Current-Sensing Power Switch SCR with ZAURA Control Reference Design can be ordered from the [Zilog Store](#) using the part number listed on next page.

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Part Number	Description	Store Product ID
ZRD0020F868ZRD	Current-Sensing Power Switch SCR with ZAURA Control Reference Design	RD10033

For more information, to purchase, or to obtain documentation for this reference design, please visit [www.zilog.com/Store](http://www.zilog.com/Store).

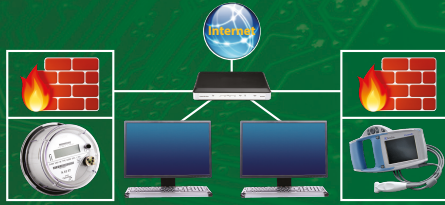


## Block Unauthorized Access at the Device Level with Zilog's ZGATE™ Embedded Security

Zilog introduces ZGATE™ Embedded Security, which combines multiple world-class technologies for safer, faster and better deployment of your embedded communication applications. Incorporating the eZ80F91 MCU and Zilog's full-featured TCP/IP stack with a world-class embedded firewall produces technology that provides the tools to design, build and bring your communication product to market.

**ZGATE Firewall Features**


- Ethernet, IP/UDP/TCP/ICMP filtering
- Extremely low latency; tests show improved network throughput under load by blocking packets earlier
- API for event logging
- Easily-configurable filtering rules:
  - Static/rules-based filtering blocks packets based on configurable rules
  - Dynamic filtering/stateful packet inspection (SPI) blocks packets based on connection state
  - Choose your firewall package based on application requirements – see table below



Firewall Features	Firewall Package		
	Standard	Extended	Premium*
Static filtering	Yes	Yes	Yes
Stateful packet inspection	Yes	Yes	Yes
Port, protocol and address limits	15 ports, 10 protocols, 10 IP addresses & 10 MAC addresses	100 ports, 100 protocols, 100 IP addresses & 100 MAC addresses	100 ports, 100 protocols, 100 IP addresses & 100 MAC addresses
Threshold-based filtering	No	No	Yes

\*The ZGATE Embedded Security Development Kit (ZGATE000100ZCOG) ships with the Premium firewall package.


Part Number	Firewall Package	Flash	SRAM	Temperature	Package
EZ80F91GAZ0AEG	Premium	256 KB	16KB	-40°C to 105°C	144-pin LQFP
EZ80F91GAZ0BEG	Extended	256 KB	16KB	-40°C to 105°C	144-pin LQFP
EZ80F91GAZ0CEG	Standard	256 KB	16KB	-40°C to 105°C	144-pin LQFP
ZGATE000100ZCOG	ZGATE Embedded Security Development Kit				




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For more information, please visit [www.zilog.com/ZGATE](http://www.zilog.com/ZGATE).







# S3 Family of Microcontrollers

## S3 Family Features:

- SAM8 & SAM88 Z8-Compatible CPU Cores
  - Flash Memory: 4, 8, 16, and 32 KB
  - RAM: 208, 272, 1040, 2086 bytes
  - CISC Instructions: 41, 78
  - Interrupts: 4, 17, 26
- And many more!

## Development Tools

A complete line of development tools are available for Zilog's S3 Family of Microcontrollers. The development environment is composed of your application board, a target board, an emulator, and a host PC running the IDE. Production programmers are also available from third party sources. Zilog's in-circuit emulator solution provides a wide range of capabilities and prices to suite most budgets and system complexities.

## Operating Characteristics

- Operating Voltage Range
  - 1.8V to 5.5V at 0.4–2 MHz

Zilog's **S3 Family** CPU features an efficient register oriented architecture and a sophisticated interrupt controller that allow for fast context switching. Flash memory is CPU-programmable and offers a 128-byte sector size.

## S3F84B8 MCU

The S3F84B8 MCU offers a fast and efficient Z8-compatible CPU, and 8KB of Flash memory.

Advantages	Applications
10-bit PWM specialized for Induction Heating Cooker applications	Induction Heating Cookers  Small Kitchen/ Home Appliances: <ul style="list-style-type: none"><li>• Boilers</li><li>• Rice Cookers</li><li>• Pressure Cookers</li></ul>
4 Comparators and integrated op amp reduces BOM and PCB area	
10 bit ADC for temperature, current or voltage measurement	
Small Flash sector size allows Flash to be used as EEPROM	
Programmable Low Voltage Reset ensure stable system operation	
Small package size minimizes PCB footprint	

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- 2.0V to 5.5V at 0.4–4 MHz
- 2.7V to 5.5V at 0.4–10 MHz
- Operating Temperature Range: –40°C to 85°C

### S3F8S19 and S3F8S15 MCUs are 48-pin members

The S3F8S19 and S3F8S15 MCUs offer a fast and efficient Z8 compatible CPU with 32KB or 16KB of Flash memory.

