

# CUSTOMER *Spotlight*

## Relio™ Custom Computing Solutions Emergency Alert & Notification

### Overview

A leading supplier of emergency notification systems used by private and governmental entities, nuclear plants, and chemical stockpile (CSEPP) sites around the country contracted Sealevel to design a custom Relio to power their newest product introduction. Upon occurrence of an event, the system can notify appropriate agencies via telephone and also perform a variety of other actions including activating warning sirens, opening, closing, locking, and unlocking doors, controlling traffic signals, and turning on or off HVAC systems.

### Application Requirements

The customer required a solid-state design running on the XPe OS. Mechanically, the computer needed to mount in a 1U rack space or to a flat surface such as a wall. I/O requirements included dual Ethernet, AC'97 compliant audio input/output, DTMF (Dual Tone Multi-Frequency) input/output, one digital input and one relay output. For visual status display, eight programmable tri-color LEDs were needed plus LED indicators for LAN activity and power. For setup and field diagnostics the design required SVGA video, USB, and PS/2 keyboard and mouse ports.

### The Sealevel Solution

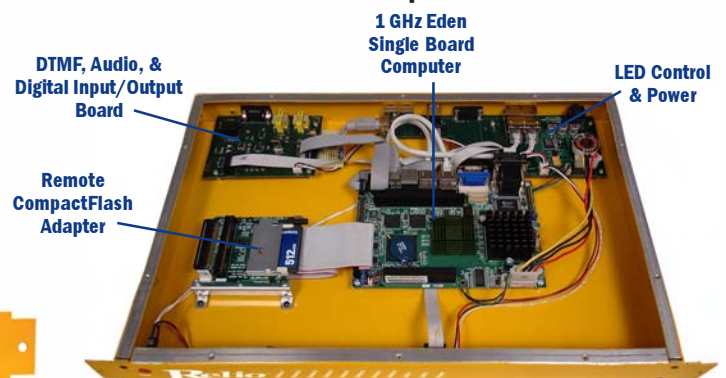
A 1U chassis was designed to incorporate a 1GHz Eden-based single board computer plus two additional micro-controller boards that provide the DTMF functionality and programmable control of the LEDs. The single board computer communicates with the micro-controllers via RS-232 using a proprietary protocol to send and receive DTMF data, interface to the digital I/O, and control the operation of the LEDs. The SVGA video, USB, and PS/2 keyboard and mouse ports are covered by a removable plate so that they are not exposed in normal system operation. The system is powered from a 9-30VDC external source.

### Key Design Challenge:

#### DTMF Capabilities

DTMF, the system used by touch-tone telephones, assigns a specific frequency (consisting of two separate tones) to each key so that it can easily be identified by a microprocessor. This application required design and implementation of a custom DTMF circuit to communicate with existing equipment using a pre-defined protocol. Additionally, audio from the sound circuit must be mixed with the DTMF tones without noise or distortion. A digital input and relay output are also included on the DTMF board and brought out on the same connector as the DTMF signals, allowing input from sensors and control of external devices.

### Relio Electronics with DTMF Capabilities



### Relio Front and Rear Panels

