ADXL345 Input 3-Axis Digital Accelerometer Linux Driver

Supported Devices

- ADXL345 [http://www.analog.com/ADXL345]
- ADXL346 [http://www.analog.com/ADXL346]

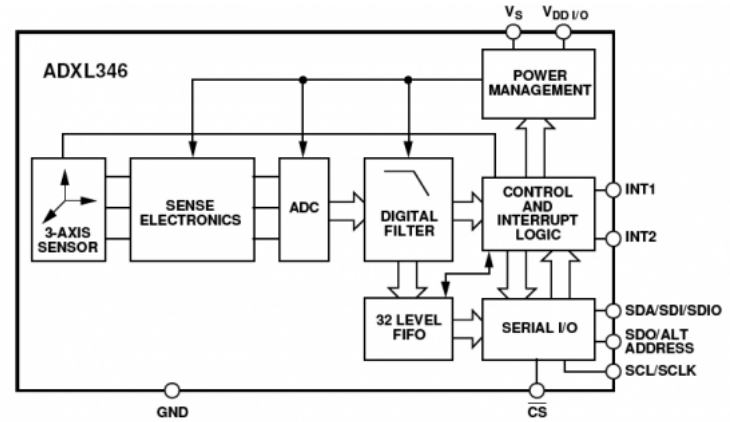
Reference Circuits

- CN0133 [http://www.analog.com/CN0133]

Evaluation Boards

- EVAL-ADXL313-Z-M [http://www.analog.com/EVAL-ADXL313-Z-M]
- EVAL-ADXL345Z-DB [http://www.analog.com/EVAL-ADXL345Z-DB]
- EVAL-ADXL346Z-DB [http://www.analog.com/EVAL-ADXL346Z-DB]

Description



The ADXL345 is a small, thin, ultra low power, 3-axis accelerometer with high resolution (13-bit) measurement up to ±16 g. Digital output data is formatted as 16-bit twos complement and is accessible through either a SPI (3- or 4- wire) or I2C digital interface.

The ADXL345 is well suited for mobile device applications. It measures the static acceleration of gravity in tilt-sensing applications, as well as dynamic

acceleration resulting from motion or shock. Its high resolution (4mg/LSB) enables resolution of inclination changes of as little as 0.25°.

Several special sensing functions are provided. Activity and inactivity sensing detect the presence or lack of motion and if the acceleration on any axis exceeds a user-set level. Tap sensing detects single and double taps. Free-Fall sensing detects if the device is falling. These functions can be mapped to interrupt output pins. An integrated 32 level FIFO can be used to store data to minimize host processor intervention.

Low power modes enable intelligent motion-based power management with threshold sensing and active acceleration measurement at extremely low power dissipation.

ADXL345 [http://www.analog.com/en/mems-and-sensors/imems-accelerometers/adxl345/products/product.html] - Small, Ultra Low Power, 3-Axis, ±2/4/8/16g Digital Accelerometer
ADXL346 [http://www.analog.com/en/mems-and-sensors/imems-accelerometers/adxl346/products/product.html] - Ultra Low Power, Three-Axis, +-2/4/8/16g Digital Accelerometer

ADXL34x Hardware Features

ADXL345/346:

- Ultra low power
- Power consumption scales automatically with bandwidth
- User selectable fixed 10-bit resolution or 4mg/LSB scale factor in all g-ranges, up to 13-bit resolution at ±16 g
- 32 level output data FIFO minimizes host processor load
- Built in motion detection functions
  - Tap/Double Tap detection
  - Activity/Inactivity monitoring
  - Free-Fall detection
- Supply and I/O voltage range: 1.8 V to 3.6 V (ADXL345) and 1.7 V to 2.75 V (ADXL346)
- SPI (3 and 4 wire) and I2C digital interfaces
- Flexible interrupt modes – Any interrupt mappable to either interrupt pin
- See data sheet for additional features

ADXL346:

- 4- and 6-position orientation sensing

Configuration

Selectable ADXL34X I2C Device Address:

SDO	I2C Address
0	0x53
1	0x1D

Software configurable features

ADXL34x Linux Driver Features

ADXL345/346:

- Driver supports both SPI (3 and 4 wire) and I2C digital interface
  - I2C client using the 2.6 new style binding driver model
  - SPI using the generic Linux SPI Bus Driver Model
- Support for Linux Power Management (PM) suspend resume
- User selectable Sample Rate / Bandwidth trough sysfs hooks
- User selectable resolution

- Support for 32 level output data FIFO that minimizes host processor load
- Option to report acceleration as Linux Input Absolute or Relative events. (EV_ABS or EV_REL)
- Motion detection functions
  - Tap/Double Tap detection
    - User selectable Linux Input Event Codes for TAP_x,y,z axis
  - Activity/Inactivity monitoring
    - User selectable Linux Input Event Code for Activity/Inactivity reporting
    - Option to minimize host processor load and save additional power by automatically switch to sleep mode during periods of inactivity.
- Free-Fall detection
  - User selectable Linux Input Event Code for Free-Fall reporting

ADXL346:

- 4- and 6-position orientation sensing
  - User selectable Linux Input Event Code for individual positions

Source Code

Status

Status

Source	Mainlined?
git [http://git.kernel.org/?p=linux/kernel/git/torvalds/linux.git;a=blob;hb=HEAD;f=drivers/input/misc/adxl34x.c]	Yes [http://git.kernel.org/?p=linux/kernel/git/torvalds/linux.git;a=blob;hb=HEAD;f=drivers/input/misc/adxl34x.c]

Files

Function	File
driver	drivers/input/misc/adxl34x.c [http://git.kernel.org/?p=linux/kernel/git/torvalds/linux.git;a=blob;hb=HEAD;f=drivers/input/misc/adxl34x.c]
i2c bus support	drivers/input/misc/adxl34x-i2c.c [http://git.kernel.org/?p=linux/kernel/git/torvalds/linux.git;a=blob;hb=HEAD;f=drivers/input/misc/adxl34x-i2c.c]
spi bus support	drivers/input/misc/adxl34x-spi.c [http://git.kernel.org/?p=linux/kernel/git/torvalds/linux.git;a=blob;hb=HEAD;f=drivers/input/misc/adxl34x-spi.c]
include	include/linux/input/adxl34x.h [http://git.kernel.org/?p=linux/kernel/git/torvalds/linux.git;a=blob;hb=HEAD;f=include/linux/input/adxl34x.h]

ADXL345/6 driver porting

Starting with linux-2.6.36 the ADXL34x driver is mainlined. If you are using an pre linux-2.6.36 kernel get the source from our repositories and add them to your kernel tree.

