zilog Embedded in Life
An IXYS Company

The Channel

Zilog Technical News & Information

January 2011, Issue 6

Zilog is Here and Better Than Ever! »

Providing Powerful Solutions for Today's Needs

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October 2010 | Issue 4

The Executive Corner

Zilog's future is looking bright and growing again. We want to extend our appreciation for the loyalty and support from our customers – those of you who have held true with us over these many years as well as you new designers who are giving Zilog the opportunity to serve your new applications, products and services.

The industry has evolved in many ways, and although the shifting winds of change may alter the course of the industry's focus and priorities, the need for the microprocessor has continued to hold steady as the right choice for so many needs. Even with the many new products emerging on the market that have been created to solve more and more sophisticated needs, the value and use of the 8-bit microcontroller market continues to hold true – they're still exactly the right solution for so many of today's needs.

To be true, Zilog receives some very direct questions regarding our strategic direction – questions such as:

- Why no new products in so long?
- Are you going to support an ARM core?
- How do you expect to compete in the current market?
- What is your new microcontroller roadmap?
- Is Zilog still around?
- Will you ever be *numero uno* again?

Well, it's been a challenge, but with today's can-do model here at Zilog, we now hope folks are seeing us coming back in a big way.

We now have clearly-defined new product roadmaps moving forward, with a commitment for developing new silicon, modules, and new energy management platforms (watch for several new announcements in our 2011 press releases).

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The Executive Corner

Zilog launched several new products in 2010 and are starting this New Year out right with an exciting new product line-up in the first quarter of 2011. These are huge steps in the right direction, and we're making significant progress in many areas of the company including new improvements in our development tools, numerous and relevant new application notes being released, and the updated Zilog website, which is far more current in its design and functionality.

These are examples of the many ways Zilog is stepping up to provide excellent service to our customers, both new and long-established. Even the inspired return of Captain Zilog, "Titan of Technology" in a clever new series of stories is meant to entertain – but with a highly evident "moral of the story" tagline!

In review, Zilog is back and listening to you, our most valued customer. We encourage your thoughts, either directly to me or by your participation within the interactive Zilog Forum which we created to support you, the Zilog community. Your ideas and suggestions are always welcome!

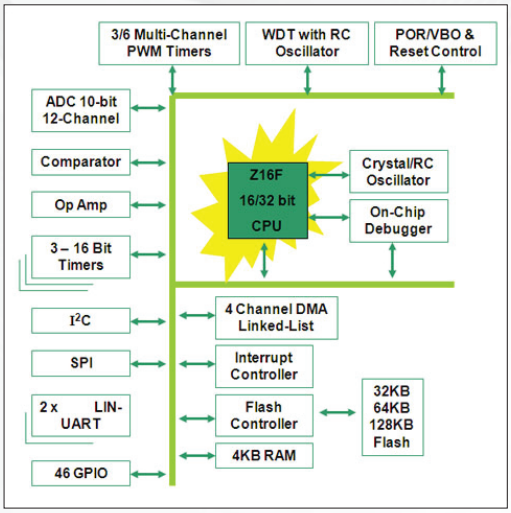
Steve Darrough
Director of Marketing, Zilog, Inc.

Product Spotlight

Zilog has recently announced the Z16FMC Family of 16-bit microcontrollers that, in addition to 4 channels of Linked List DMA, provides automated interoperation between the ADC and Timer and between the Comparator and PWM outputs.

Sensorless control of BLDC motors requires a microcontroller with fast interrupt response to handle PWM updates in real time. For applications that require additional functions such as high-speed serial communications, PWM demodulation, complex user interfaces and display control, the ability for the core motor control peripherals to operate autonomously becomes vital.

The Z16FMC Motor Control Series provides an excellent upward migration path from the Z8FMC16100 series and is also suitable for Permanent Magnet Synchronous Motors (PMSM) and AC vector control applications.