Advantages	Applications
Multiple 16 PWM timers with pulse and carrier generation	Vending Machines
2 UARTs, SPI and I <sup>2</sup> C to cover all serial communication requirements	IR Remote Controls with LCD
LCD controller for low-power display capabilities	Home Appliances: <ul style="list-style-type: none"> <li>• Induction Heaters</li> <li>• Air Conditioners</li> <li>• Washing Machines</li> <li>• Dryer Controller</li> <li>• Oven Controller</li> </ul>
10 bit ADC for temperature, current or voltage measurement	
Small Flash sector size allows Flash to be used as EEPROM	
Programmable Low Voltage Reset ensure stable system operation	

### Operating Characteristics

- Operating Voltage Range
  - 1.8V to 5.5V up to 4 MHz (LVR disabled)
  - 2.7V to 5.5V up to 12 MHz
- Operating Temperature Range: –40°C to 85°C

## S3F8S28 and S3F8S24 MCUs

The S3F8S28 and S3F8S24 MCUs offer a fast and efficient Z8-compatible CPU with 8KB or 4KB of Flash memory.

Advantages	Applications
Two 14-bit PWM Timers	Fan Control
12-bit SAR ADC with 20 $\mu$ s Conversion Time	Smoke Detectors
Full Duplex UART and Master/Slave I <sup>2</sup> C for External Communications and System Expansion	Rice Cookers
Small Flash Sector Size Allows Flash to be used as EEPROM	Cordless Tools & Battery Chargers
Programmable Low Voltage Reset Ensures Stable System Operation	PIR Motion Detectors Ambient Light Sensors Humidity Detectors LED Lighting Control System Board Management

## Operating Characteristics

- Operating Voltage Range
  - 1.8V to 5.5V up to 4 MHz (LVR disabled)
  - 2.7V to 5.5V up to 12 MHz
- Operating Temperature Range: -40°C to 85°C

## S3F8S35 and S3F8S39 MCUs are 32 pin members

The S3F8S35 and S3F8S39 MCUs offer a fast and efficient Z8 compatible CPU with 16KB or 32KB of Flash memory.

Advantages	Applications
Multiple 16 PWM timers with pulse and carrier generation	Vending Machines

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Advantages	Applications
2 UART's, SPI and I <sup>2</sup> C to cover all serial communication needs	IR Remote Controls
10 bit ADC for temperature, current or voltage measurement	Home Appliances: <ul style="list-style-type: none"> <li>• Induction Heaters</li> <li>• Air Conditioners</li> <li>• Washing Machines</li> <li>• Dryer Controllers</li> <li>• Oven Controllers</li> </ul>
Small Flash sector size allows Flash to be used as EEPROM	
Programmable Low Voltage Reset ensure stable system operation	

## Operating Characteristics

- Main Clock Frequency
  - 0.4 MHz to 12 MHz
  - External RC for main clock
  - Internal RC: 0.5 MHz , 1 MHz, 4 MHz and 8 MHz, all typical
  - On-chip free-running ring oscillator with 32 kHz frequency for 16-bit Timer 1
- Operating Voltage Range
  - 1.8V to 5.5V up to 4 MHz (LVR disabled)
  - 2.7V to 5.5V up to 12 MHz
- Operating Temperature Range: -40°C to 85°C

## S3F94C8 and S3F94C4 MCUs are 16- and 20-pin members

The S3F94C8 and S3F94C4 MCUs offer a fast and efficient Z8-compatible CPU with 4KB or 8KB of Flash memory.

Advantages	Applications
14-bit PWM to control heater power or motor speed	Induction Heaters

Advantages	Applications
10-bit ADC for temperature, current, or voltage measurement	Air Conditioners
Small Flash sector size allows Flash to be used as EEPROM	Small Kitchen/Home Appliances: <ul style="list-style-type: none"> <li>• Boilers</li> <li>• Microwave Ovens</li> <li>• Rice Cookers</li> <li>• Pressure Cookers</li> <li>• Vacuum Cleaners</li> </ul>
Programmable Low Voltage Reset ensures stable system operation	
Small package size minimizes PCB footprint	

## Operating Characteristics

- Oscillation Frequency
  - 0.4 MHz to 10 MHz external crystal oscillator
  - Typical 4 MHz external RC oscillator
  - Internal RC: 0.5 MHz, 3.2 MHz , both typical, in VDD = 5V
- Operating Voltage Range
  - 1.8V to 5.5V at 0.4–4 MHz (LVR disable)
  - LVR to 5.5V at 0.4–4 MHz (LVR enable)
  - 2.7V to 5.5V at 0.4–10 MHz
- Operating Temperature Range: –40°C to 85°C

## S3F82NB is a 128-pin member

The S3F82NB offers a fast and efficient Z8-compatible CPU with 64KB of Flash memory.

