3JTech Embeds Connect One iChip in Web Cameras and Infrared Modem, Enabling Internet Connection without a PC

"Connect One's iChip Internet Controller is an innovative communications chip that enables 3JTech to maintain its reputation for innovation. It was perfect for us, since we are able to design it into several products that use different processors and have different connectivity requirements. Connect One's iChip has enabled us to be one of the first companies to introduce at Comdex 2001 a Web camera that does not require a PC for Internet connectivity."
- Dr. Wen J. Whan, CEO of 3JTech Co. Ltd.

Founded in 1988, 3JTech develops and manufactures advanced, high quality communication and security products, including web cameras, weapon detection systems, ADSL modems, industrial modems, and external and embedded modems. From its start as an exclusive OEM modem manufacturer for Macintosh, PC, and IT systems, 3JTech has evolved into a dynamic company that focuses on innovative technology, quality products, support, and niche products. The company offers R&D engineering services, manufacturing excellence, and OEM/ODM support.

3JTech is headquartered in Taipei, Taiwan, where it employs 45 engineers and an additional 40 employees in a modern manufacturing facility that includes the latest SMT and DIP line technology. 3JTech also has manufacturing and test facilities in Kaoshung, Taiwan, and Shenzeng, China, and a branch office in Los Angeles, CA.

The Challenge

Dr. Wen J. Whan, CEO of 3JTech Co. Ltd., wished to add to the Pegasus III modem family a general-purpose Internet modem that could be used in a number of industrial applications, such as remote monitoring the inventory status of a vending machine.

He also wished to Internet-enable 3JTech's CAMit Web camera, a CCD color camera that has a built-in analog modem. CAMit can be connected at any site to a regular telephone line or an extension line through an analog phone switching system. A user can dial in to monitor the site from any remote location using a computer. A built-in motion detection or other external TTL-level signal device can trigger CAMit. Upon being triggered, CAMit automatically dials out and sends images to a pre-programmed computer at any remote site. It can also send high-resolution pictures to an on-site video recorder.

3JTech's Internet-enabled version of CAMit is designed for use with remote monitoring and security applications, without needing to connect the camera to a personal computer, as is required by conventional Web cameras. The camera should be able to automatically dial to an Internet Service Provider (ISP) when triggered and send email with jpeg attachment files of the images captured to a pre-assigned address. The camera should be able to connect to dial-up and GSM wireless modems, as well as 10BaseT LANs.