The Sensorless BLDC Development Kit, available from Zilog, is based on the Z16FMC28 device and uses high-efficiency IXYS MOSFETs to provide a very economical solution for control of a 30W three-phase BLDC motor. The Development Kit ships complete with:

- Z16FMC28 Series MDS Development Board
- BLDC Motor Control Application Board

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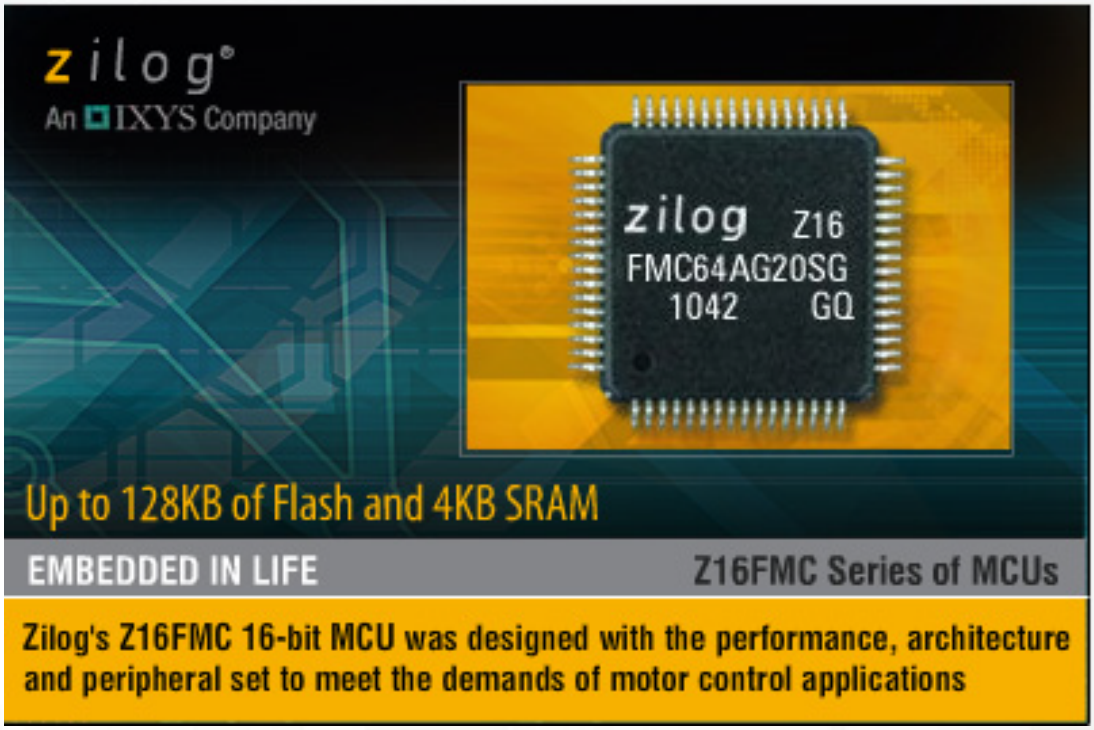
Product Spotlight

- Brushless DC (BLDC) motor
- Opto-isolated USB Smart Cable
- 5V DC universal power supply
- Zilog Developer Studio II IDE with a full ANSI C-Compiler
- Sample code

All source code is provided with the Development Kit (Z16FMC28200-KITG). For details, please visit the Zilog website at www.zilog.com.



ZMOTION

Zilog has just introduced its New Solution Kits for the ZMOTION Detection and Control Family. The kits are based on the Zilog high-performance MCUs with integrated Motion Detection Algorithms combined with a selection of Lenses and Pyroelectric Sensors to fit a wide range of application requirements. Optimized configuration parameters for the ZMOTION MCU are provided for each lens/sensor combination ensuring the best possible performance while significantly reducing development risk and cost, and minimizing time to market for customers who develop motion activated products.

Zilog currently offers the ZMOTION MCU as “stand alone” or bundled with 10 different lens and PIR sensor combinations that have been specifically tuned for a wide variety of applications. These lenses and PIR sensors fit a variety of customer detection, energy management, occupancy, and lighting control applications. Zilog is pleased to announce that two new bundles will be added to the existing portfolio. The NCL- 10IL and the NCL-3B are both small form factor circular lenses that clip directly on to the pyroelectric sensor eliminating the need for any mechanical lens holder designs. Both are suitable for entry and proximity sensing applications. The NCL-10IL provides a wider coverage (70 Degrees) than the more narrowly focused NCL-3B (40 Degrees). The lenses are physically the same size allowing them to be interchanged to select the solution that best fits your specific application.