If you are using a kernel version **without the threaded irq capabilities (< 2.6.30) get there driver from here:**

- adxl34x.c [http://blackfin.uclinux.org/git/?p=linux-kernel;a=blob;f=drivers/input/misc/adxl34x.c;h=c67bb179f81642fe1bf403d132567098fd492dee;hb=b03acb9bcd06d8495f9c2510a593a2adf9919aaa;hb=HEAD]
  - Copy to linux-2.6.x/drivers/input/misc/adxl34x.c
- adxl34x.h [http://blackfin.uclinux.org/git/?p=linux-kernel;a=blob;f=drivers/input/misc/adxl34x.h;h=c67bb179f81642fe1bf403d132567098fd492dee;hb=b03acb9bcd06d8495f9c2510a593a2adf9919aaa;;hb=HEAD]
  - Copy to linux-2.6.x/drivers/input/misc/adxl34x.h
- adxl34x-i2c.c [http://blackfin.uclinux.org/git/?p=linux-kernel;a=blob;f=drivers/input/misc/adxl34x-i2c;h=c67bb179f81642fe1bf403d132567098fd492dee;hb=b03acb9bcd06d8495f9c2510a593a2adf9919aaa;hb=HEAD]
  - Copy to linux-2.6.x/drivers/input/misc/adxl34x-i2c.c
- adxl34x-spi.c [http://blackfin.uclinux.org/git/?p=linux-kernel;a=blob;f=drivers/input/misc/adxl34x-spi.c;h=c67bb179f81642fe1bf403d132567098fd492dee;hb=b03acb9bcd06d8495f9c2510a593a2adf9919aaa;hb=HEAD]
  - Copy to linux-2.6.x/drivers/input/misc/adxl34x-spi.c
- adxl34x.h [http://blackfin.uclinux.org/git/?p=linux-kernel;a=blob;f=include/linux/input/adxl34x.h;h=c67bb179f81642fe1bf403d132567098fd492dee;hb=b03acb9bcd06d8495f9c2510a593a2adf9919aaa;hb=HEAD]
  - Copy to linux-2.6.x/include/linux/input/adxl34x.h

For the latest version of checkout the Files section of this document.

Add following lines to *linux-2.6.x/drivers/input/misc/Kconfig*:

```
config INPUT_ADXL34X
        tristate "Analog Devices ADXL34x Three-Axis Digital Accelerometer"
        default n
        help
          Say Y here if you have a Accelerometer interface using the
          ADXL345/6 controller, and your board-specific initialization
          code includes that in its table of devices.

          This driver can use either I2C or SPI communication to the
          ADXL345/6 controller.  Select the appropriate method for
          your system.
```

```
          If unsure, say N (but it's safe to say "Y").

          To compile this driver as a module, choose M here: the
          module will be called adxl34x.

config INPUT_ADXL34X_I2C
        tristate "support I2C bus connection"
        depends on INPUT_ADXL34X && I2C
        default y
        help
          Say Y here if you have ADXL345/6 hooked to an I2C bus.

          To compile this driver as a module, choose M here: the
          module will be called adxl34x-i2c.

config INPUT_ADXL34X_SPI
        tristate "support SPI bus connection"
        depends on INPUT_ADXL34X && SPI
        default y
        help
          Say Y here if you have ADXL345/6 hooked to a SPI bus.

          To compile this driver as a module, choose M here: the
          module will be called adxl34x-spi.
```

Add following lines to *linux-2.6.x/drivers/input/misc/Makefile*:

```
obj-$(CONFIG_INPUT_ADXL34X)             += adxl34x.o
obj-$(CONFIG_INPUT_ADXL34X_I2C)         += adxl34x-i2c.o
obj-$(CONFIG_INPUT_ADXL34X_SPI)         += adxl34x-spi.o
```

Example platform device initialization

For compile time configuration, it’s common Linux practice to keep board- and application-specific configuration out of the main driver file, instead putting it into the board support file.

For devices on custom boards, as typical of embedded and SoC-(system-on-chip) based hardware, Linux uses platform_data to point to board-specific structures describing devices and how they are connected to the SoC. This can include available ports, chip variants, preferred modes, default initialization, additional pin roles, and so on. This shrinks the board-support packages (BSPs) and minimizes board and application specific #ifdefs in drivers.