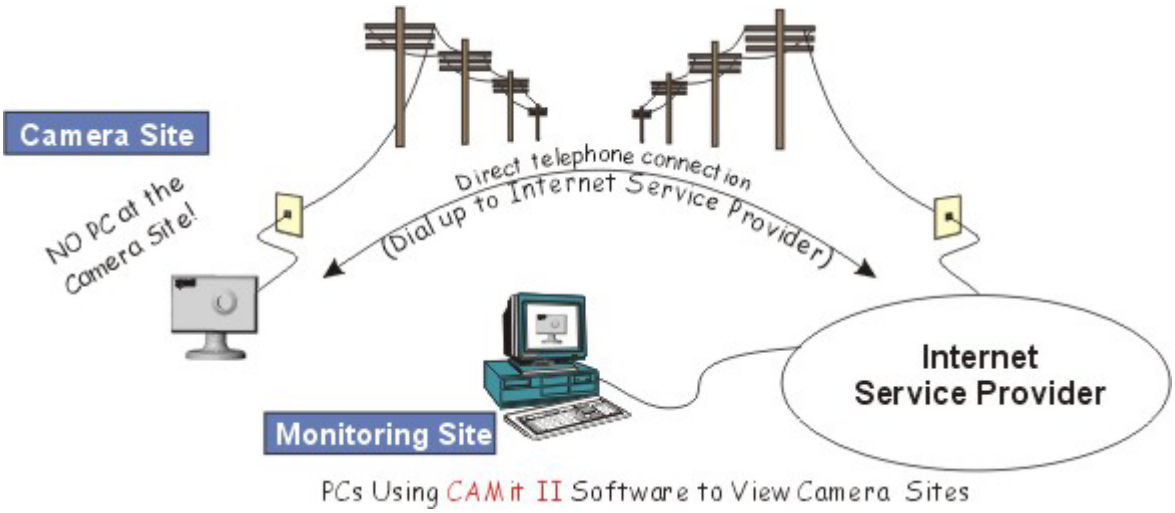

Figure: Web camera implementation of embedded Internet connectivity

While the engineers at 3JTech are experts at modem and LAN connectivity and imaging technology, Dr. Whan recognized that his company's core competency was not Internet connectivity. He did not want to engage his R&D staff in a total redesign of his modems in order to support the Internet protocols. He did not want to rewrite the application of the camera application program in order to integrate the Internet protocols. He knew that, in order to run the Internet protocols, it might be necessary to upgrade his modems to a more powerful host processor and to switch to a new operating system. Furthermore, more memory would be needed for storing the Internet protocols and configuration parameters, and for buffering the messages. Then the modem and camera application would need to be integrated and debugged until they are proven to be reliable. Finally, 3JTech's engineers would have to maintain the Internet protocols.

Rather than recreating the wheel, Dr. Whan decided to look for an off-the-shelf solution that would give him the advantage of time-to-market and that would enable his engineers to focus on their core competency. His search led him to Connect One.

The Solution

In September 2000, 3JTech received Connect One's iModem for evaluation of the 3.3-volt iChip CO561AD-S, which supports dial-up and wireless modem connectivity. As a result of tests conducted over the next few months, they determined that they wished to use iChip as the Internet engine in their iPP2-5600 TCP/IP modem and in their next-generation Internet-enabled dial-up CAMit II and wCAMit wireless cameras. According to Dr. Whan, "We selected iChip because it was easy to implement the Internet functions in all of our products using a common API."

In May, 3JTech received a quantity of iChips for prototype production. The target date to introduce the Internet-enabled products was November at Comdex 2001, the premier tradeshow for introducing innovative new high-tech products in the US.

Technical Implementation

3JTech's engineers worked closely with Connect One's technical support and R&D staff to suggest ways to optimize the performance of iChip with 3JTech's products. Adding Internet protocol commands to the iPP2 modem was easy with Connect One's AT+i™ protocol Internet extensions to the industry-standard Hayes AT command set.

