# Sony Programmable I/O Control Device Driver Readme



This driver enables access to the Sony Programmable I/O Control Device which can be found in many Sony Vaio laptops. Some newer Sony laptops (seems to be limited to new FX series laptops, at least the FX501 and the FX702) lack a sonypi device and are not supported at all by this driver.

It will give access (through a user space utility) to some events those laptops generate, like:

- jogdial events (the small wheel on the side of Vaios)
- capture button events (only on Vaio Picturebook series)
- Fn keys
- bluetooth button (only on C1VR model)
- programmable keys, back, help, zoom, thumbphrase buttons, etc. (when available)

Those events (see linux/sonypi.h) can be polled using the character device node /dev/sonypi (major 10, minor auto allocated or specified as a option). A simple daemon which translates the jogdial movements into mouse wheel events can be downloaded at: <http://popies.net/sonypi/>

Another option to intercept the events is to get them directly through the input layer.

This driver supports also some ioctl commands for setting the LCD screen brightness and querying the batteries charge information (some more commands may be added in the future).

This driver can also be used to set the camera controls on Picturebook series (brightness, contrast etc), and is used by the video4linux driver for the Motion Eye camera.

Please note that this driver was created by reverse engineering the Windows driver and the ACPI BIOS, because Sony doesn't agree to release any programming specs for its laptops. If someone convinces them to do so, drop me a note.

## Driver options:

Several options can be passed to the sonypi driver using the standard module argument syntax (<param>=<value> when passing the option to the module or sonypi.<param>=<value> on the kernel boot line when sonypi is statically linked into the kernel). Those options are:

| | |
|---|---|
| minor: | minor number of the misc device /dev/sonypi, default is -1 (automatic allocation, see /proc/misc or kernel logs) |
| camera: | if you have a PictureBook series Vaio (with the integrated MotionEye camera), set this parameter to 1 in order to let the driver access to the camera |
| fnkeyinit: | on some Vaios (C1VE, C1VR etc), the Fn key events don't get enabled unless you set this parameter to 1. Do not use this option unless it's actually necessary, some Vaio models don't deal well with this option. This option is available only if the kernel is compiled without ACPI support (since it conflicts with it and it shouldn't be required anyway if ACPI is already enabled). |
| verbose: | set to 1 to print unknown events received from the sonypi device. set to 2 to print all events received from the sonypi device. |
| compat: | uses some compatibility code for enabling the sonypi events. If the driver worked for you in the past (prior to version 1.5) and does not work anymore, add this option and report to the author. |

| | |
|---|---|
| mask: | event mask telling the driver what events will be reported to the user. This parameter is required for some Vaio models where the hardware reuses values used in other Vaio models (like the FX series who does not have a jogdial but reuses the jogdial events for programmable keys events). The default event mask is set to 0xffffffff, meaning that all possible events will be tried. You can use the following bits to construct your own event mask (from drivers/char/sonypi.h):<br>`SONYPI_JOGGER_MASK 0x0001`<br>`SONYPI_CAPTURE_MASK 0x0002`<br>`SONYPI_FNKEY_MASK 0x0004`<br>`SONYPI_BLUETOOTH_MASK 0x0008`<br>`SONYPI_PKEY_MASK 0x0010`<br>`SONYPI_BACK_MASK 0x0020`<br>`SONYPI_HELP_MASK 0x0040`<br>`SONYPI_LID_MASK 0x0080`<br>`SONYPI_ZOOM_MASK 0x0100`<br>`SONYPI_THUMBPHRASE_MASK 0x0200`<br>`SONYPI_MEYE_MASK 0x0400`<br>`SONYPI_MEMORYSTICK_MASK 0x0800`<br>`SONYPI_BATTERY_MASK 0x1000`<br>`SONYPI_WIRELESS_MASK 0x2000` |
| useinput: | if set (which is the default) two input devices are created, one which interprets the jogdial events as mouse events, the other one which acts like a keyboard reporting the pressing of the special keys. |

## Module use:

In order to automatically load the sonypi module on use, you can put those lines a configuration file in /etc/modprobe.d/:

```
alias char-major-10-250 sonypi
options sonypi minor=250
```

This supposes the use of minor 250 for the sonypi device:

```
# mknod /dev/sonypi c 10 250
```

## Bugs:

- several users reported that this driver disables the BIOS-managed Fn-keys which put the laptop in sleeping state, or switch the external monitor on/off. There is no workaround yet, since this driver disables all APM management for those keys, by enabling the ACPI management (and the ACPI core stuff is not complete yet). If you have one of those laptops with working Fn keys and want to continue to use them, don't use this driver.
- some users reported that the laptop speed is lower (dhrystone tested) when using the driver with the fnkeyinit parameter. I cannot reproduce it on my laptop and not all users have this problem. This happens because the fnkeyinit parameter enables the ACPI mode (but without additional ACPI control, like processor speed handling etc). Use ACPI instead of APM if it works on your laptop.
- sonypi lacks the ability to distinguish between certain key events on some models.
- some models with the nvidia card (geforce go 6200 tc) uses a different way to adjust the backlighting of the screen. There is a userspace utility to adjust the brightness on those models, which can be downloaded from https://www.acc.umu.se/~erikw/program/smartdimmer-0.1.tar.bz2
- since all development was done by reverse engineering, there is *absolutely no guarantee* that this driver will not crash your laptop. Permanently.