Advantages	Applications
16/80 LCD controller for controlling large displays	Vending Machines
10-bit ADC for temperature, current, or voltage measurement	Security Panels

Continued on page 20

Advantages	Applications
Small Flash sector size allows Flash to be used as EEPROM	Thermostats Home Automation User Interface Washing Machines Dryer Controller Oven Controller

### Operating Characteristics

- Operating Voltage Range
  - 1.8V to 5.5V up to 4 MHz (LVR disable)
  - 2.7V to 5.5V up to 12 MHz
- Operating Temperature Range: -40°C to 85°C

You can order your S3 Family parts from your local Zilog distributor. For more information, or to download product collateral and software, please visit us at [www.zilog.com/S3](http://www.zilog.com/S3).



For technical assistance with this or any of Zilog's S3 Family of products, log in to Zilog's [Technical Support interface](#) to create a support ticket, and select *S3 Family* from the Product Line menu.

For sales inquiries, please contact a Zilog [S3 Family sales representative](#).

Third Party Tools for Zilog's S3 Family of products are listed on our [Third Party Tools page](#).

# Zilog's Z8051 Product Family



## Advantages:

- High-Performance, Low-Cost Architecture
- Industry-Standard 8051-Compatible Core
- Industry-Wide Popularity
- Numerous Third-Party Tools Available
- Zilog's Continuing Commitment to Supporting Our Customers

## Meet the members of Zilog's Z8051 Product Family:

Z51F0410HCX	4KB Flash, 256 bytes RAM, 10 pin SSOP, LF
Z51F0811RFX	8KB Flash, 512 bytes RAM, 16-pin TSSOP, LF
Z51F3220SKX	LCD, 32KB Flash, 1K bytes RAM, 32-pin SOP, LF
Z51F3221ARX	LCD, 32KB Flash, 1.25K bytes RAM, 64-pin LQFP, LF
Z51F6412ARX	64KB Flash, 3.25K bytes RAM, 64-pin LQFP, LF
Z51F6412ATX	64KB Flash, 3.25K bytes RAM, 80-pin LQFP, LF

These powerful microcontrollers provide a highly flexible and cost-effective solution to many embedded control applications, including:

- Electronic Locks
- Battery Management
- Motor Control
- Keyless Entry Systems
- LED Lighting Control
- Digital Clocks/Watches

And much more ... your design possibilities are endless!

For more information about our Z8051 Product Family, please visit [www.zilog.com](http://www.zilog.com).



### Microstepper Motor 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

### Potential 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

*Continued on page 23*

### NEW Microstepper Motor now available!

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 multi-channel timer as a microstepper sine/cosine current generator.



[Click to enlarge](#)

The Microstepper Motor Reference Design is available as an individual board and as part of the Microstepper Motor Reference Design Kit, which includes the Microstepper Motor Design Board and power adapter.



Continued from page 22

- Goniometers
- Mirror mounts
- Packaging machinery
- CD/DVD disk drives
- Flatbed/image scanners
- Computer printers
- Plotters
- Slot machines
- Intelligent lighting
- Retrieval or exploration/drilling machinery



Click to enlarge

This reference design is now available for purchase from our [Zilog Store](#). For more information, or should you have any questions about this reference design, please visit [www.zilog.com](http://www.zilog.com).

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**25% off**

**BIG SALE**

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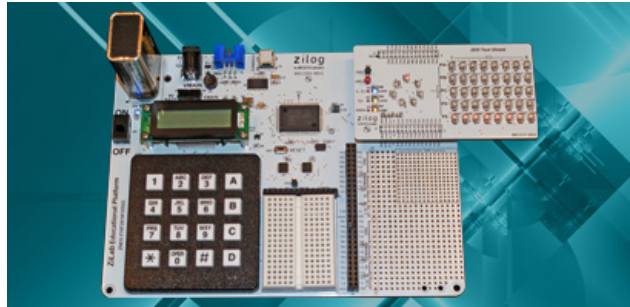
**SHOP NOW**

Use coupon code 'unlock25'