Manufacturer	Part Number	Description	Typical Applications
Fresnel Technologies	CM 0.77 GI V3	Ceiling Mount Array (360°) 37mm diameter circular lens 19.6mm focal length 3.7m radius at 2.4m height 3:1 floor coverage diameter to height ratio	Ceiling Mount for standard commercial heights • Lighting Control • HVAC Control • Meeting rooms
Fresnel Technologies	CM 0.77 GI V5	Ceiling Mount Array (360°) 37mm diameter circular lens 19.6mm focal length 12.2m radius at 12.2m height 2:1 floor coverage diameter to height ratio	High Ceiling mount for commercial and industrial applications • Commercial Lighting Control • Commercial HVAC Control
Fresnel Technologies	CWM 0.5 GI V1	Ceiling/Wall Mount Array (160°) Circular lens with 24mm x 24mm square base 14.2mm focal length Board mount clip-in	Wall or ceiling mount for office or meeting room lighting and HVAC control • Room Lighting Control HVAC Control
Fresnel Technologies	AA 0.9 GI T1	Animal Alley Array (88°) 35.6mm x 49.9mm Flat Fresnel 22.9mm Focal Length 25 Meter Range 22 equal segments	Corner wall mount or very high ceiling with rectangular floor pattern • Warehouse Lighting (Bay Light) • Combined Intrusion and Lighting Control • HVAC
Nicera	NCL-9(26)	Clip-on 15mm Array (360°) Clips on to pyroelectric sensor 2.25m radius at 2m height 2.1:1 Floor coverage diameter to height ratio	Room Occupancy and Proximity Sensing • Lighting Control • HVAC Control • Appliance • Kiosk/Display Control • Vending Power Management Appliance • Power Management
Nicera	NCL-3B	10mm Wall/Ceiling Mount Array (60°x60°) Clips on to pyroelectric sensor 4 beams (X); 2 beams (Y) 10m range	Proximity or entrance detection • Kiosk • Vending • HVAC • Display counters
Nicera	NCL-10IL	10mm Wall/Ceiling Mount Array (80°x30°) Clips on to pyroelectric sensor 6 beams (X); 2 beams (Y) 10m range	Proximity or entrance detection • Kiosk • Vending • HVAC • Display counters

The worldwide adoption for improved motion sensing and control is growing rapidly, especially for energy management applications, and safety and security applications. IXYS and its divisions have been participating in the energy, power management markets, and the security industry

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Product Spotlight

for decades, especially with our power semiconductors, ICs and Solid State Relays. These new ZMOTION products by our Zilog team expanded our solutions to the smart motion detection capabilities, where smart motion sensing is key for occupancy detection. Besides the obvious, which is motion detection for alarm systems, our more sophisticated motion sensing enables 'occupancy based' energy management products for lighting, climate control, and safety systems in facilities, homes, trains, boats and vehicles. Add the ability to control our power semiconductors with these ZMOTION MCUs and it's clear to our customers that they can get the whole solution, from the detection side to the power output load control as a one stop shop.

The Zilog ZMOTION Product Family is currently available and in full production. For more information, please visit www.zilog.com/zmotion

Tools & Tips

Zilog Encore!® ZDS II Version 5.0 is now released!

This is a major revision for the latest in the series of world class tool platforms for the Zilog Encore! Family.

The new features for the Encore! ZDS II version 5.0 include:

- Added Windows 7 support
- Added Intelligent Editor support
  - Write code faster with Auto Completion, Call tips, Auto Indentation, multiple clipboards, line and block comments, abbreviation & expansion, auto insertion of braces and quotes, long line indicator & UNICODE support.
  - Read code faster with auto syntax styler, code folding margin, line number margin, type info tips, highlighting and finding matched braces, matching preprocessor conditional macros, wrap long lines, indentation guides zoom in/out.
  - Navigate intelligently with bookmarks, opening include file and highlighting PC line.
  - Identify & correct mistakes with highlighting of mismatched braces and auto conversion of . to ->
- Added color configuration per syntax style for easier reading and identifying
- Added printing capability for the following windows: output, disassembly, call stack, sym- bol, memory and register. To print the window content, click on the content of the window and press CTRL+P or right mouse-click on the window and select "print".
- Information on the memory footprint (RAM and ROM) -- how much has been used and how much is still available -- is now output to the build window at compile time
- Segments whole names are changed by the linker CHANGE directive are now displayed under the changed name

