

Table of contents

| | |
|--|----|
| Table of contents..... | 1 |
| Revision history..... | 2 |
| 1.0 Introduction | 3 |
| 2.0 Specifications | 4 |
| 3.0 Mechanical Drawing | 5 |
| 3.1 Mechanical size..... | 5 |
| 3.2 Touch line pin definition | 6 |
| 3.3 Interface pin definition | 7 |
| 3.4 Connector specifications | 11 |
| 4.0 Drivers and utilities..... | 12 |
| 4.1 Drivers..... | 12 |
| 4.2 Utilities..... | 12 |
| 5.0 Others | 13 |
| 5.1 ROHS compliance..... | 13 |
| 5.2 EMC protection recommendations | 13 |
| 5.3 Noise protection | 13 |

Revision history

| Rev. | Date | By | Summary | Remark |
|------|------------|---------|---|--------|
| 1.0 | 2015/03/05 | Ken Hsu | 1. New release | |
| 1.1 | 2015/12/22 | Ken Hsu | 1. Operation temperature modified | |
| 1.2 | 2016/03/11 | Ken Hsu | 1. Correct item 3.3 Interface pin definition | |
| 1.3 | 2016/05/11 | Ken Hsu | 1. Correct item 2.10 Operating temperature 2. Add item 2.12 Operating or Storage Humidity Range 3. Add item 2.5 Firmware Resolution | |
| 1.4 | 2016/11/18 | Ken Hsu | 1. Correct item 3.3 Interface pin definition 2. Delete item 2.15 MTBF 3. Add item 2.15 Watchdog Timer | |
| 1.5 | 2017/03/03 | Ken Hsu | 1. Correct item 2.0 Sampling rate ,change the unit from sps to Hz 2. Add item 2.0 Response time 3. Correct item 3.3 Interface pin definition ,I2C SCL / SDA description | |

1.0 Introduction

The PenMount PM1410 control board is a high specification (Projected Capacitive Input, PCI) touch panel controller product introduced by PenMount. The PenMount PM1410 can be applied in the consumer, commercial and industrial fields.

The PenMount PM1410 provides four types of interfaces, USB、I²C、UART and RS232 and supports PCI touch panels sized from 12.1" to 15.6". The PenMount PM1410 also supports a wide range of operating systems such as Windows and Linux.

The PenMount PM1410 was developed based on Microchip microprocessors and is paired with PenMount's in-house hardware design and firmware algorithmic mechanism. It provides high performance computing and possesses excellent anti-noise capabilities.

There are five connectors on this board: 60Pin & 40 Pins ZIF connectors for PCI touch screen FPC cables, one USB connector for 4-pin USB cable (optional), and one I²C/UART connector for 7-pin I²C cable (optional), and one RS232 connector for 5-pin RS232 cable (optional)

2.0 Specifications

| Parameter | | feature |
|-------------------------|------------------|---|
| Controller part number | | PenMount P2-08 x 2pcs |
| Number of sensing line | | 38 |
| Number of driving line | | 57 |
| Supporting touch panel | | Projected capacitive type, from 12.1" to 15.6" |
| Interface | USB | Full-speed, 12Mbps |
| | UART/RS232 | 38400 baud rate / 8bit data / non parity / one stop bit / non-PnP |
| | I ² C | Slave, 400 kHz |
| ADC resolution | | 10bits (Typical) |
| Firmware resolution | | 2048 x 2048 (Typical) |
| Response time | | Average < 30ms |
| Sampling rate | 1 finger touch | 160 Hz(Typical) |
| | 5 fingers touch | 100 Hz(Typical) |
| Operating voltage | | +5Vdc, ±5 % |
| Power consumption | Working mode | 60.3mA @ 5Vdc |
| | Idle mode | 46.5mA @ 5Vdc |
| | Sleep mode | 3.0mA @ 5Vdc |
| Operating temperature | | -40°C ~ +85°C |
| Storage temperature | | -40°C ~ +85°C |
| Relative humidity range | | 95% RH at 60°C. RH Non-condensing |
| EMS specification | RS | IEC61000-4-3 Level 3 , Criteria A, dual touch points |
| | CS | IEC61000-4-6 Level 3 , Criteria A, dual touch points |
| Watchdog Timer | | Support WDT function through firmware programming |

Note :

CS and RS performance, Power consumption and sample rate will vary according to different firmware versions.