Offer expires December 20, 2013

### Educational Platform Features:

- Input via a 16-key pad and/or a PC console application
- Output through a 16x2 LCD and/or standard PC monitor
- Dual-format breadboards, both standard and solderless
- Dual main power options: 6V–12V wall outlet or 9V battery for mobile operation
- Three voltages available to the breadboard when the Platform is powered with the included 9V wall outlet:
  - $V_{\text{MAIN}}$
  - 3.3V
  - 5V with a maximum current of 2.0 amps
- 47 GPIO lines
- Stackable application shield modules
- Preprogrammed command shell
- I/O signal access connector
- Buzzer



Click to enlarge

Here at Zilog we recognize that the education of the next generation plays a critical part in the future of technology, which is why Zilog has committed to extending the impact of our efforts to education. This is an educational program that will provide our next generation with the building blocks critical to the success of the technology that's yet to come. A technologically strong workforce depends on their success.

The [Zilog Educational Platform](#) is the crown jewel of our NEW return to school program. It is designed to offer students a comprehensive education in engineering, computer, and electronics fields. The board comes with a preprogrammed Command Shell that allows control of the board without the need for any programming.

## Electrical Specifications for the Educational Platform

Parameter	Min	Max	Units	Notes
$V_{IN}$ Range	6	12	Volts	
Max voltage range on all other pins	-0.3	5.5	Volts	I/O pins and Reset; ADC pins are not 5V-tolerable
Max current for I/O pin connection points	-25	25	Milliamps (mA)	
Max $V_{IN}$ current	-	1	Amperes	
Ambient temperature	-40	105	°C	
Storage temperature	-65	150	°C	

### Modes of Operation:

- Serial Interface Mode
- Program/Debug Mode
- Independent/Mobile Mode

Based on the ZNEO 16-bit flash Z16F2810 MCU, the platform offers several stackable application shields for wireless communication, industrial sensing and lighting, motor control, and much more. These Zilog ZED Shields are stackable modules that work together in the same real estate, thus providing time and cost savings.

Currently there are four shields available with supporting software.

ZED Shield	Description
ZED Test Shield	This shield will test all 47 I/O lines, as well as offer limited binary study
<b>Note: The ZED Test Shield is only a testing tool and not stackable</b>	

Continued on page 26

ZED Shield	Description
ZED WLAN Shield for WiFi Communication	This shield uses Roving Networks RN-171 Module which conforms to the 802.11 b/g standard
ZED ZPAN Shield for Class 1 Bluetooth communication	This shield uses Roving Networks RN-41 Module which conforms to the 802.15 standard
ZED World of Sensors Shield	The World of Sensors Educational Platform Shield offers 7 distinct sensor technologies in a compact circuit board; sensors included are: <ol style="list-style-type: none"><li>1. Humidity</li><li>2. Proximity</li><li>3. Temperature</li><li>4. Motion</li><li>5. Ambient Light</li><li>6. Sound</li><li>7. Pressure</li></ol>

We are pleased to announce that we are currently working on an Educational Platform iOS App! The iOS app works in conjunction with the Educational Platform to accomplish the following tasks:

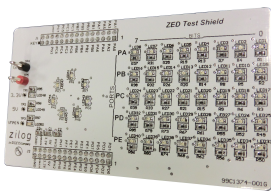
- Collects information from the Educational Platform, sensor shields, and peripherals, which display to the iOS user
- Communicates user supplied settings to the Educational Platform for shields and alarm limits
- Receives alarm signals from the Educational Platform and alerts the iOS user appropriately

We currently have a textbook available for purchase to help get you started on your designs. The title of this textbook is “[Programming the Zilog ZNEO Microcontroller by Example: Volume 1 - Getting Started](#),” and you can find it on Amazon.com for the low price of \$3.00.

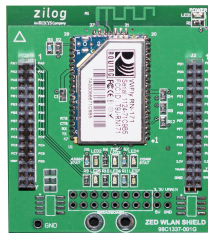
The Zilog Educational Platform provides a way for students to get started on a path to academic enrichment, and we have designed it with the student and teacher in mind. For more information about the Zilog Educational Program, or to purchase the platform, kit or shields, please visit [www.zilog.com/Store](http://www.zilog.com/Store).