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Tools & Tips

(with a reference to the original name) in the map file, to reduce confusion

Supported Operating Systems:

- Windows 7 64-bit
- Windows 7 32-bit
- Windows Vista 32-bit
- Windows Vista 64-bit
- Windows XP Professional 32-bit
- Windows 2000 SP4

Tips & Tricks

1. **Problem**: How do I use the Z80182 internal DMA with the internal ESCC?

   Resolution: There is no direct method via the Z80182 control registers to connect the DMA to ESCC internally. You must use the internal DMA and ESCC as if they were external peripherals and connect the W/REQ pin to DREQ pin and DTR/REQ pin to DREQ1 pin of the Z80182.
   The application note AN0096 in Table 14 shows how to connect a DMA to a SCC. The connections and initialization is done the same for a DMA to ESCC peripheral.

Please see below:

From document number AN0096, page 32: **Table 14** lists a program example for the Z180/SCC DMA transfer test.

Table 14: Test Program-Z180/SCC DMA Transfer

```
* Test program for 180 DMA/SCC
*
* Test 180's DMA function with SCC
*
* 180 dma - dma0 for scc rx data
* dma1 for scc tx data
* async, X1 mode, 1 stop, speed = pclk/4
* self loop-back
* Connect W/REQ to DREQ0 of 180
* DTR/REQ to DREQ1 of 180
*
* B register returns status info:
* Bit D0 set : Tx DMA end
* D1 set : Rx DMA end
* D2 set : Data doesn't match
```

2. **Question**: What happens if the WDTEN bit in the Oscillator Control Register (OSCCTL) is reset to 0 when the WDT is enabled to run using WDT instruction?

Answer: This bit controls the WDT RC Oscillator. Setting this bit to '0' will cause the WDT RC Oscillator to stop oscillating. Even if the WDT was previously running by using the WDT instruction, the WDT will stop counting once this bit is reset since its RC Oscillator is stopped. In this case if the WDTEN bit is set to '1' then the WDT will resume counting from its last count.

3. **Question**: Where can I get copy of the old DOS based Z80 CPU Assembler?

   Answer: You can request a copy from our On-Line Tech Support at zilog.com.

4. **Problem**: The product specifications state "Stop Mode Recovery does not affect any other values in the register file, including the stack pointer, register pointer, flags, peripheral control registers, and general-purpose RAM." Yet when I recover from stop mode, all my variables have been re-initialized.

   Resolution: Stop Mode Recovery begins execution at the address located at the RESET VECTOR. The RESET VECTOR points to the reset procedure that contains the startup procedures. The startup procedure initializes the memory, flags, registers and RAM and it is located in the file startups.asm or startupl.asm (depending on your build type, small or large). You can prevent initialization of memory when recovering from a Stop Mode by modifying the reset procedure. Typically, you will create a new Reset procedure that verifies where the Reset was called from. If it is was called from a System Error or Reboot, then route it to the original reset function, otherwise, handle the stop mode recovery.

App. Notes & Cut Sheets

Zilog strives to provide our customers with all of the information they need to design their applications from beginning to end. Everything is provided in one simple document, in one designated area, so you don't have to worry about looking elsewhere for the information you need.

We are pleased to bring you various new Application Notes and a new Cut Sheet that provides you a one stop shop recipe to fulfill your design needs.

These documents will help you exploit the full potential of your application designs, and allow you to quickly discover the possibilities. The best way to explore the many capabilities Zilog's solutions have to offer is to see our Application Notes for yourself. Click on any of the links below to begin.

New Application Notes:

Controlling Power w/ZMOTION & Clare Relays

Enabling Low Power Modes w/Z8 Encore! XP

Sensorless Brushless DC Motor Control w/Z16FMC

In addition to our Application Notes, Zilog also offers one stop shop Cut Sheet recipes to provide all the information you need for your application designs in one designated area.