3.2 Touch line pin definition

| JL4 40Pin ZIF , PH 0.5mm ; HRS FH52-40S-05SH | | | | | | | |
|--|---------------|-----|---------------|-----|---------------|-----|--------------|
| PIN | Description | PIN | Description | PIN | Description | PIN | Description |
| 1 | GND | 11 | Cap Sense Y28 | 21 | Cap Sense Y18 | 31 | Cap Sense Y8 |
| 2 | Cap Sense Y37 | 12 | Cap Sense Y27 | 22 | Cap Sense Y17 | 32 | Cap Sense Y7 |
| 3 | Cap Sense Y36 | 13 | Cap Sense Y26 | 23 | Cap Sense Y16 | 33 | Cap Sense Y6 |
| 4 | Cap Sense Y35 | 14 | Cap Sense Y25 | 24 | Cap Sense Y15 | 34 | Cap Sense Y5 |
| 5 | Cap Sense Y34 | 15 | Cap Sense Y24 | 25 | Cap Sense Y14 | 35 | Cap Sense Y4 |
| 6 | Cap Sense Y33 | 16 | Cap Sense Y23 | 26 | Cap Sense Y13 | 36 | Cap Sense Y3 |
| 7 | Cap Sense Y32 | 17 | Cap Sense Y22 | 27 | Cap Sense Y12 | 37 | Cap Sense Y2 |
| 8 | Cap Sense Y31 | 18 | Cap Sense Y21 | 28 | Cap Sense Y11 | 38 | Cap Sense Y1 |
| 9 | Cap Sense Y30 | 19 | Cap Sense Y20 | 29 | Cap Sense Y10 | 39 | Cap Sense Y0 |
| 10 | Cap Sense Y29 | 20 | Cap Sense Y19 | 30 | Cap Sense Y9 | 40 | GND |

| JL5 60Pin ZIF , PH 0.5mm ; HRS FH52-60S-05SH | | | | | | | |
|--|---------------|-----|---------------|-----|---------------|-----|---------------|
| PIN | Description | PIN | Description | PIN | Description | PIN | Description |
| 1 | GND | 16 | Cap Drive X14 | 31 | Cap Drive X29 | 46 | Cap Drive X44 |
| 2 | Cap Drive X0 | 17 | Cap Drive X15 | 32 | Cap Drive X30 | 47 | Cap Drive X45 |
| 3 | Cap Drive X1 | 18 | Cap Drive X16 | 33 | Cap Drive X31 | 48 | Cap Drive X46 |
| 4 | Cap Drive X2 | 19 | Cap Drive X17 | 34 | Cap Drive X32 | 49 | Cap Drive X47 |
| 5 | Cap Drive X3 | 20 | Cap Drive X18 | 35 | Cap Drive X33 | 50 | Cap Drive X48 |
| 6 | Cap Drive X4 | 21 | Cap Drive X19 | 36 | Cap Drive X34 | 51 | Cap Drive X49 |
| 7 | Cap Drive X5 | 22 | Cap Drive X20 | 37 | Cap Drive X35 | 52 | Cap Drive X50 |
| 8 | Cap Drive X6 | 23 | Cap Drive X21 | 38 | Cap Drive X36 | 53 | Cap Drive X51 |
| 9 | Cap Drive X7 | 24 | Cap Drive X22 | 39 | Cap Drive X37 | 54 | Cap Drive X52 |
| 10 | Cap Drive X8 | 25 | Cap Drive X23 | 40 | Cap Drive X38 | 55 | Cap Drive X53 |
| 11 | Cap Drive X9 | 26 | Cap Drive X24 | 41 | Cap Drive X39 | 56 | Cap Drive X54 |
| 12 | Cap Drive X10 | 27 | Cap Drive X25 | 42 | Cap Drive X40 | 57 | Cap Drive X55 |
| 13 | Cap Drive X11 | 28 | Cap Drive X26 | 43 | Cap Drive X41 | 58 | Cap Drive X56 |
| 14 | Cap Drive X12 | 29 | Cap Drive X27 | 44 | Cap Drive X42 | 59 | GND |
| 15 | Cap Drive X13 | 30 | Cap Drive X28 | 45 | Cap Drive X43 | 60 | GND |