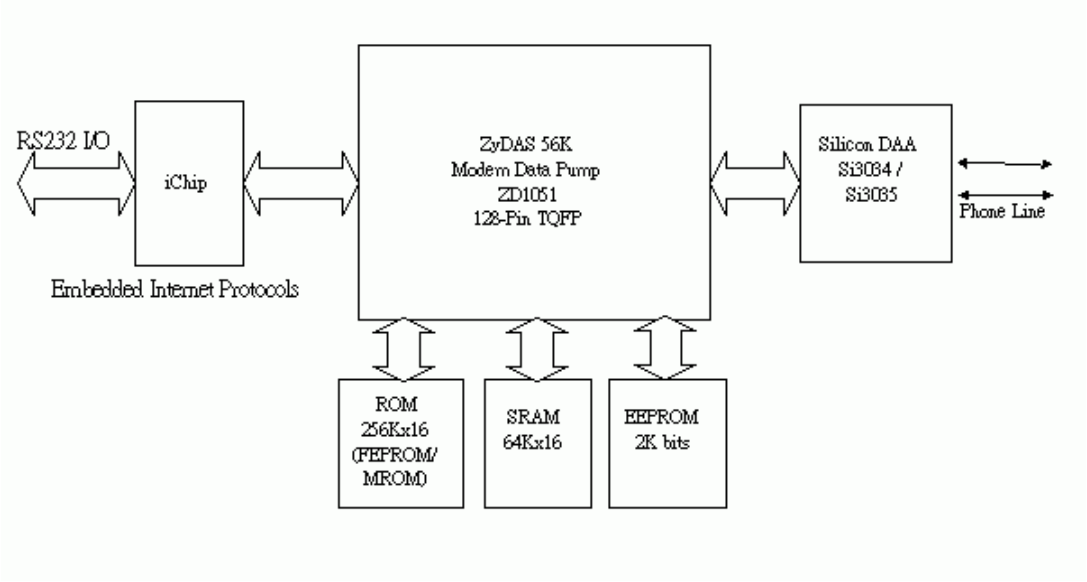

Figure: iPP2-5600 Block Diagram

The iPP2-5600 modem circuit design consists of a DSP controller, a ZyDAS V.90 56K data pump, and a Silicon Laboratories Universal DAA. The iChip Internet Controller is inserted in the path between the DSP and the data pump. The modem supports the IrDA 1.0 standard, enabling infrared communication up to 115.2 kbps, and also has a serial COM port for plug-and-play operation.

Application Note

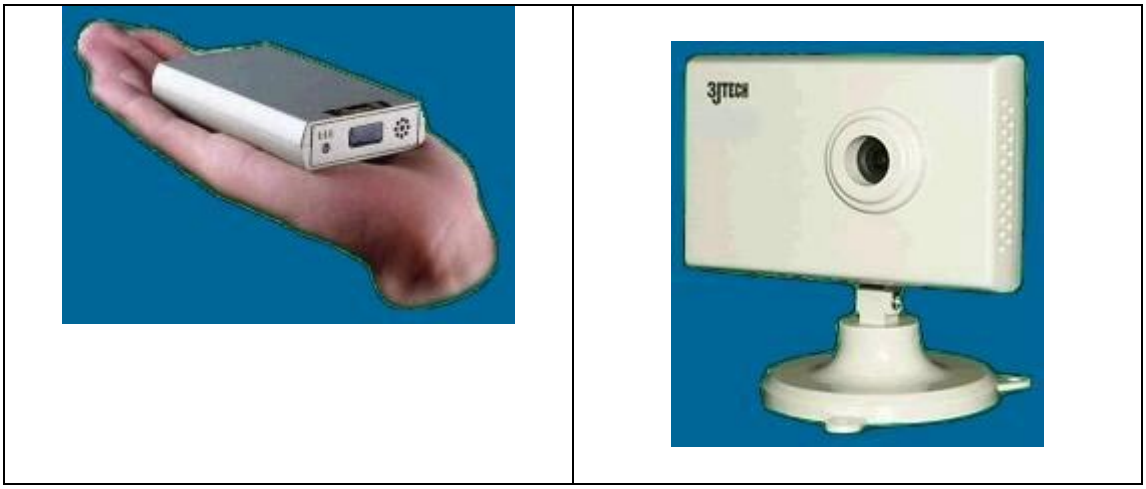

Photo: iPP2-5600 (left) and CAMit II (right)

CAMit II and wCAMit use the iChip CO561AD-S dial-up Internet Controller to package the image received from Texas Instruments' TMS320C5402 DSP into TCP/IP packets, and to negotiate the connection to the Internet via Conexant's 88168 modem chip.

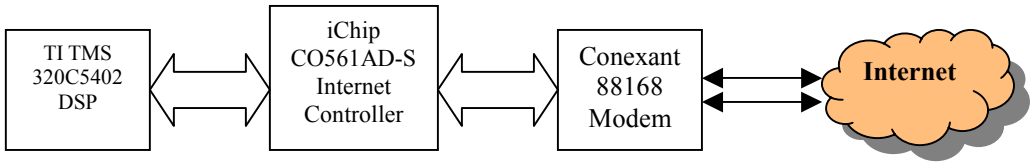

Figure: CAMit Block Diagram

"We are very happy with the support received from Connect One," says Dr. Whan. "Their versatile iChip has enabled us to quickly introduce innovative products to the market. We believe that Internet connectivity will become a key feature in many of our products."

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Application Note