21 Oct 2010 16:10 · Michael Hennerich

Digital Accelerometer characteristics are highly application specific and may vary between boards and models. The platform_data for the device's “struct device” holds this information.

```
/*
 * include/linux/input/adxl34x.h
 *
 * Digital Accelerometer characteristics are highly application specific
 * and may vary between boards and models. The platform_data for the
 * device's "struct device" holds this information.
 *
 * Copyright 2009 Analog Devices Inc.
 *
 * Licensed under the GPL-2 or later.
 */

#ifndef __LINUX_INPUT_ADXL34X_H__
#define __LINUX_INPUT_ADXL34X_H__

struct adxl34x_platform_data {

        /*
         * X,Y,Z Axis Offset:
         * offer user offset adjustments in twoscompliment
         * form with a scale factor of 15.6 mg/LSB (i.e. 0x7F = +2 g)
         */

        s8 x_axis_offset;
        s8 y_axis_offset;
        s8 z_axis_offset;

        /*
         * TAP_X/Y/Z Enable: Setting TAP_X, Y, or Z Enable enables X,
         * Y, or Z participation in Tap detection. A '0' excludes the
         * selected axis from participation in Tap detection.
         * Setting the SUPPRESS bit suppresses Double Tap detection if
         * acceleration greater than tap_threshold is present during the
         * tap_latency period, i.e. after the first tap but before the
         * opening of the second tap window.
         */

#define ADXL_SUPPRESS   (1 << 3)
#define ADXL_TAP_X_EN   (1 << 2)
#define ADXL_TAP_Y_EN   (1 << 1)
#define ADXL_TAP_Z_EN   (1 << 0)

        u8 tap_axis_control;

        /*
         * tap_threshold:
         * holds the threshold value for tap detection/interrupts.
         * The data format is unsigned. The scale factor is 62.5 mg/LSB
         * (i.e. 0xFF = +16 g). A zero value may result in undesirable
         * behavior if Tap/Double Tap is enabled.
         */

        u8 tap_threshold;
```

```
        /*
         * tap_duration:
         * is an unsigned time value representing the maximum
         * time that an event must be above the tap_threshold threshold
         * to qualify as a tap event. The scale factor is 625 us/LSB. A zero
         * value will prevent Tap/Double Tap functions from working.
         */

        u8 tap_duration;

        /*
         * tap_latency:
         * is an unsigned time value representing the wait time
         * from the detection of a tap event to the opening of the time
         * window tap_window for a possible second tap event. The scale
         * factor is 1.25 ms/LSB. A zero value will disable the Double Tap
         * function.
         */

        u8 tap_latency;

        /*
         * tap_window:
         * is an unsigned time value representing the amount
         * of time after the expiration of tap_latency during which a second
         * tap can begin. The scale factor is 1.25 ms/LSB. A zero value will
         * disable the Double Tap function.
         */

        u8 tap_window;

        /*
         * act_axis_control:
         * X/Y/Z Enable: A '1' enables X, Y, or Z participation in activity
         * or inactivity detection. A '0' excludes the selected axis from
         * participation. If all of the axes are excluded, the function is
         * disabled.
         * AC/DC: A '0' = DC coupled operation and a '1' = AC coupled
         * operation. In DC coupled operation, the current acceleration is
         * compared with activity_threshold and inactivity_threshold directly
         * to determine whether activity or inactivity is detected. In AC
         * coupled operation for activity detection, the acceleration value
         * at the start of activity detection is taken as a reference value.
         * New samples of acceleration are then compared to this
         * reference value and if the magnitude of the difference exceeds
         * activity_threshold the device will trigger an activity interrupt. In
         * AC coupled operation for inactivity detection, a reference value
         * is used again for comparison and is updated whenever the
         * device exceeds the inactivity threshold. Once the reference
         * value is selected, the device compares the magnitude of the
         * difference between the reference value and the current
         * acceleration with inactivity_threshold. If the difference is below
         * inactivity_threshold for a total of inactivity_time, the device is
         * considered inactive and the inactivity interrupt is triggered.
         */

#define ADXL_ACT_ACDC           (1 << 7)
#define ADXL_ACT_X_EN           (1 << 6)
#define ADXL_ACT_Y_EN           (1 << 5)
#define ADXL_ACT_Z_EN           (1 << 4)
#define ADXL_INACT_ACDC         (1 << 3)
#define ADXL_INACT_X_EN         (1 << 2)
#define ADXL_INACT_Y_EN         (1 << 1)
#define ADXL_INACT_Z_EN         (1 << 0)

        u8 act_axis_control;

        /*
         * activity_threshold:
         * holds the threshold value for activity detection.
         * The data format is unsigned. The scale factor is
         * 62.5 mg/LSB. A zero value may result in undesirable behavior if
         * Activity interrupt is enabled.
         */

        u8 activity_threshold;

        /*
         * inactivity_threshold:
         * holds the threshold value for inactivity
         * detection. The data format is unsigned. The scale
         * factor is 62.5 mg/LSB. A zero value may result in undesirable
         * behavior if Inactivity interrupt is enabled.
         */

        u8 inactivity_threshold;

        /*
         * inactivity_time:
         * is an unsigned time value representing the
         * amount of time that acceleration must be below the value in
         * inactivity_threshold for inactivity to be declared. The scale factor
         * is 1 second/LSB. Unlike the other interrupt functions, which
         * operate on unfiltered data, the inactivity function operates on the
         * filtered output data. At least one output sample must be
         * generated for the inactivity interrupt to be triggered. This will
         * result in the function appearing un-responsive if the
         * inactivity_time register is set with a value less than the time
         * constant of the Output Data Rate. A zero value will result in an
         * interrupt when the output data is below inactivity_threshold.
         */

        u8 inactivity_time;
```

```
        /*
         * free_fall_threshold:
         * holds the threshold value for Free-Fall detection.
         * The data format is unsigned. The root-sum-square(RSS) value
         * of all axes is calculated and compared to the value in
         * free_fall_threshold to determine if a free fall event may be
         * occurring.  The scale factor is 62.5 mg/LSB. A zero value may
         * result in undesirable behavior if Free-Fall interrupt is
         * enabled. Values between 300 and 600 mg (0x05 to 0x09) are
         * recommended.
         */

        u8 free_fall_threshold;

        /*
         * free_fall_time:
         * is an unsigned time value representing the minimum
         * time that the RSS value of all axes must be less than
         * free_fall_threshold to generate a Free-Fall interrupt. The
         * scale factor is 5 ms/LSB. A zero value may result in
         * undesirable behavior if Free-Fall interrupt is enabled.
         * Values between 100 to 350 ms (0x14 to 0x46) are recommended.
         */

        u8 free_fall_time;

        /*
         * data_rate:
         * Selects device bandwidth and output data rate.
         * RATE = 3200 Hz / (2^(15 - x)). Default value is 0x0A, or 100 Hz
         * Output Data Rate. An Output Data Rate should be selected that
         * is appropriate for the communication protocol and frequency
         * selected. Selecting too high of an Output Data Rate with a low
         * communication speed will result in samples being discarded.
         */

        u8 data_rate;

        /*
         * data_range:
         * FULL_RES: When this bit is set with the device is
         * in Full-Resolution Mode, where the output resolution increases
         * with RANGE to maintain a 4 mg/LSB scale factor. When this
         * bit is cleared the device is in 10-bit Mode and RANGE determine the
         * maximum g-Range and scale factor.
         */

#define ADXL_FULL_RES           (1 << 3)
#define ADXL_RANGE_PM_2g        0
#define ADXL_RANGE_PM_4g        1
#define ADXL_RANGE_PM_8g        2
#define ADXL_RANGE_PM_16g       3

        u8 data_range;

        /*
         * low_power_mode:
         * A '0' = Normal operation and a '1' = Reduced
         * power operation with somewhat higher noise.
         */

        u8 low_power_mode;

        /*
         * power_mode:
         * LINK: A '1' with both the activity and inactivity functions
         * enabled will delay the start of the activity function until
         * inactivity is detected. Once activity is detected, inactivity
         * detection will begin and prevent the detection of activity. This
         * bit serially links the activity and inactivity functions. When '0'
         * the inactivity and activity functions are concurrent. Additional
         * information can be found in the ADXL34x datasheet's Application
         * section under Link Mode.
         * AUTO_SLEEP: A '1' sets the ADXL34x to switch to Sleep Mode
         * when inactivity (acceleration has been below inactivity_threshold
         * for at least inactivity_time) is detected and the LINK bit is set.
         * A '0' disables automatic switching to Sleep Mode. See the
         * Sleep Bit section of the ADXL34x datasheet for more information.
         */

#define ADXL_LINK       (1 << 5)
#define ADXL_AUTO_SLEEP (1 << 4)

        u8 power_mode;

        /*
         * fifo_mode:
         * BYPASS The FIFO is bypassed
         * FIFO   FIFO collects up to 32 values then stops collecting data
         * STREAM FIFO holds the last 32 data values. Once full, the FIFO's
         *        oldest data is lost as it is replaced with newer data
         *
         * DEFAULT should be ADXL_FIFO_STREAM
         */

#define ADXL_FIFO_BYPASS        0
#define ADXL_FIFO_FIFO          1
#define ADXL_FIFO_STREAM        2

        u8 fifo_mode;

        /*
         * watermark:
         * The Watermark feature can be used to reduce the interrupt load
```

```
         * of the system. The FIFO fills up to the value stored in watermark
         * [1..32] and then generates an interrupt.
         * A '0' disables the watermark feature.
         */

        u8 watermark;

        /*
         * When acceleration measurements are received from the ADXL34x
         * events are sent to the event subsystem. The following settings
         * select the event type and event code for new x, y and z axis data
         * respectively.
         */
        u32 ev_type;    /* EV_ABS or EV_REL */

        u32 ev_code_x;  /* ABS_X,Y,Z or REL_X,Y,Z */
        u32 ev_code_y;  /* ABS_X,Y,Z or REL_X,Y,Z */
        u32 ev_code_z;  /* ABS_X,Y,Z or REL_X,Y,Z */

        /*
         * A valid BTN or KEY Code; use tap_axis_control to disable
         * event reporting
         */

        u32 ev_code_tap[3];     /* EV_KEY {X-Axis, Y-Axis, Z-Axis} */

        /*
         * A valid BTN or KEY Code for Free-Fall or Activity enables
         * input event reporting. A '0' disables the Free-Fall or
         * Activity reporting.
         */

        u32 ev_code_ff; /* EV_KEY */
        u32 ev_code_act_inactivity;     /* EV_KEY */

        /*
         * Use ADXL34x INT2 pin instead of INT1 pin for interrupt output
         */
        u8 use_int2;

        /*
         * ADXL346 only ORIENTATION SENSING feature
         * The orientation function of the ADXL346 reports both 2-D and
         * 3-D orientation concurrently.
         */

#define ADXL_EN_ORIENTATION_2D          1
#define ADXL_EN_ORIENTATION_3D          2
#define ADXL_EN_ORIENTATION_2D_3D       3

        u8 orientation_enable;

        /*
         * The width of the deadzone region between two or more
         * orientation positions is determined by setting the Deadzone
         * value. The deadzone region size can be specified with a
         * resolution of 3.6deg. The deadzone angle represents the total
         * angle where the orientation is considered invalid.
         */

#define ADXL_DEADZONE_ANGLE_0p0         0       /* !!!0.0 [deg] */
#define ADXL_DEADZONE_ANGLE_3p6         1       /* 3.6 [deg] */
#define ADXL_DEADZONE_ANGLE_7p2         2       /* 7.2 [deg] */
#define ADXL_DEADZONE_ANGLE_10p8        3       /* 10.8 [deg] */
#define ADXL_DEADZONE_ANGLE_14p4        4       /* 14.4 [deg] */
#define ADXL_DEADZONE_ANGLE_18p0        5       /* 18.0 [deg] */
#define ADXL_DEADZONE_ANGLE_21p6        6       /* 21.6 [deg] */
#define ADXL_DEADZONE_ANGLE_25p2        7       /* 25.2 [deg] */

        u8 deadzone_angle;

        /*
         * To eliminate most human motion such as walking or shaking,
         * a Divisor value should be selected to effectively limit the
         * orientation bandwidth. Set the depth of the filter used to
         * low-pass filter the measured acceleration for stable
         * orientation sensing
         */

#define ADXL_LP_FILTER_DIVISOR_2        0
#define ADXL_LP_FILTER_DIVISOR_4        1
#define ADXL_LP_FILTER_DIVISOR_8        2
#define ADXL_LP_FILTER_DIVISOR_16       3
#define ADXL_LP_FILTER_DIVISOR_32       4
#define ADXL_LP_FILTER_DIVISOR_64       5
#define ADXL_LP_FILTER_DIVISOR_128      6
#define ADXL_LP_FILTER_DIVISOR_256      7

        u8 divisor_length;

        u32 ev_codes_orient_2d[4];      /* EV_KEY {+X, -X, +Y, -Y} */
        u32 ev_codes_orient_3d[6];      /* EV_KEY {+Z, +Y, +X, -X, -Y, -Z} */
};
#endif
```