### Zilog Educational Platform Ordering Information

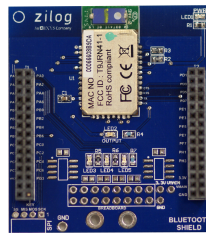
Description	Part Number	Store Product ID
Zilog Educational Platform	EZEDU16F100MDSG	ED10001
Zilog Educational Platform Kit	EZEDU16F100KITG	ED10002
ZED Test Shield	EZEDUTS0100ZACG	ED10006
ZED WLAN Shield	EZEDUWL0100ZACG	ED10005
ZED Z-PAN Shield	EZEDUZP0100ZACG	ED10004
ZED World of Sensors Shield	EZEDUWS0100ZACG	ED10003



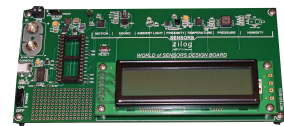
ZED Test Shield



ZED WLAN Shield



ZED Z-PAN Shield



ZED World of Sensors Shield

# Tools and Tips

## The Channel

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We are excited to announce that Zilog is now included in the IXYS EEWeb Tech Community Program. This is an IXYS branded tech community platform that publishes press releases, product briefs, applications notes, reference designs, and featured articles. EEWeb also offers schematic tools, and an 'Electrical Engineering Toolbox' of sorts.

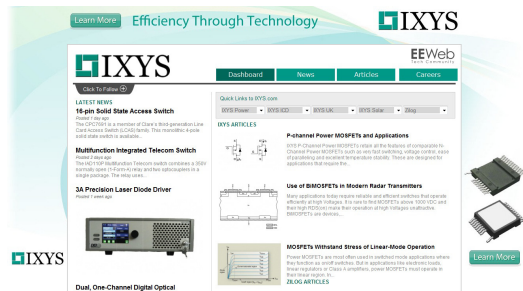
The page welcomes visitors with featured content focused on our mission to provide our customers with the most accurate product information and shares the knowledge and expertise in our field.

## Zilog 2013 Product Line Card



Click to browse

Please visit the website at [IXYS EEWeb Tech Community](#) to explore our IXYS EEWeb Tech Community, and all the tools available for your design needs.



Click to enlarge

Browse through our [Zilog 2013 Product Line Card](#) to learn more about the many products Zilog has to offer.

## Tips

### 1. Question:

The RET and the RETI instructions for the Z80/eZ80 families looks the same so what is the difference?

### Answer:

The RETI is required at the conclusion of a maskable interrupt. The reason for the RETI instruction is so that peripherals, which are *daisy-chained* or *nested* using the IEI and IEO control pins, could immediately decode the data bus and release their IEO output line, so that the next lower priority interrupt peripheral can initiate or continue servicing an interrupt.

Keeping the op codes different allows peripheral to distinguish between normal RET and Interrupt RET.

Excerpt from the Z80 CPU User Manual:  
“Two special return instructions are included in the Z80 family of components. The *return from interrupt instruction* (RETI) and the *return from non-maskable interrupt* (RETN) are treated in the CPU as an unconditional return identical to the (RET). The difference is that (RETI) can be used at the end of an interrupt routine, and all Z80 peripheral chips recognize the execution of this



Continued on page 30

## Tools & Tips

instruction for proper control of nested priority interrupt handling. This instruction, coupled with the Z80 peripheral devices implementation, simplifies the normal return from nested interrupt. Without this feature, the following software sequence is necessary to inform the interrupting device that the interrupt routine is completed:

Disable Interrupt	Prevent interrupt before routine is exited.
LD A, n	Notify peripheral that service routine is complete.
OUT n, A	
Enable Interrupt	
Return	

This seven byte sequence can be replaced with the one byte EI instruction and the two byte RETI instruction in the Z80. This is important because interrupt service time often must be minimized.”

### 2. Question:

I see old Z80 part numbers Z8400 and Z0840004PSC. Are these different devices?

## The Channel

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### Answer:

Previously, Zilog only manufactured NMOS process technology products and used 5 digits for the base part number. When Zilog started manufacturing their CMOS versions of the same NMOS devices, Zilog increased the base part number to 6 digits. So the NMOS Z8400 became the Z08400 while the CMOS version became Z84C00. For the Z0840004PSC, the base part number is Z08400, speed grade is 04 for 4MHz, P is plastic DIP, S is standard temperature (0C-70C), and C represented the Leaded Package assembly process.

The Z8400 and Z0840004PSC are the leaded NMOS versions of the Zilog Z80 and are no longer available. The replacement part would be one of the following which are the CMOS, RoHS, extended temperature versions:



Part Number	Description
Z84C0006PEG	6 MHZ Z80 CMOS CPU XTEMP (L/F)
Z84C0008PEG	8 MHZ Z80 CMOS CPU XTEMP (L/F)
Z84C0010PEG	10 MHZ Z80 CMOS CPU XTEMP (L/F)
Z84C0020PEG	20 MHZ Z80 CMOS CPU XTEMP (L/F)

### 3. Question:

What happens if the eZ80 CPU gets a WDT Time Out as a Non-Maskable Interrupt after I erase the block of Flash containing the Interrupt/ reset vectors? Does it generate a Reset?