Get started right away! Locate the one that's right for your needs at www.zilog.com.

New Cut Sheet:

AC Induction and Brushless DC Motor Control

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AC Induction and Brushless DC Motor Control
Zilog's Z16FMC Series Flash Microcontrollers

Zilog's Z16FMC Series of Flash microcontrollers are ideal for 3-phase and single-phase AC induction, permanent magnet synchronous motors (PMSMs), and brushless DC motor control. These motors are typically used in industrial variable frequency drives (VFDs), elevators, fans and pumps, compressors, and large appliances.

The sixteen 32-bit general-purpose registers support complex CISC addressing modes and a single-cycle instruction set that includes capabilities needed to compile compact, efficient, machine code. Low instruction overhead allows you to avoid limitations on CPU bandwidth.

The Z16FMC Series features a flexible pulse width modulator (PWM) module with three complementary pairs or six independent PWM outputs supporting programmable deadband and fault protection trip input. These provide multiphase control capability for a variety of motor types and ensure safe operation of the motor by providing pulse-by-pulse or latched fast shutdown of the PWM pins during a fault condition.

The separate timer for the PWM module allows the other timers to be used for time-stamp operation so that you can efficiently regulate the speed of the motor.

The ADC has a 2.5µs conversion time and can be triggered automatically by the PWM module, reducing interrupt rates and jitter for back EMF or current measurements and giving you total control of each PWM cycle of the motor.

Four channels of linked-list DMA supporting memory and peripheral transfers significantly reduce CPU overhead. It can be used to directly control the PWM module when generating complex waveforms.

The Z16FMC Series Development Kit includes everything you need to start working with the Z16FMC family of devices. The kit includes a development board, BLDC motor, USB debugger, and ZDSII integrated development environment.

Product Brief: PB0229
Product Specification: PS0287
User Manual: UM0234

Order Samples
Z16FMC Product Information
Development Kit
ZDS II Development Tools
Schematics
Source Code

Zilog Knowledge Base
Zilog Forum
Technical Support

For print version click here

Application Note
- Sensorless Brushless DC Motor Control with the Z16FMC MCU (AN0311)

Z16FMC Block Diagram

Z16FMC Series Features and Benefits

- Z16FMC Series 16-bit CPU processor core
- Up to 128KB internal Flash program memory
- Up to 4KB internal RAM
- 12-bit PWM module with three complementary pairs or six independent PWM outputs with deadband generation and fault trip input
- Three standard 16-bit timers with capture, compare, and PWM capability
- Twelve-channel, 10-bit analog-to-digital converter (ADC) with 2.5-µs conversion time
- Operational amplifier
- Analog comparator with internal voltage reference
- 4-channel DMA controller with linked-list
- Two full-duplex 9-bit UARTs with support for LIN and IrDA
- Fully integrated internal precision oscillator (IPO)
- I2C master-slave controller
- Enhanced serial peripheral interface (ESPI)
- 2.7V–3.6V operating voltage with 5V-tolerant inputs
- –40°C to 105°C operating range

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Zilog Interactive Web Forum

We are proud to provide our customers the Zilog Forum for you to ask and answer questions and to voice your opinion on today's important high-tech issues. We have put together this forum in a way to help you utilize it to its fullest potential.

The Zilog Forum is an interactive web forum that has many uses and advantages for you, our customers, so we are always looking for new, innovative ways to engage the public, and get more people involved. It promotes public engagement by actively involving our customers to enhance their knowledge of Zilog solutions, so they can make informed decisions. The Forum allows our customers to get to know other Forum users and share common interests, while finding new ways to create clever solutions.

Customers can communicate directly with Zilog engineers to determine the best solutions for their designs. An example of this would be a suggestion that was made regarding an SD card reader for a specific application solution. Zilog responded and the SD card reader is now being designed – we are listening. We have taken many strides to make the Zilog Forum the best place to go to find the information you are seeking for your design needs.

We are very excited at the prospect of having you interact with us and other Forum users as we take our next step into the future. Zilog has an endless drive to be the best we can be for our customers. We consistently evolve and optimize our solutions so you are not limited on possibilities.