3.3 Interface pin definition

PM1410 includes USB/I2C/UART/RS232 communication interfaces, intends to maximize application flexibility and reliability, and minimizes cost through elimination of external components.

| JL1 / 4PIN / ACES 50224-00401-001 | | | | | | |
|-----------------------------------|-----|------------------------------------|-----|-----|-----|------|
| PIN NO. | USB | Description | Min | Typ | Max | Unit |
| 1 | VCC | Positive power supply | | 5 | | V |
| 2 | D- | D- pin of internal USB transceiver | | 3.3 | | V |
| 3 | D+ | D+ pin of internal USB transceiver | | 3.3 | | V |
| 4 | GND | Ground | | 0 | | V |

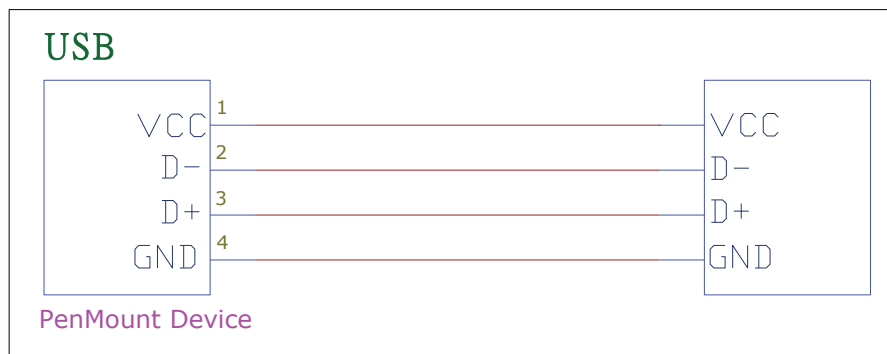


Figure1 USB interface

| JL2 / 5PIN / ACES 50224-00501-001 | | | | | | |
|-----------------------------------|-------|-----------------------|-------|-----|-------|------|
| PIN NO. | RS232 | Description | Min | Typ | Max | Unit |
| 1 | VCC | Positive power supply | | 5 | | V |
| 2 | RXD | RS232 receive | -25 | | +25 | V |
| | | input threshold low | 0.8 | 1.5 | | |
| | | input threshold high | | 1.8 | 2.4 | |
| 3 | TXD | RS232 transmit | -13.2 | | +13.2 | V |
| | | output threshold low | | | 0.4 | |
| | | output threshold high | 4.4 | 4.9 | | |
| 4 | GND | Ground | | 0 | | V |
| 5 | GND | Ground | | 0 | | V |

