AN2855
Application note

Configuration for single-click and double-click detection using the FC30

Introduction

This document is intended to provide application information for the click and double-click detection functions of the FC30.

When a single or double mechanical tap is detected, the FC30 provides an interrupt signal, enabling a “mouse button-like” function for intuitive man-machine interface solutions.

A power-down mode selectable through a dedicated command ensures very low current consumption in battery-operated devices.

Contents

1 Theory of operation

The click recognition function featured in the FC30 helps to create a man-machine interface with little software loading. The device can be configured to output an interrupt signal on a dedicated pin when tapped in any direction.

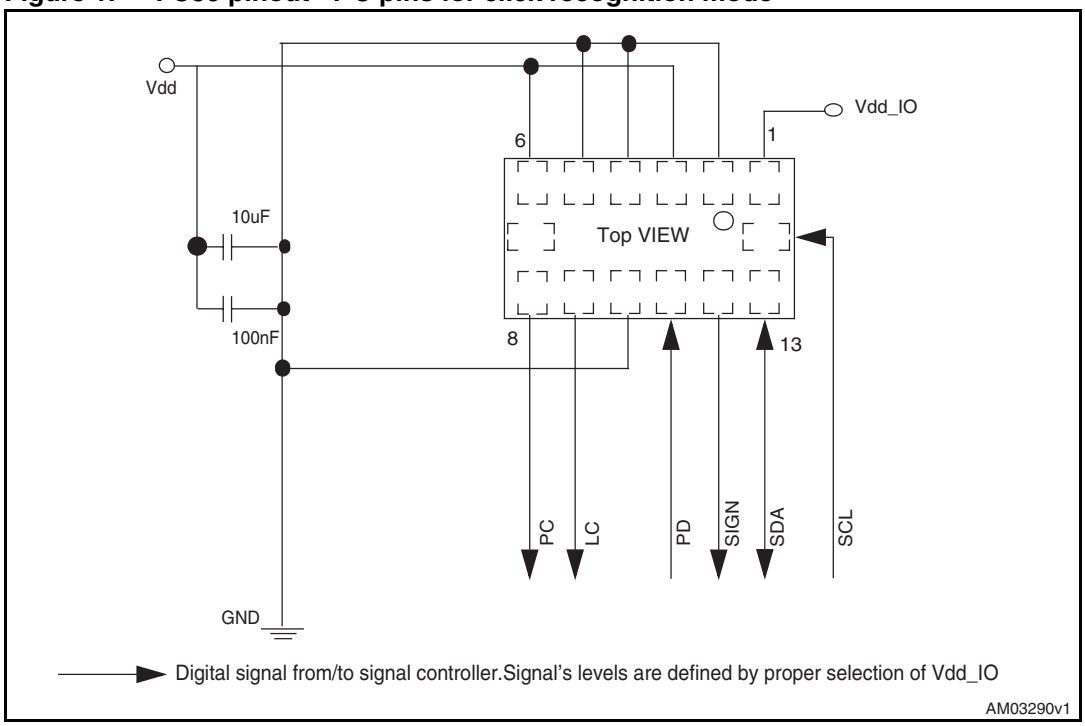
If the sensor is exposed to a single input stimulus, it generates an interrupt request on inertial interrupt pin PC. A more advanced feature allows the generation of an interrupt request when a double input stimulus with fixed time between the two events is recognized, enabling a mouse button-like functionality.

Note: While the device is operating in click/double-click recognition mode, the orientation detection function is not available.

1.1 Device pinout for click recognition mode

Click recognition mode is enabled through specific commands sent to the device over the I^2C bus that is available through dedicated pins (*Figure 1*).

Figure 1. FC30 pinout - I^2C pins for click recognition mode



1.2 Entering single click recognition mode

To enable the single-click recognition function, the device must first be configured for power-down mode driving PD pin to GND. Then the following sequence of commands must be sent to the device through I^2C bus:

```
I2C_Read(0x5D, 0x16, Value_1);
I2C_Write(0x5D, 0x16, Value_1 & 0x1F);
I2C_Write(0x1D, 0x3Bh, 0x77h);
I2C_Write(0x1D, 0x3Ch, 0x07h);
I2C_Write(0x1D, 0x3Dh, 0xFEh);
I2C_Write(0x1D, 0x3Eh, 0x10h);
I2C_Write(0x1D, 0x3Fh, 0xFFh);
I2C_Write(0x1D, 0x38h, 0x15h);
I2C_Write(0x1D, 0x20h, 0x47h);
I2C_Write(0x1D, 0x22h, 0x07h);
```

where `I2C_Read` and `I2C_Write` have the following syntax:

```
I2C_Read(SlaveAddress, SubAddress, DestinationValue);
I2C_Write(SlaveAddress, SubAddress, SourceValue);
```

At the end of the sequence the device will be in a power on state, ready to operate in single-click recognition mode and orientation detection is no longer active.

1.3 Entering double-click recognition mode

As with single-click recognition, to enable the double-click recognition function the device must be first configured for power-down mode driving PD pin to GND. Then the following sequence of commands must be sent to the device through I^2C bus:

```
I2C_Read(0x5D, 0x16, Value_1);
I2C_Write(0x5D, 0x16, Value_1 & 0x1F);
I2C_Write(0x1D, 0x3Bh, 0x77h);
I2C_Write(0x1D, 0x3Ch, 0x07h);
I2C_Write(0x1D, 0x3Dh, 0xFEh);
I2C_Write(0x1D, 0x3Eh, 0x10h);
I2C_Write(0x1D, 0x3Fh, 0xFFh);
I2C_Write(0x1D, 0x38h, 0x2Ah);
I2C_Write(0x1D, 0x20h, 0x47h);
I2C_Write(0x1D, 0x22h, 0x07h);
```

At the end of the sequence, the device will be in a power on state, ready to operate in double-click recognition mode and orientation detection is no longer active.

1.4 Exiting click recognition mode

To exit from the click recognition function and restore the orientation detection, the device must be first be turned off by switching off the power supply, then turned on.

2 Power-down mode

When the FC30 is operating in click or double-click recognition mode, the PD pin must be tied to GND and no longer enabling the power-down mode. Power-down mode is still available through dedicated I^2C commands.

2.1 Entering power-down mode

To enter the power-down mode, send the following I^2C command to the device:

```
I2C_Write(0x1D, 0x20h, 0x00h);
```

2.2 Exiting power-down mode

To exit the power-down mode, send the following I^2C command to the device:

```
I2C_Write(0x1D, 0x20h, 0x47h);
```

3 Revision history

Table 1. Document revision history

Date	Revision	Changes
17-Feb-2009	1	Initial release.