Example Platform / Board file (SPI Interface Option)

Declaring SPI slave devices

Unlike PCI or USB devices, SPI devices are not enumerated at the hardware level. Instead, the software must know which devices are connected on each SPI bus

segment, and what slave selects these devices are using. For this reason, the kernel code must instantiate SPI devices explicitly. The most common method is to declare the SPI devices by bus number.

This method is appropriate when the SPI bus is a system bus, as in many embedded systems, wherein each SPI bus has a number which is known in advance. It is thus possible to pre-declare the SPI devices that inhabit this bus. This is done with an array of struct spi_board_info, which is registered by calling spi_register_board_info().

For more information see: Documentation/spi/spi-summary [http://git.kernel.org/?p=linux/kernel/git/torvalds/linux.git;a=blob;hb=HEAD;f=Documentation/spi/spi-summary]

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These snippets are all from the same file. `arch/blackfin/mach-bf548/boards/ezkit.c`:

```
#include <linux/spi/adxl34x.h>
```

```
#if defined(CONFIG_INPUT_ADXL34X) || defined(CONFIG_INPUT_ADXL34X_MODULE)
#include <linux/input/adxl34x.h>
static const struct adxl34x_platform_data adxl34x_info = {
        .x_axis_offset = 0,
        .y_axis_offset = 0,
        .z_axis_offset = 0,
        .tap_threshold = 0x31,
        .tap_duration = 0x10,
        .tap_latency = 0x60,
        .tap_window = 0xF0,
        .tap_axis_control = ADXL_TAP_X_EN | ADXL_TAP_Y_EN | ADXL_TAP_Z_EN,
        .act_axis_control = 0xFF,
        .activity_threshold = 5,
        .inactivity_threshold = 3,
        .inactivity_time = 4,
        .free_fall_threshold = 0x7,
        .free_fall_time = 0x20,
        .data_rate = 0x8,
        .data_range = ADXL_FULL_RES,

        .ev_type = EV_ABS,
        .ev_code_x = ABS_X,             /* EV_REL */
        .ev_code_y = ABS_Y,             /* EV_REL */
        .ev_code_z = ABS_Z,             /* EV_REL */

        .ev_code_tap = {BTN_TOUCH, BTN_TOUCH, BTN_TOUCH}, /* EV_KEY x,y,z */

/*      .ev_code_ff = KEY_F,*/          /* EV_KEY */
/*      .ev_code_act_inactivity = KEY_A,*/      /* EV_KEY */
        .power_mode = ADXL_AUTO_SLEEP | ADXL_LINK,
        .fifo_mode = ADXL_FIFO_STREAM,
        .orientation_enable = ADXL_EN_ORIENTATION_3D,
        .deadzone_angle = ADXL_DEADZONE_ANGLE_10p8,
        .divisor_length = ADXL_LP_FILTER_DIVISOR_16,
        /* EV_KEY {+Z, +Y, +X, -X, -Y, -Z} */
        .ev_codes_orient_3d = {BTN_Z, BTN_Y, BTN_X, BTN_A, BTN_B, BTN_C},
};
#endif
```

```
static struct spi_board_info board_spi_board_info[] __initdata = {
#if defined(CONFIG_INPUT_ADXL34X_SPI) || defined(CONFIG_INPUT_ADXL34X_SPI_MODULE)
        {
                .modalias               = "adxl34x",
                .platform_data          = &adxl34x_info,
                .irq                    = IRQ_XYZ,
                .max_speed_hz           = 5000000,     /* max spi clock (SCK) speed in HZ */
                .bus_num                = 1,
                .chip_select            = 2,
                .mode                   = SPI_MODE_3,
        },
#endif
};
```

```
static int __init board_init(void)
{
        [--snip--]

        spi_register_board_info(board_spi_board_info, ARRAY_SIZE(board_spi_board_info));

        [--snip--]

        return 0;
}
arch_initcall(board_init);
```

Devicetree

Required devicetree properties:

- compatible: Needs to be "adi," followed by the name of the device. E.g. "adi,adxl34x"
- reg: The chipselect number used for the device
- spi-max-frequency: Maximum SPI clock frequency
- spi-cpha: Needs to be set for the correct SPI mode
- spi-cpol: Needs to be set for the correct SPI mode
- interrupt-parent: Specifies which IRQ controller is used
- interrupts: The interrupt associated with the INT2 pin

```
    axi_spi_1: spi@42040000 {
            #address-cells = <1>;
```

```
                #size-cells = <0>;
                compatible = "xlnx,axi-spi-1.02.a", "xlnx,xps-spi-2.00.a";
                ...

                adxl345@0 {
                        compatible = "adi,adxl34x";
                        reg = <0>;
                        spi-max-frequency = <1000000>;
                        spi-cpha;
                        spi-cpol;
                        interrupt-parent = <&gic>;
                        interrupts = < 0 32 4 >;
                };
        };
```

Example Platform / Board file (I2C Interface Option)

Declaring I2C devices

Unlike PCI or USB devices, I2C devices are not enumerated at the hardware level. Instead, the software must know which devices are connected on each I2C bus segment, and what address these devices are using. For this reason, the kernel code must instantiate I2C devices explicitly. There are different ways to achieve this, depending on the context and requirements. However the most common method is to declare the I2C devices by bus number.