You can visit the Forum for great value-added information where you can ask any questions you may have, and we'll provide the answers. All comments and suggestions are welcome. Come join our community to share your thoughts, get your answers, and get Zilog involved!

Happy Posting!

Quarterly App. Design Contest

Zilog is a trusted supplier of application specific solutions, and we continuously strive to evolve our products to meet all of our customers' needs. We have developed many great solutions and provide all the tools you need for your design applications from start to finish.

Building on our successful products, Zilog has launched our **Quarterly Application Design Contest**. This is a very exciting endeavor and we believe this contest is a wonderful way for our customers to share the impact of their designs, inspire others, gain recognition for themselves, and compete to win great gift certificates from Amazon.com.

We will be awarding prizes for the **Top Three Creative Application Designs**. Demos of these winning application designs will be featured at our Zilog tradeshow booths and other marketing communications, with the creators featured for their work and creativity.

We very much look forward to seeing our customers' creativity using Zilog solutions, and all are welcome to enter. Visit our "**Fun and New Ideas**" section in our Zilog Forum for contest details and how you can enter.

With our solutions, the possibilities are endless! We look forward to seeing your creativity.

Zilog News

10 YEAR SERVICE AWARD FROM INTELBRAS – BRAZIL

Zilog recently received a 10 Year Service Award from Intelbras, a key customer for both Zilog and IXYS/Clare. The employees of Zilog received this award for their commitment to excellence as a supplier.

Intelbras is a company that values the partnership with their employees, customers and vendors, and believes that to be successful in the Brazilian market you must find the right partner, so they rely on their suppliers to perform to the best of their ability.

What does Intelbras expect from its suppliers?

- High Quality
- Cost Effectiveness
- Above Average On Time Delivery Commitment
- Continuous Process Optimization (Performance Gain)
- Supplier Agreement
- Simultaneous Engineering (Early Supplier Involvement)
- Information Exchange

To Intelbras, this award equals "**Above Average Performance**" in each category, so Zilog is very pleased and proud to accept this award.

This achievement shows that the hard work performed by our customer service, manufacturing, product marketing, quality, and sales team is recognized and appreciated.

EE TIMES IXYS INTERVIEW – 'IXYS Revives Zilog Amid a Power Trip'
Mark LaPedus
12/4/2010 4:00 PM EST

MILPITAS, Calif. - Early last year, Maxim acquired the 32-bit microcontroller lines from Zilog Inc. Ironically, late last year, IXYS entered the unfamiliar spotlight by acquiring struggling microcontroller pioneer Zilog (San Jose, Calif.) for $62.4 million in cash. IXYS acquired Zilog's 8- and 16-bit lines, including the once-venerable Z8, which is now seen as a relic in the MCU world.

In a recent interview at the company's headquarters, Zommer, chairman and CEO of IXYS, said that IXYS can not only revive the Zilog brand, but it hopes to boost the unit's sales to $1 billion per year.

Why Zilog?

IXYS saved Zilog by buying the firm. Clearly, Zilog's future was in doubt. The Z8 was an old and tired brand that could not compete against those from Atmel, Freescale, Microchip, Renesas, among others.

But by buying Zilog, IXYS suddenly found itself competing against the 8-bit MCU giants. But there was little risk in buying Zilog. IXYS could gain some intellectual property (IP) and make inroads into a new customer base. At the time of the acquisition, the power semiconductor firm said it would preserve the Zilog brand. IXYS said the combination of the two companies will allow it to leverage analog power management with digital control.

"IXYS already supplies components to end user systems that incorporate Zilog's MCU architecture,'' Essi said in a research note. "Now the supply chain has a turnkey supplier that can fulfill a larger portion of the reference design for the end product. This strategy (MCU + power IC) is also followed at larger analog vendors Maxim and Texas Instruments, though IXYS will be using this strategy on a much smaller scale in lower volume markets.''

Today, Zilog suffers from old offering and an ''antiquated ecosystem,'' Starnes said. "There is nothing wrong with the Z8 technology,'' he said. ''It was great in its day. In 1981, they were a formidable competitor.'' In the late 1980s, Zilog lost the footrace,'' he said. "In the last five to 10 years, there have been a lot more competitors'' in the MCU space.