### Answer:

What happens on the Watchdog timeout after the block of Flash containing the Interrupt/ reset vectors was erased is that all bytes in the vector table effectively become 0xFF. But to the eZ80 CPU, the value 0xFF is a "Rst 38" assembly instruction.

Therefore if a watchdog or some other exception/ interrupt handler occurs while the customer has a vector table containing 0xFF, the system will do a RST 38. The best workaround is to immediately code all the reset handlers to look like the RST 0 handler.

Keep an eye out for our newsletter next quarter for more of our informational Tips & Tricks!

**Zilog Tips & Tricks ...  
to make your life easier!**

Zilog continues to bring you the most updated technical information so you can design with ease. Using Zilog's Application Notes provides you with all of the technical information you need in order to create and design without guessing games. We have new Application Notes, which are listed below; click your Application Note of choice to take a look at the information we have to get you started on creating your designs today.

Zilog also provides application solutions that provide all of the information you need for your design needs from start to finish. Everything you need to get started is provided in one simple sheet, in one designated area. Our '[Reference Design and Application Solution Cookbook](#)' details all of the application solutions Zilog has available.

Take a look at the recently added Application Notes.

▶ Ethernet Frame Transmission Using the eZ80F91 MCU (AN0212)

▶ A Nonblocking UART for Z8 Encore! MCUs (AN0349)

# Zilog Interactive Web Forum

## The Channel

Zilog Technical News & Information

Our [Forum](#) is an interactive site that has many uses and advantages for our customers. It's a great platform to share fun and unique ways in which you are using Zilog products. You can also get to know other Forum users and share common interests, as well as find ways to create clever solutions.

Come visit our Forum and interact with other Forum users, and you could win a Development Kit of your choice for your design needs. Winning a Development Kit will provide you the opportunity to learn more about Zilog's products, and will provide ease of application design. We have already given away Development Kits to top posters, and you could be next!

Our Technical Engineers are always available to assist you with technical solutions to application design challenges. We want to hear from you, and we welcome productive feedback.

Zilog has an endless drive to be the best we can be for our customers. We consistently evolve and optimize our technologies, so you're not limited on possibilities. As with all technologies, it's always a work in progress.

Come join [Zilog's Forum community](#) to share your thoughts with us. We are here to listen, share, and provide the best solutions for your application needs!

**Hot Topics**

- Anyone from Zilog thinking in? (17 Replies)
- Any way to get sources for ZTP E,34E (17 Replies)
- R&D and Open-source support (17 Replies)
- Distance Measurement using Zilog (22 Replies)
- Lead Matrix Board via SMS using Zilog encode (17 Replies)

**Latest Replies**

Thread	Last Poster	Views	Replies
Arbuno 7.1 wonder ... (Just thoughts)	Mc	23	2
Arbuno 7.1 wonder ... (Just thoughts)	Ryan Crawford	23	2
Arbuno 7.1 wonder ... (Just thoughts)	Mc	23	2
Arbuno 7.1 wonder ... (Just thoughts)	Ryan Crawford	23	2
Arbuno 7.1 wonder ... (Just thoughts)	Adrian Wallace-Hick	23	2

**Zilog Forum Stats**

- Total Users: 21807
- Latest Member: svbfagqwee
- Total Messages: 1068
- Total Subjects: 263
- Total Categories: 8
- Today Open: 0
- Yesterday Open: 0
- Today Total Answer: 0
- Yesterday Total Answer: 0

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November 2013 • Issue 14

## Zilog Releases New Mini-Z® USB 28-Pin Design Board

*Latest in a Series of High-Performance Boards and Modules*

*Offering Industry-Compatible Stamp Footprint for New Product Designs*

Milpitas, CA, June 4, 2013 – Zilog, a wholly-owned subsidiary of IXYS Corporation (NASDAQ:IXYS) and a pioneer supplier of microcontrollers (MCUs) providing solutions for the industrial, telecommunication, automotive and consumer markets, today introduces a new reference design, the Mini-Z USB Design Board.

Zilog's Mini-Z USB Design Board incorporates a USB host and peripheral functionality with Zilog's portfolio of Mini-Z modules. This hardware design uses a Max3421E USB transceiver to provide an interface to USB communications with supporting power-limiting and connection circuitry. The design also incorporates a Secure Digital (SD) card using its SPI interface. The Mini-Z USB Design Board firmware includes host functionality for USB mass storage devices and Secure Digital (SD) card support.