This method is appropriate when the I2C bus is a system bus, as in many embedded systems, wherein each I2C bus has a number which is known in advance. It is thus possible to pre-declare the I2C devices that inhabit this bus. This is done with an array of struct i2c_board_info, which is registered by calling i2c_register_board_info().

So, to enable such a driver one need only edit the board support file by adding an appropriate entry to i2c_board_info.

For more information see: Documentation/i2c/instantiating-devices [http://git.kernel.org/?p=linux/kernel/git/torvalds/linux.git;a=blob;hb=HEAD;f=Documentation/i2c/instantiating-devices]

21 Oct 2010 16:10 · Michael Hennerich

These snippets are all from the same file. `arch/blackfin/mach-bf548/boards/ezkit.c`:

```
static struct i2c_board_info __initdata board_i2c_board_info[] = {
#if defined(CONFIG_INPUT_ADXL34X_I2C) || defined(CONFIG_INPUT_ADXL34X_I2C_MODULE)
        {
                I2C_BOARD_INFO("adxl34x", 0x53),
                .irq = IRQ_XYZ,
                .platform_data = (void *)&adxl34x_info,
        },
#endif
};
```

```
static int __init board_init(void)
{
        [--snip--]

        i2c_register_board_info(0, board_i2c_board_info,
                                ARRAY_SIZE(board_i2c_board_info));
        [--snip--]

        return 0;
}
arch_initcall(board_init);
```

Devicetree

Required devicetree properties:

- compatible: Needs to be “adi,” followed by the name of the device. E.g. “adi,adxl34x”
- reg: The slave address of the device
- interrupt-parent: Specifies which IRQ controller is used
- interrupts: The interrupt associated with the INT2 pin

```
    axi_iic_1: i2c@41640000 {
            #address-cells = <1>;
            #size-cells = <0>;
            compatible = "xlnx,axi-iic-1.02.a", "xlnx,xps-iic-2.00.a";
            ...

            adxl345@0 {
                    compatible = "adi,adxl34x";
                    reg = <0x53>;
                    interrupt-parent = <&gic>;
                    interrupts = < 0 32 4 >;
            };
    };
```

Adding Linux driver support

Configure kernel with “make menuconfig” (alternatively use “make xconfig” or “make qconfig”)

The ADXL34x Driver depends on **CONFIG_SPI** or **CONFIG_I2C**

```
Input device support
  -*- Generic input layer (needed for keyboard, mouse, ...)
  < >   Support for memoryless force-feedback devices
  < >   Polled input device skeleton
  < >   Sparse keymap support library
        *** Userland interfaces ***
  < >   Mouse interface
  < >   Joystick interface
  <*>   Event interface
  < >   Event debugging
        *** Input Device Drivers ***
  [ ]   Keyboards  --->
  [ ]   Mice  --->
  [ ]   Joysticks/Gamepads  --->
  [ ]   Tablets  --->
  [ ]   Touchscreens  --->
  [*]   Miscellaneous devices  --->
         < >   Analog Devices AD714x Capacitance Touch Sensor
         <*>   Analog Devices ADXL34x Three-Axis Digital Accelerometer
         <*>     support I2C bus connection (NEW)
         <*>     support SPI bus connection (NEW)
        Hardware I/O ports  --->
```

Hardware configuration

Driver testing

Driver compiled as a module

I2C Interface:

```
root:~> modprobe evdev
root:~> modprobe adxl34x
input: ADXL34x accelerometer as /devices/platform/i2c-bfin-twi.1/i2c-adapter/i2c-1/1-0053/input/input1
adxl34x 1-0053: ADXL345 accelerometer, irq 140
```

SPI Interface:

```
root:~> modprobe evdev
root:~> modprobe adxl34x
input: ADXL34x accelerometer as /devices/platform/bfin-spi.1/spi1.2/input/input1
adxl34x spi1.2: ADXL345 accelerometer, irq 140
```

Driver compiled into the kernel

Your kernel startup messages should include something like this

I2C Interface:

```
input: ADXL34x accelerometer as /devices/platform/i2c-bfin-twi.1/i2c-adapter/i2c-1/1-0053/input/input1
adxl34x 1-0053: ADXL345 accelerometer, irq 140
```

SPI Interface:

```
input: ADXL34x accelerometer as /devices/platform/bfin-spi.1/spi1.2/input/input1
adxl34x spi1.2: ADXL345 accelerometer, irq 140
```

Common Problems

In case you see a message like this

```
adxl34x spi1.2: Failed to probe ADXL34x accelerometer
```

This means that the SPI communication and initilaization with the ADXL34x failed. **check bus_num and chip_select in your platform device file**

Checking for proper installation

After the kernel boot your device folder should include at least one device node for the accelerometer

```
root:/> ls -al /dev/input/
drw-r--r--    2 root     root            0 Jan  1 00:03 .
drwxr-xr-x    5 root     root            0 Jan  1 00:03 ..
crw-rw-r--    1 root     root      13,  64 Jan  1 00:03 event0
crw-rw-r--    1 root     root      13,  65 Jan  1 00:03 event1
root:/>
```

Check that the interrupt is registered.

```
root:~> cat /proc/interrupts | grep adxl34x
140:          0   adxl34x

root:~> cat /sys/class/input/input1/name
ADXL34x accelerometer
```

Use the evtest utility to test proper function

```
root:/> evtest /dev/input/event1
```

```
Input driver version is 1.0.0
Input device ID: bus 0x18 vendor 0x0 product 0x159 version 0x0
Input device name: "ADXL34x accelerometer"
Supported events:
  Event type 0 (Reset)
    Event code 0 (Reset)
    Event code 1 (Key)
    Event code 3 (Absolute)
  Event type 1 (Key)
    Event code 330 (Touch)
  Event type 3 (Absolute)
    Event code 0 (X)
      Value     15
      Min    -4096
      Max     4096
      Fuzz       3
      Flat       3
    Event code 1 (Y)
      Value    -15
      Min    -4096
      Max     4096
      Fuzz       3
      Flat       3
    Event code 2 (Z)
      Value    242
      Min    -4096
      Max     4096
      Fuzz       3
      Flat       3
Testing ... (interrupt to exit)
Event: time 107831.548000, type 3 (Absolute), code 0 (X), value -7
Event: time 107831.548000, type 3 (Absolute), code 1 (Y), value -2
Event: time 107831.548000, type 3 (Absolute), code 2 (Z), value 12
Event: time 107831.548000, type 0 (Reset), code 0 (Reset), value 0
Event: time 107831.588000, type 3 (Absolute), code 0 (X), value -17
Event: time 107831.588000, type 3 (Absolute), code 1 (Y), value 4
Event: time 107831.588000, type 0 (Reset), code 0 (Reset), value 0
Event: time 107831.632000, type 3 (Absolute), code 0 (X), value -16
Event: time 107831.632000, type 3 (Absolute), code 2 (Z), value 11
```

