

## Highlights

### MultiKey/H3434L Advanced Features:

- Fully ACPI Compliant
  - ◆ Support for 2<sup>nd</sup> Host (EC) Interface
  - ◆ Event Notification and Query command Support
  - ◆ SMBus Host Controller Interface
  - ◆ Phoenix Extensions to the EC
- Internal Scan Code Controller
- Internal PS/2 Mouse Emulation
- Support for a 3<sup>rd</sup> PS/2 Device
- Simultaneous Operation of Internal/External Keyboards and PS/2 Mice
- Hot Pluggability
- Hot Port Swapping
- HotKey Control
- Integrated Battery Management
- Power Management
- OEM Matrix Utility to Define and Download Keyboard Matrices, HotKeys and Fn Shift Table
- Direct LCD Support
- Hardware Gate A20
- Active Thermal Feedback (ATF)

### MultiKey Standard Features

- AT, PS/2, AX or OADG Keyboard
- ISA EISA and MCA Support
- Support for an External Keyboard and PS/2 Pointing Device
- Password and QuickLock™ Security
- Speed Independent Operation

## Phoenix MultiKey™/H3434L: Keyboard Firmware Solution for the Hitachi H8/3434 (IKAP-II) Keyboard Controllers

Phoenix Technologies combines extensive keyboard firmware knowledge with leading market position in portable systems' firmware to offer the most competitive and feature-rich keyboard firmware for portable systems. MultiKey/H3434L provides support for internal ScanCode Controller and an extended set of enhanced features, which are especially designed to address the needs of mobile users. MultiKey/H3434L is available to OEMs directly from Phoenix Technologies. Phoenix Technologies can also provide OEMs with custom MultiKey/H3434L code to best accommodate OEMs' unique needs.

### ACPI (Advanced Configuration and Power Interface) Compliant

By full compliance to the ACPI specification, MultiKey/MH3434L offers complete support of the 2<sup>nd</sup> host (EC) interface to the operating system. This allows access to additional functions, like battery measurement and power plane support, without interfering with the keyboard and mouse commands.

Additionally, MultiKey's ACPI functionality enables the embedded controller to support query commands that allow event notification, such as SCI, SMI or SWI events. An SMBus interface is included to provide support for smart batteries, chargers and selectors. Phoenix extensions to the EC are available to manage hotkey and other KBC SCI events as well as A-D, D-A event detection, control methods for extended commands and GPIO access.

### Hot Pluggability And Hot Port Swapping Enhances Ease Of Use

To enable a user-friendly Plug-and-Play-type environment, this feature allows the user to disconnect and reconnect external devices, such as external keyboard or pointing device, without the need to reboot. MultiKey will automatically detect the connection of the external device and restore the device state. This feature is also useful for warm or hot docking implementations. In the case where an external keyboard or pointing device is connected to the docking station, MultiKey will automatically recognize these devices.

As a further enhancement, MultiKey's **Hot Pluggability** capabilities support **Hot Port Swapping**. External keyboards or PS/2 pointing devices can be plugged into either Port 0 or Port 1. MultiKey can recognize which device is plugged into each port and can identify and restore state of devices without rebooting, regardless of the port into which they are plugged.

### Support For A Third PS/2 Port Specifically For Use With Built-In IBM Compatible PS/2 Pointing Devices

MultiKey/H3434L supports a third PS/2 port, which can be used for such devices as a Track Ball, Glide Point or Touch Pad. The data from the third PS/2 device is interleaved with the data from the standard PS/2 mouse port. This provides simultaneous operation of both PS/2 pointing devices. The operation of both internal and external devices is seamless and does not interfere with the hot pluggability or hot port swapping features offered by MultiKey/H3434L.

## **Simultaneous Support For Internal And External Devices**

The mobile user needs to use a portable computer when traveling and when in the office. To address this need, MultiKey/H3434L supports internal and external keyboards and pointing devices, simultaneously. These advanced features enable the user to use the external keyboard and PS/2 mouse to enter data and at the same time utilize special HotKey functions available only on the internal keyboard. Users can also utilize the internal pointing device, as needed.

## **Smart Battery Support Provides Battery Information To Users**

MultiKey/H3434L enables OEMs to integrate innovative battery technologies and offer better battery information to the user. MultiKey/H3434L can support either the Duracell Smart Battery via the SMBus protocol or the Sony BAX MkII LiIo battery via the Dallas one-wire protocol. MultiKey/H3434L provides SMBus emulation in software hence eliminating the need for hardware SMBus support. MultiKey/H3434L can be integrated into Phoenix BatteryScope, which enables battery information display via an advanced Windows application.

## **Enhanced OEM Differentiation With Hotkey Support**

In order to provide OEM differentiation, MultiKey/H3434L allows the internal keyboard to support up to 18 HotKeys and the external keyboard to support up to six HotKeys out of these 18. When depressed, HotKeys can either generate an SMI or set/clear a GPIO. The OEM has the flexibility to select which keys will be assigned as HotKeys. The HotKeys are configured using OEM Matrix Utility.

## **Multikey/H3434L Supports Power Management To Address Mobile Users' Needs For Increased System Life**

MultiKey/H3434L allows for power saving even while the system is in active use. MultiKey/H3434L saves battery life by maintaining the keyboard in "SLEEP" mode whenever possible during regular operations. While in sleep mode MultiKey maintains all RAM locations, registers, data and ports, and can resume normal mode while restoring system to its exact prior state. Additionally, the H8 processor can be put into a suspended mode to save even more battery life.

MultiKey/H3434L is also involved in overall system power management by:

- a.) Controlling power management by HotKeys (e.g. turn PM on/off via HotKey)
- b.) Monitoring power management variables and reacting accordingly by sending SMI or directly turning devices on/off
- c.) Maintaining the KBC state, which can be saved by system during, suspend and restored when resuming.

## **Active Thermal Feedback (ATF)**

MultiKey/H3434L can monitor system temperature via the A/D conversion, and when predetermined temperature threshold are reached it can either turn fans on/off or send an SMI. All temperature values can be OEM-configurable.

## **OEM Matrix Utility Enables Easy Configuration Of Matrix And Hotkeys**

MultiKey/H3434L supports standard matrices. The Phoenix Matrix Utility allows OEMs to further customize and differentiate their products by using the Utility to configure the number of keys and hot keys, key position and layout, functionality and format, as well as the Fn Shift Table layout and position. This allows any key to be selected as a Fn key. OEMs gain flexibility in adapting systems easily and quickly to every keyboard matrix they wish to implement. The OEM can either use the output of the utility to download the desired configuration from Phoenix NoteBIOS™ or use the Matrix Utility to download the configuration into the MultiKey/H3434L build procedure.