The Mini-Z USB Design Board includes all of the hardware necessary to

develop prototypes and projects incorporating the host and peripheral functions on Zilog's wide selection of MCUs. The Board is designed to be operated by either a 9V battery or an external power supply.

Mini-Z USB Design Board Features:

- Low/full speed USB host capability
- Secure Digital (SD) card
- Full-speed USB peripheral capability
- USB serial communications

The Mini-Z USB Design Board can be used to develop a number of applications. The following list offers a few ideas:

- Secure Digital-to-USB converter
- Adding removable storage to Zilog MCU projects
- Adding USB Human Interface Device (HID) input for Zilog MCU projects

The Mini-Z USB Design Board also ships with a USB host shell application

that provides the ability to access USB mass storage devices (using FAT16/FAT32 file systems) and SD/MMC cards from the shell. Every module in Zilog's Mini-Z product mix is preloaded with a boot loader and this control shell. Additionally, this shell facilitates access to any Mini-Z module and to the Mini-Z USB Board, which the module attaches to.

"Zilog's Mini-Z's provide complete module and board systems for bringing fast time-to-market solutions.

Their flexible design allows them to work together with other stamp modules and carrier boards so they can be used independently in creative application designs," commented Steve Darrough, Zilog's VP of Marketing.

Zilog's Mini-Z USB Design Board is available in the Reference Design category of the [Zilog Store](#). For more information, please visit [www.zilog.com](http://www.zilog.com).

## Zilog Announces New ZAURA™ Wireless Controlled Power SSR for AC Power with a Remote Control

*High-Performance Reference Design Solutions  
Offering Wireless Digital Power Management and Connectivity*

Milpitas, CA, August 15, 2013 – Zilog, a wholly-owned subsidiary of IXYS Corporation (NASDAQ:IXYS) and a pioneer supplier of microcontrollers (MCUs) providing solutions for the industrial, telecommunication, automotive and consumer markets, today introduces its new ZAURA Reference Design to expand its portfolio of digital wireless solutions that target the industry need for wireless connectivity in control, sensing, eliminating standby power consumption and for power metering applications.

This reference design integrates Zilog's ZAURA RF 868 MHz Wireless Module onto a Current-Sensing Power SSR. The product is designed to showcase wireless control of an AC power SSR. The IXYS ICD power SSR is part number CPC1966, with an AC zero-crossing detection to minimize surge currents and sine wave distortions. This reference design can be used as a basis for developing systems that can control different power products.

Continued on page 36

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An IXYS Company

On its own, without the ZAURA RF Wireless 868 MHz Module attached, this design's Base Power Board functions as a development board to provide current to power the Module and the switch. This Base Power Board, with the Module attached and controlled by a hand-held remote control device, enables RF communication to turn a load on and off. To demonstrate RF control, a hand-held ZAURA RF remote control device is also included with this reference design. Documentation supplied with this reference design provides specifications and schematics, describes its software commands, and also provides a procedure for quickly getting started with development.

"The Current-Sensing Power Switch SSR can be used to develop a number of applications, including remote-operated commercial or architectural

lighting, private lighting with remote control convenience features and remote-operated household or industrial equipment. This new RF platform helps to shorten the time-to-market scenario across a wide range of wireless power management applications. Customers can remotely control their connection to a power grid, or machines can control their grid connectivity automatically based on load conditions," remarked Steve Darrough, Zilog's VP of Marketing.

Zilog's ZAURA Current Sensing Power Switch SSR Reference Design is now available for customers that place orders through the [Zilog Store](#). For more information, please visit [www.zilog.com](http://www.zilog.com).

## Zilog Announces Release of S3 Family of Microcontrollers

*Offering of High-Performance Lower-Cost 8-Bit Z8-Compatible CPUs*

Milpitas, CA, August 10, 2013 – Zilog, a wholly-owned subsidiary of IXYS Corporation (NASDAQ:IXYS) and a pioneer supplier of microcontrollers

(MCUs) providing solutions for the industrial, telecommunication, automotive and consumer markets, today launched its new S3 Family of

Z8-compatible microcontrollers (MCUs), thereby expanding its portfolio of microcontroller products serving the industrial, medical, and consumer markets.

The S3 Family of 4-/8-bit products includes MCUs for remote control devices, ultra-low power MCUs, and a series of products for home appliances, consumer electronics, and LCD displays. Applications include battery chargers, thermostats, boiler control, microwaves, e-bikes, LED lighting, power meters, blood pressure meters, smoke detectors and more.

This release of the S3 Family completes a strategic move by Zilog's parent company, IXYS, which acquired its portfolio of S3 products from Samsung.