In case you move the accelerometer and don't receive events, it's likely that something with your Interrupt is wrong.
check irq number in your platform device file

In case you get a message like: `evtest: No such device`, it's likely that you have not install the necessary modules

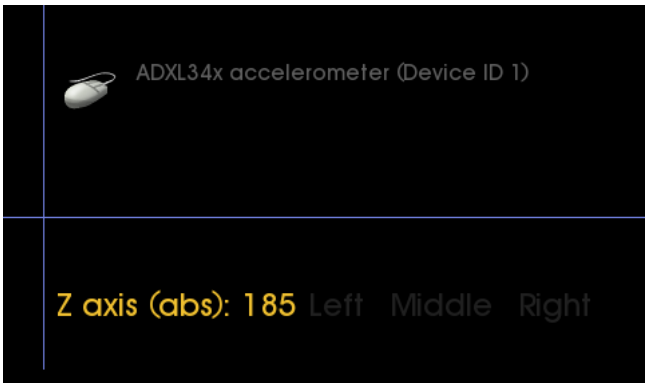
Visualizing Linux Input Events using df_input example from DirectFB

```
root:/> df_input &

    ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        (c) 2001-2008  The world wide DirectFB Open Source Community
        (c) 2000-2004  Convergence (integrated media) GmbH
      ------------------------------------------------------------------

(*) DirectFB/Core: Single Application Core. (2009-05-27 15:03)
[1] 401 df_input
root:/> (*) Direct/Thread: Started 'VT Switcher' (405) [CRITICAL OTHER/OTHER 0/0] <12288>...
(*) Direct/Thread: Started 'Keyboard Input' (406) [INPUT OTHER/OTHER 0/0] <12288>...
(*) DirectFB/Input: Keyboard 0.9 (directfb.org)
(*) Direct/Thread: Started 'Linux Input' (407) [INPUT OTHER/OTHER 0/0] <12288>...
(*) DirectFB/Input: bf54x-keys (1) 0.1 (directfb.org)
(*) Direct/Thread: Started 'Linux Input' (408) [INPUT OTHER/OTHER 0/0] <12288>...
(*) DirectFB/Input: ADXL34x accelerometer (2) 0.1 (directfb.org)
(*) DirectFB/Graphics: Generic Software Rasterizer 0.6 (directfb.org)
(*) DirectFB/Core/WM: Default 0.3 (directfb.org)
(*) FBDev/Surface: Allocated 480x272 24 bit RGB24 buffer (index 0) at offset 0 and pitch 1440.
(*) FBDev/Surface: Allocated 480x272 24 bit RGB24 buffer (index 0) at offset 0 and pitch 1440.
(*) Direct/Interface: Loaded 'FT2' implementation of 'IDirectFBFont'.
(*) Direct/Interface: Loaded 'PNG' implementation of 'IDirectFBImageProvider'.

root:/>
```



ADXL34x Sysfs runtime controls

```
root:/> cd sys/class/input/input1/device/
root:/sys/devices/platform/bfin-spi.1/spi1.2> ls -al
drwxr-xr-x    3 root     root            0 Jan  2 10:39 .
drwxr-xr-x    4 root     root            0 Jan  2 10:39 ..
-rw-rw-r--    1 root     root         4096 Jan  2 12:01 autosleep
-rw-rw-r--    1 root     root         4096 Jan  2 12:01 calibrate
-rw-rw-r--    1 root     root         4096 Jan  2 12:01 disable
lrwxrwxrwx    1 root     root            0 Jan  2 12:01 driver -> ../../../../bus/spi/drivers/adxl34x
drwxr-xr-x    3 root     root            0 Jan  2 10:39 input
-r--r--r--    1 root     root         4096 Jan  2 12:01 modalias
-rw-rw-r--    1 root     root         4096 Jan  2 12:01 rate
lrwxrwxrwx    1 root     root            0 Jan  2 12:01 subsystem -> ../../../../bus/spi
-rw-r--r--    1 root     root         4096 Jan  2 12:01 uevent
root:/sys/devices/platform/bfin-spi.1/spi1.2>
```

Device Calibration

```
root:/sys/devices/platform/bfin-spi.1/spi1.2> echo 1 > calibrate
root:/sys/devices/platform/bfin-spi.1/spi1.2> cat calibrate
2,10,-204
```

Controlling the Output Data Rate

Output Data Rate (Hz)	Bandwidth (Hz)	Value
3200	1600	15
1600	800	14
800	400	13
400	200	12
200	100	11
100	50	10
50	25	9
25	12.5	8
12.5	6.25	7
6.25	3.125	6
3.125	1.563	5
1.563	0.782	4
0.782	0.39	3
0.39	0.195	2
0.195	0.098	1
0.098	0.048	0

Writing '**value**' into **rate** sets the desired sample rate
Reading **rate** returns the current value

See table above for supported sample rates

```
root:/sys/devices/platform/bfin-spi.1/spi1.2> echo 8 > rate
root:/sys/devices/platform/bfin-spi.1/spi1.2> cat rate
8
```

> **Be aware:** The ADXL34x conforms to The I2C Bus Specification, Version 2.1, January 2000, available from Phillips Semiconductor. It supports standard (100 kHz) and fast (400 kHz) data transfer modes.
>
> Very high output data rates are only possible via fast I2C (400kHz) or the SPI interface.

Enabling / Disabling the Device

Writing '**1**' into disable - disables the ADXL34x (low power suspend mode)

Writing '**0**' into disable - enables the ADXL34x

```
root:/sys/devices/platform/bfin-spi.1/spi1.2> echo 1 > disable
root:/sys/devices/platform/bfin-spi.1/spi1.2> echo 0 > disable
root:/sys/devices/platform/bfin-spi.1/spi1.2>
```

Enabling / Disabling Autosleep Upon Inactivity

Writing '**1**' into autosleep - enables Autosleep Upon Inactivity
Writing '**0**' into autosleep - disables Autosleep Upon Inactivity

```
root:/sys/devices/platform/bfin-spi.1/spi1.2> echo 1 > autosleep
root:/sys/devices/platform/bfin-spi.1/spi1.2> echo 0 > autosleep
root:/sys/devices/platform/bfin-spi.1/spi1.2>
```

ADXL345 on Raspberry Pi - A worked example

Create an SD Card image

Download Raspbian "wheezy" SD Card Image from here: http://www.raspberrypi.org/downloads [http://www.raspberrypi.org/downloads]

> This example assumes that /dev/sdc is the SD-Card reader.
> All content will be lost!

This specifies any shell prompt running on the target

```
Dave@HAL9000:~/devel/pshare/RaspberryPi$ unzip 2012-08-16-wheezy-raspbian.zip
Archive:  2012-08-16-wheezy-raspbian.zip
  inflating: 2012-08-16-wheezy-raspbian.img

Dave@HAL9000:~/devel/pshare/RaspberryPi$ sudo dd bs=1M if=2012-08-16-wheezy-raspbian.img of=/dev/sdc
[sudo] password for michael:
1850+0 records in
1850+0 records out
1939865600 bytes (1.9 GB) copied, 434.764 s, 4.5 MB/s
Dave@HAL9000:~/devel/pshare/RaspberryPi$
```

Compile a kernel

There are two ways to compile a new Kernel -

- On the target itself
- On a development computer (host)

> In order to speed things up - we compile the kernel on a foreign host.