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Zilog News

When Zilog was an independent company three years ago, the company moved to "revitalize the brand,'' said Steve Darrough, director of marketing for IXYS' Zilog unit. Now, under the IXYS umbrella, Zilog is accelerating those efforts and "Zommer plans to take us to the next level,'' Darrough said.

In April, IXYS made good on its promise to combine the advantages of MCUs and select power/analog lines, by rolling out the first in a series of reference designs. One reference design features Zilog's Z8 and IXYS' brushless DC motor. Also demonstrated for advanced LED lighting control is the Z8 and IXYS' LED driver.

Generally, Zilog's Z8 is being positioned into niche markets, such as battery charging, motor control, motion detection, communications and energy management. Recently, Zilog introduced the ZMOTION module for motion detection applications. The solution combines Zilog's Z8FS040 series of microcontrollers with motion detection capabilities.

Zilog has a handful of new products on the drawing board. It is quietly devising a yet-to-be-announced Z8 device, which supports a radio-frequency (RF) module for 900-MHz wireless applications.

It is also attempting to resuscitate Zneo, a 16-bit CISC microcontroller. Zilog rolled out Zneo several years ago, but the product never took off and was "forgotten,'' Darrough said. Zilog is still selling Zneo, but over time, it will roll out a "trimmed down version'' of Zneo, he said.

In 2009, amid a plan to gain profitability, Zilog sold its 32-bit, ARM-based product to Maxim. Under the terms, Zilog was not allowed to sell a 32-bit line for a two-year period. The two-year grace period has nearly lapsed. Zilog is now looking at the 32-bit, ARM-based market-again, but the company has yet to re-enter that fray.

Chances are that Zilog will gain modest ground in the short term. Over time, Zilog will likely fall way short of Zommer's $1 billion annual run-rate goal. There is simply too much competition in MCUs.

Upcoming Events

embeddedworld 2011 Exhibition& Conference

Nuremberg, Germany, March 1-3, 2011
...it's a smarter world!

The **embeddedworld** Exhibition &Conference is the world's biggest exhibition of its kind and the meeting place of the international embedded community. Embedded technologies are in action everywhere, whether in the car, data and telecommunication systems, industrial and consumer electronics, military systems or aerospace. Seven hundred thirty exhibitors showed the 18,350 visitors the full range of products for embedded technologies in 2010: hardware, software, tools, services and lots more.

The embedded world Conference 2011 is something special, and Zilog/IXYS will have a booth where we will present the great design solutions we offer. Attendees are able to profit first hand from the knowledge and expertise of the most illustrious workers in the field, so please come visit us if you happen to be in the area.

ESC Silicon Valley

Learn today. Design tomorrow.
ESC
Silicon Valley • May 2 - 5, 2011
McEnery Convention Center • San Jose

This is the Industry's Leading Embedded Systems Event! For over 18 years ESC has brought together the largest community of designers, technologists, busi- ness leaders, and suppliers all in one place.

Zilog's expertise has grown beyond core silicon to include RF Wireless Technology, Motion De- tection, and Lighting and Motor Control.

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Upcoming Events

We consistently evolve with ever expanding technology, and our exhibit will showcase this evolution.

Zilog is proud to be part of this event, so please visit our exhibition, interact with us and learn how our solutions can be included in your designs.

PCIM Europe 2011

Nuremberg, Germany, May 17-19, 2011

Power Conversion Intelligent Motion (PCIM) is Europe's leading meeting-point for experts out of the areas Power Electronics and its applications in Intelligent Motion and Power Quality. PCIM offers a comprehensive, focused and compact presentation of products all under one roof!

From May 17–19, 2011, the world-wide key players of the industry meet in Nuremberg. Get the latest information on newest trends and developments as well as up to date solutions for pressing problems.

Our parent company IXYS will be in attendance and Zilog will also have a presence, so please stop by our exhibition and take a look at the wonderful synergy of our products.

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Life support devices or systems are devices which (a) are intended for surgical implant into the body, or (b) support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in a significant injury to the user. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness.

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The Channel

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