"These 8-bit products fit with our mixed-signal ICs and our power semiconductors, whereby we will be able to offer our customers complete solutions for power management – from digital-control analog-driver ICs to higher-power devices, under the World of IXYS experience," said Dr. Nathan Zommer, Chairman and CEO of IXYS. "We now offer a rich set of MCUs, in addition to this S3 family – from the classic Z8-based SOCs to the popular Z8051 MCUs."

Zilog established itself nearly forty years ago as a trusted supplier of its classic cores, the Z80, Z8, and Z16 MCUs, for a variety of applications. Historically, the SAM8 and SAM88 CPUs that are the core of the S3 Family were based on Zilog's efficient Z8 architecture. For Zilog to introduce the S3 Family is simply a natural evolution culminating in a cooperative agreement between IXYS and Samsung. The S3 addition offers Zilog customers a wider MCU base, with freedom to design products with their cores of preference. New targeted customers within the World of IXYS products, with existing embedded design platforms using the S3 cores, now have an MCU supplier committed to the long-term support of their manufacturing needs with a wide range of peripheral mixed-signal circuits, driver ICs, power management circuits and power semiconductors.

Zilog's S3 Family of products and development kits are now available for customers that place orders through specific distributors identified by Zilog. For more information, please visit [www.zilog.com/S3](http://www.zilog.com/S3).

Continued on page 38

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## Zilog Announces New ZMOTION® AC Load Controller Reference Design with Advanced Motion Detection Technology

*Enabling Energy Savings and Occupancy Detection*

Milpitas, CA, October 10, 2013 – Zilog, Inc., a wholly-owned subsidiary of IXYS Corporation (NASDAQ:IXYS) and a pioneer supplier of microcontrollers (MCUs) providing solutions for the industrial, telecommunication, automotive and consumer markets, introduces its new ZMOTION AC Load Controller Reference Design to expand its portfolio of digital motion detection solutions that target industry requirements for motion sensing and control of lighting and HVAC applications.

This reference design demonstrates how to use Zilog's ZMOTION MCU with an IR-based motion detector to control power to an AC load in applications such as lighting and HVAC systems. This reference design uses the 8-pin Z8FS040 ZMOTION MCU to intelligently control a mechanical relay and provides adjustable controls for motion sensitivity, delay time and ambient light level.

This new reference design also features Smart Delay technology. With Smart Delay, when motion is detected while the mechanical relay is powered off, the relay's running time is initially set to a maximum of 10 seconds rather than the full delay time set by the Time Delay potentiometer. If additional motion is detected within this 10-second period, the full delay timer set by the potentiometer is used. If additional motion is not detected, then the 10-second delay expires and the load is switched off.

This methodology is useful for room occupancy detection and lighting control applications. For example, when the delay time is set for durations greater than 10 seconds and a person enters and leaves a room quickly, the lights are not turned on for the duration of the full delay time; instead, they are turned on for only 10 seconds.



When an additional Delayed Detection feature is enabled and motion is detected while the delay time is set to 5 minutes or greater, motion is ignored until the final full minute of the delay cycle.

This methodology is useful when the delay is set to a long value and the environment is harsh. It serves to ensure that the light does not remain on due to false motion events. When this feature is not enabled and motion is detected, the system immediately starts looking for motion again, and retriggers the output if motion is detected.

“This AC Load Power Controller can be used to develop a number of applications, including remote-operated commercial or architectural lighting, private lighting with remote control convenience features and remote-operated household or industrial equipment,” remarked Steve Darrough, Zilog’s VP of Marketing.

Zilog’s ZMOTION AC Load Controller Reference Design featuring advanced motion detection technology is now available for customers that place orders through the [Zilog Store](#). For more information, please visit [www.zilog.com](http://www.zilog.com).



### **BREAKING NEWS!**

Zilog will have a two week Holiday Shutdown starting on December 23, 2013. We will be back in the office on January 6, 2014. Happy Holidays, everyone!!

# The Channel Archive

**The Channel**  
Zilog Technical News & Information

Please click below to view past issues of The Channel.



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Issue 2  
November 2008



Issue 3  
April 2010



Issue 4  
July 2010



Issue 5  
October 2010



Issue 6  
January 2011



Issue 7  
April 2011



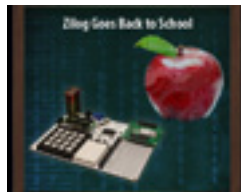
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Issue 9  
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Issue 10  
April 2012



Issue 11  
August 2012



Issue 12  
January 2013



Issue 13  
June 2013

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