Get ARM tools and RaspberryPi kernel source

Create an empty directory

This specifies any shell prompt running on the target

```
Dave@HAL9000:~/devel/git$ mkdir RaspberryPi
Dave@HAL9000:~/devel/git$ cd RaspberryPi
```

Get tools

This specifies any shell prompt running on the target

```
Dave@HAL9000:~/devel/git/RaspberryPi$ git clone https://github.com/raspberrypi/tools.git
Initialized empty Git repository in /home/michael/devel/git/RaspberryPi/tools/.git/
remote: Counting objects: 11148, done.
remote: Compressing objects: 100% (5752/5752), done.
remote: Total 11148 (delta 6433), reused 9628 (delta 4913)
Receiving objects: 100% (11148/11148), 219.74 MiB | 359 KiB/s, done.
Resolving deltas: 100% (6433/6433), done.
Checking out files: 100% (10692/10692), done.
```

Get Kernel Source

This specifies any shell prompt running on the target

```
Dave@HAL9000:~/devel/git/RaspberryPi$ git clone https://github.com/raspberrypi/linux.git
Initialized empty Git repository in /home/michael/devel/git/RaspberryPi/linux/.git/
remote: Counting objects: 2287525, done.
remote: Compressing objects: 100% (360373/360373), done.
remote: Total 2287525 (delta 1911472), reused 2276887 (delta 1905269)
Receiving objects: 100% (2287525/2287525), 468.96 MiB | 566 KiB/s, done.
Resolving deltas: 100% (1911472/1911472), done.
Checking out files: 100% (37972/37972), done.
Dave@HAL9000:~/devel/git/RaspberryPi$
```

See here: http://elinux.org/RPi_Kernel_Compilation [http://elinux.org/RPi_Kernel_Compilation]

Download and apply patches

Get patch files here:

- adxl34x_raspberrypi_patches.zip

This was tested with the Raspberry Pi Model B, PCB Version 2 (made in UK)

The primary and secondary I2C channels have been reversed.

You may need to register i2c board info for Bus-0 instead of Bus-1.

```
/* From arch/arm/mach-bcm2708/bcm2708.c */

#ifdef CONFIG_I2C
        i2c_register_board_info(0, bcm2708_i2c_board_info,
                                ARRAY_SIZE(bcm2708_i2c_board_info));
#endif
```

This specifies any shell prompt running on the target

```
Dave@HAL9000:~/devel/git/RaspberryPi/linux$ git am 0001-input-adxl34x-quick-hack-for-BCM2807-which-doesn-t-s.patch
Applying: input: adxl34x: quick hack for BCM2807 which doesn't support level sensitive interrupts


Dave@HAL9000:~/devel/git/RaspberryPi/linux$ git am 0002-platform-RaspberryPi-provide-i2c-board-info-for-ADXL.patch
Applying: platform: RaspberryPi: provide i2c board info for ADXL345 Accelerometer.
Dave@HAL9000:~/devel/git/RaspberryPi/linux$
```

Add ARM toolchain to the PATH variable and set ARCH and CROSS_COMPILE

This specifies any shell prompt running on the target

```
Dave@HAL9000:~/devel/git/RaspberryPi/linux$ export PATH=/home/michael/devel/git/RaspberryPi/tools/arm-bcm2708/gcc-linaro-arm-linux-gnue
Dave@HAL9000:~/devel/git/RaspberryPi/linux$ export ARCH=arm
Dave@HAL9000:~/devel/git/RaspberryPi/linux$ export CROSS_COMPILE=arm-linux-gnueabihf-
```

Load kernel config for bcmrpi

This specifies any shell prompt running on the target

```
Dave@HAL9000:~/devel/git/RaspberryPi/linux$ make bcmrpi_defconfig
#
# configuration written to .config
#
```

Now build your kernel

This specifies any shell prompt running on the target

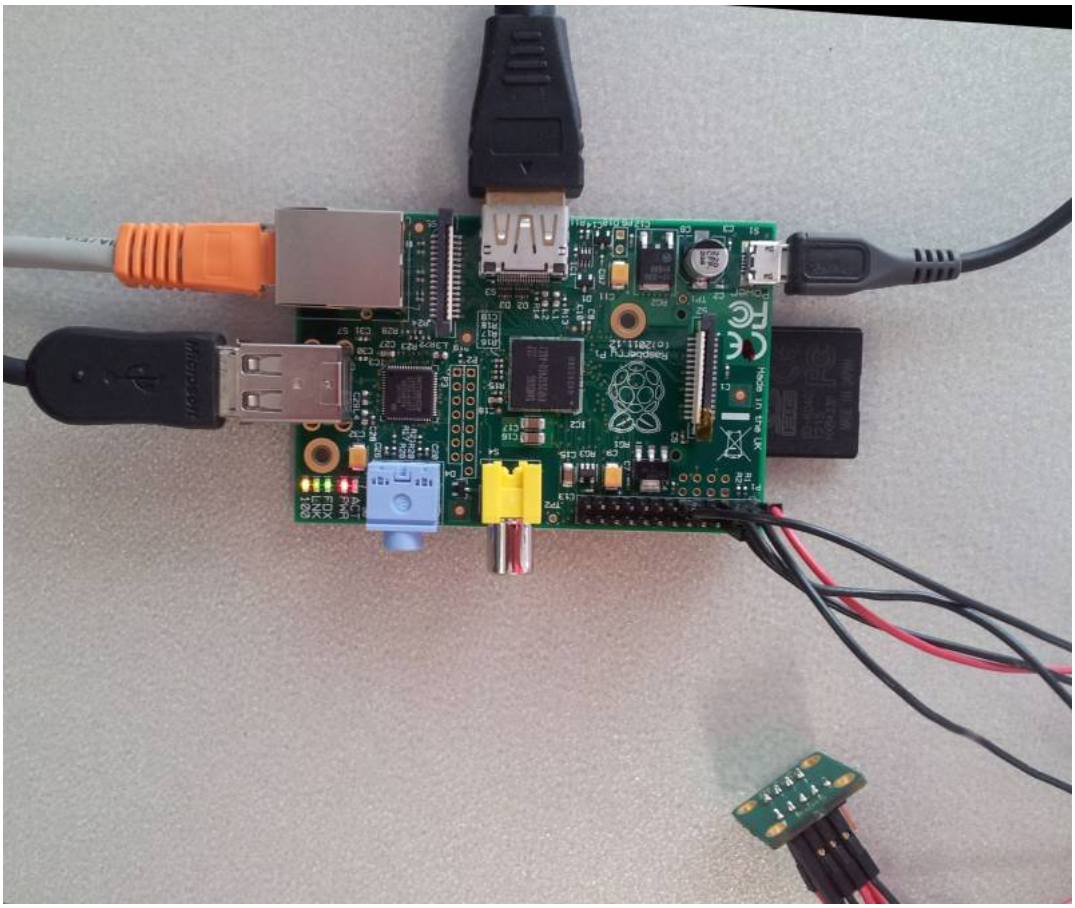
```
Dave@HAL9000:~/devel/git/RaspberryPi/linux$ make -j5
```

