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## POST SCREEN ROTATION BY HOTKEY

HP INC

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## Post Screen Rotation By Hotkey

### **Problem:**

There has more and more big size (> 21") display monitor in the marketing, some of the user might not put on horizontal (width > height) and will change to vertical (height > width). We have some specific product also shipping with the monitor fixed on vertical mode like cashier system.

In OS environment, user can through graphics driver to change the display setting, it can rotate to the correct angle what user use and can be control by user.

In pre-OS environment, some of monitor mount with G-sensor, therefore BIOS can aware current display is put as horizontal or vertical and output the display correctly, like the post logo or BIOS setup or any other post message.

Some of unit would like to save the G-sensor cost and can use GPIO pin to achieve that, but the limitation is that cannot be dynamic change and need to lock down the mode (Horizontal or Vertical) before the product shipping since it cannot be changed (like cashier). This design only can apply on the unit that has fixed the monitor and cannot be rotated.

*Without G-sensor or GPIO to report the correct mode, and user does not put the monitor as normal use case therefore the screen during BIOS post cannot show up correctly, if user would like to check post message or boot into setup mean that will be a big problem for them.*

### **Objectives:**

1. Focus on pre-OS environment
2. User can choice the display mode manually
3. Hotkey support to achieve
4. No output display change without hotkey trigger

## **Solution:**

Here we propose a way to notice BIOS what the current monitor put on which mode (horizontal or vertical) user are using, therefore the screen can display as user want and to match the monitor what user setup.

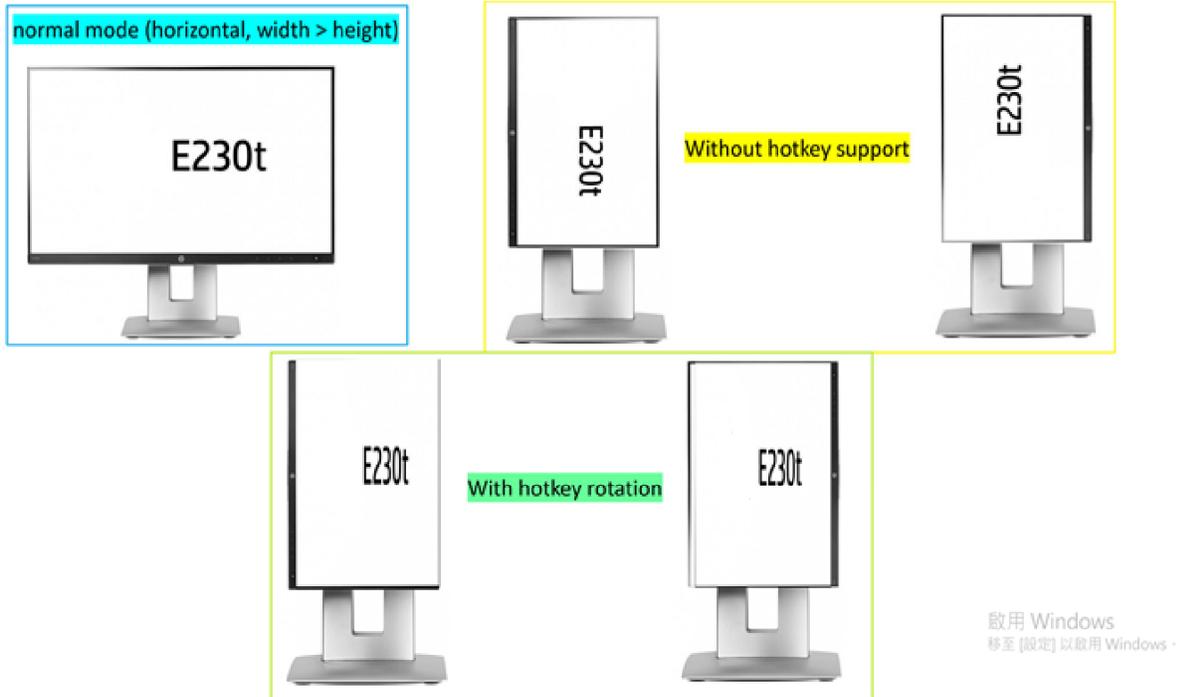
Since there is no G-sensor or specific GPIO value can report the mode to BIOS, so the quick way is to allow user input to notice system BIOS how the monitor setup with.