Copy kernel image and modules to SD Card

This specifies any shell prompt running on the target

```
Dave@HAL9000:~/devel/git/RaspberryPi/linux$ cp arch/arm/boot/zImage /media/A1B1-918F/kernel.img
Dave@HAL9000:~/devel/git/RaspberryPi/linux$ sudo ARCH=arm make modules_install INSTALL_MOD_PATH=/media/10b4c001-2137-4418-b29e-57b7d15a
```

Connect ADXL345 development Board



http://elinux.org/RPi_Low-level_peripherals [http://elinux.org/RPi_Low-level_peripherals]

Connect ADXL345 SDA, SCL and INT1 to the RaspberryPi GPIO header P1

Power up your Raspberry Pi

Load the I2C Bus driver module

This specifies any shell prompt running on the target

```
pi@raspberrypi ~ $ sudo modprobe i2c-bcm2708
```

Check if ADXL345 was successfully probed / instantiated

This specifies any shell prompt running on the target

```
pi@raspberrypi ~ $ dmesg | grep ADXL
[   44.858034] input: ADXL34x accelerometer as /devices/platform/bcm2708_i2c.1/i2c-1/1-0053/input/input2
pi@raspberrypi ~ $
```

Get evtest tool

This specifies any shell prompt running on the target

```
pi@raspberrypi ~ $ sudo apt-get install evtest
```

Driver test

This specifies any shell prompt running on the target

```
pi@raspberrypi ~ $ evtest /dev/input/event2
Input driver version is 1.0.1
Input device ID: bus 0x18 vendor 0x0 product 0x159 version 0x0
Input device name: "ADXL34x accelerometer"
Supported events:
  Event type 0 (EV_SYN)
  Event type 1 (EV_KEY)
    Event code 330 (BTN_TOUCH)
  Event type 3 (EV_ABS)
    Event code 0 (ABS_X)
      Value     43
      Min    -4096
      Max     4096
      Fuzz       3
      Flat       3
    Event code 1 (ABS_Y)
      Value     -9
      Min    -4096
      Max     4096
      Fuzz       3
      Flat       3
    Event code 2 (ABS_Z)
      Value     52
      Min    -4096
      Max     4096
      Fuzz       3
      Flat       3
Properties:
Testing ... (interrupt to exit)
Event: time 1345080074.937061, type 3 (EV_ABS), code 0 (ABS_X), value 188
Event: time 1345080074.937065, type 3 (EV_ABS), code 1 (ABS_Y), value -136
Event: time 1345080074.937066, type 3 (EV_ABS), code 2 (ABS_Z), value 106
Event: time 1345080074.937069, -------------- SYN_REPORT ------------
Event: time 1345080074.976842, type 3 (EV_ABS), code 0 (ABS_X), value 197
Event: time 1345080074.976847, type 3 (EV_ABS), code 1 (ABS_Y), value -134
Event: time 1345080074.976848, type 3 (EV_ABS), code 2 (ABS_Z), value 112
Event: time 1345080074.976850, -------------- SYN_REPORT ------------
Event: time 1345080075.016672, type 3 (EV_ABS), code 0 (ABS_X), value 188
Event: time 1345080075.016676, type 3 (EV_ABS), code 1 (ABS_Y), value -133
Event: time 1345080075.016677, type 3 (EV_ABS), code 2 (ABS_Z), value 110
Event: time 1345080075.016679, -------------- SYN_REPORT ------------
Event: time 1345080075.056513, type 3 (EV_ABS), code 0 (ABS_X), value 189
Event: time 1345080075.056516, type 3 (EV_ABS), code 1 (ABS_Y), value -131
Event: time 1345080075.056518, type 3 (EV_ABS), code 2 (ABS_Z), value 99
Event: time 1345080075.056520, -------------- SYN_REPORT ------------
Event: time 1345080075.096264, type 3 (EV_ABS), code 0 (ABS_X), value 188
Event: time 1345080075.096267, type 3 (EV_ABS), code 1 (ABS_Y), value -125
Event: time 1345080075.096269, -------------- SYN_REPORT ------------
```

This specifies any shell prompt running on the target

```
pi@raspberrypi ~ $ cat /proc/interrupts
           CPU0
  3:       9183   ARMCTRL  BCM2708 Timer Tick
 52:        784   ARMCTRL  BCM2708 GPIO catchall handler
 65:          2   ARMCTRL  ARM Mailbox IRQ
 66:          1   ARMCTRL  VCHIQ doorbell
 75:    2615599   ARMCTRL  dwc_otg, dwc_otg_pcd, dwc_otg_hcd:usb1
 77:       9041   ARMCTRL  bcm2708_sdhci (dma)
 79:       9469   ARMCTRL  bcm2708_i2c.0, bcm2708_i2c.1
 83:         20   ARMCTRL  uart-pl011
 84:      14411   ARMCTRL  mmc0
187:        784      GPIO  1-0053
Err:          0
```

This specifies any shell prompt running on the target

```
pi@raspberrypi /sys/bus/i2c/devices/1-0053 $ ls -l
total 0
-rw-rw-r-- 1 root root 4096 Aug 16 01:22 autosleep
-rw-rw-r-- 1 root root 4096 Aug 16 01:22 calibrate
-rw-rw-r-- 1 root root 4096 Aug 16 01:22 disable
lrwxrwxrwx 1 root root    0 Aug 16 01:22 driver -> ../../../../../bus/i2c/drivers/adxl34x
drwxr-xr-x 3 root root    0 Aug 16 01:22 input
-r--r--r-- 1 root root 4096 Aug 16 01:22 modalias
-r--r--r-- 1 root root 4096 Aug 16 01:22 name
-r--r--r-- 1 root root 4096 Aug 16 01:22 position
drwxr-xr-x 2 root root    0 Aug 16 01:22 power
-rw-rw-r-- 1 root root 4096 Aug 16 01:22 rate
```

```
lrwxrwxrwx 1 root root    0 Aug 16 01:22 subsystem -> ../../../../../bus/i2c
-rw-r--r-- 1 root root 4096 Aug 16 01:22 uevent
pi@raspberrypi /sys/bus/i2c/devices/1-0053 $
```

More Information

- Linux-Input mailing list: linux [dash] input [at] vger [dot] kernel [dot] org [mailto:linux%20%5Bdash%5D%20input%20%5Bat%5D%20vger%20%5Bdot%5D%20kernel%20%5Bdot%5D%20org]
- Linux-Input Patchwork Server [http://patchwork.kernel.org/project/linux-input/list]
- Linux-Input Git Repository [http://git.kernel.org/?p=linux/kernel/git/dtor/input.git;a=summary]

Need Help?

- Analog Devices Linux Device Drivers Help Forum [http://ez.analog.com/community/linux-device-drivers]
- Ask a Question [http://ez.analog.com/post!input.jspa?containerType=14&container=2061]

19 Nov 2012 14:04 · Lars-Peter Clausen

ADXL345/6 Android Acceleration Sensor

Using this driver under Android as Acceleration Sensor Follow the link here ADXL345 Android Sensor