When BIOS post the input device like keyboard will init earlier than output device like display, therefore we can easy to catch up what user been press before monitor display. So before monitor display we can through BIOS code to control how the picture/screen will draw in the monitor, we can switch the X-axis and Y-axis to let output display turn left or right 90 degree even 180 degree also doable.

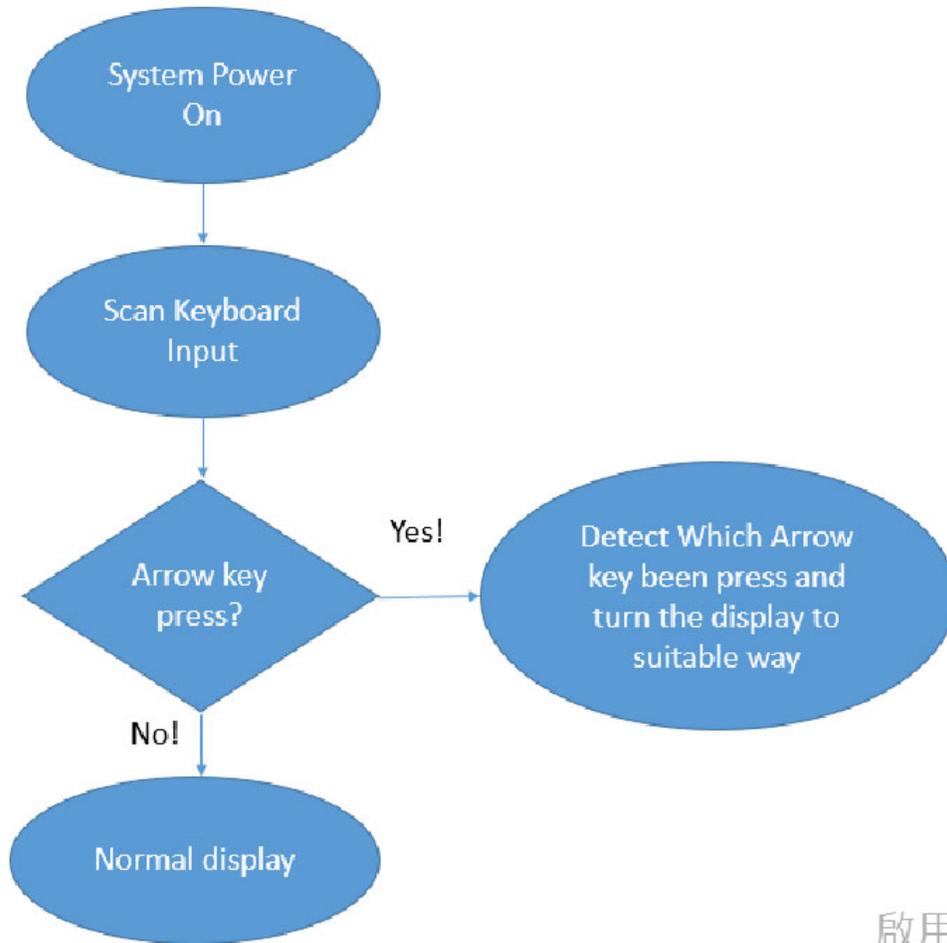
Here we define use arrow key to identify.

1. Without arrow key press means the monitor is setup as normal mode (horizontal, width > height).
2. Press left arrow key before screen display, means the monitor is setup with turn left 90 degree.
3. Press right arrow key before screen display, means the monitor is setup with turn right 90 degree.

**Demonstrate:**



### Flow Chart – Algorithm



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*Disclosed by Harry Chang, Garsin Lin, Tom Hong HP Inc.*