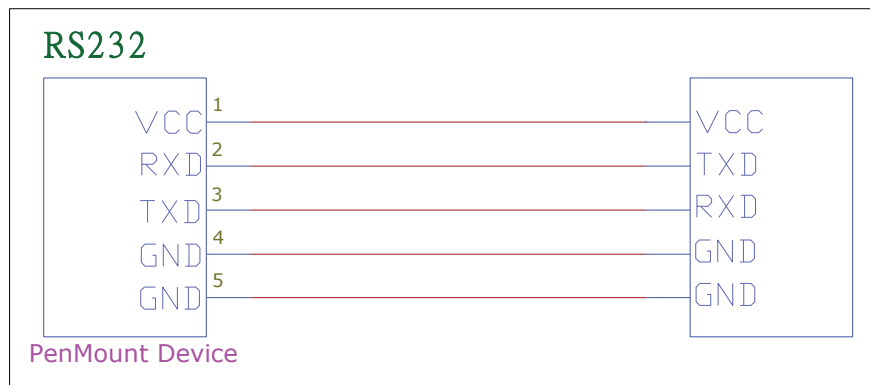


Figure2 RS232 interface

| JL3 / 7PIN ; ACES 50224-00701-001 | | | |
|-----------------------------------|-----------|------------------|--------|
| PIN NO. | SYMBOL | PIN ASSIGNMENT | |
| | | I ² C | UART |
| 1 | VCC | VCC | VCC |
| 2 | GND | Ground | Ground |
| 3 | SCL / RXD | SCL | RXD |
| 4 | SDA / TXD | SDA | TXD |
| 5 | nRESET | N.C. | N.C. |
| 6 | nDETECT | Low | Low |
| 7 | nINT | nINT | Low |

| PIN NO. | Type | Description | Min | Typ | Max | Unit |
|---------|------|--|-----|-----|-----|------|
| VCC | P | Positive power supply | | 5 | | V |
| GND | P | Ground | | 0 | | V |
| SCL | I/O | Serial clock line for I2C. Open drain requires external pull-up to 3.3V. | | 3.3 | | V |
| SDA | I/O | Serial data line for I2C. Open drain requires external pull-up to 3.3V | | 3.3 | | V |
| RXD | I | UART receive | | 3.3 | | V |
| TXD | O | UART transmit | | 3.3 | | V |
| nRESET | I | Open-drain and active low to reset PM1410 and must be driven low for 5 μ s (typical) to be valid. Leave the pin unconnected if not used. | | | | V |
| nDETECT | I | Pull low when selecting I2C or UART interface | | 0 | | V |
| nINT | O | Processor Interrupt. This pin is active low, open drain requires external pull-up to 3.3V. | | 3.3 | | V |

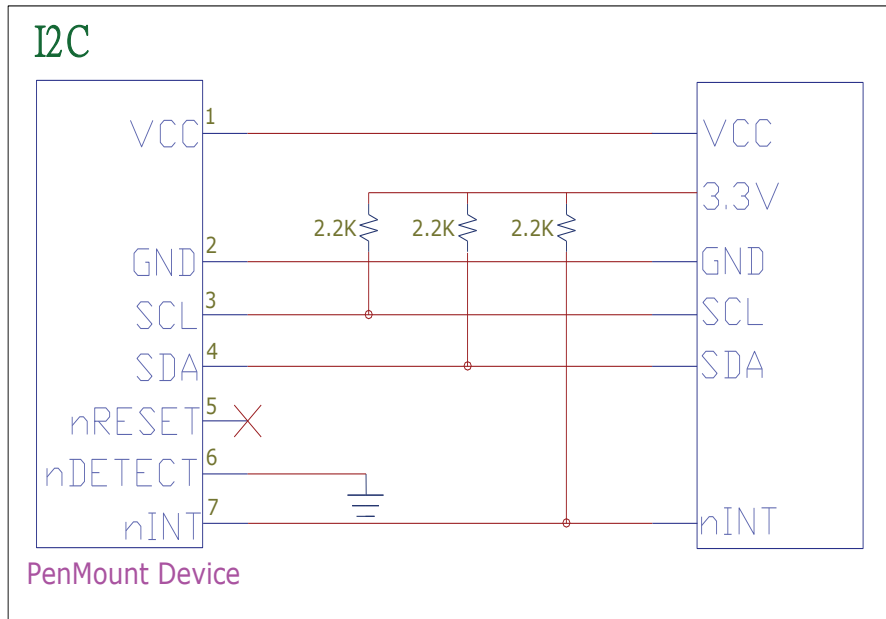


Figure3 I2C interface

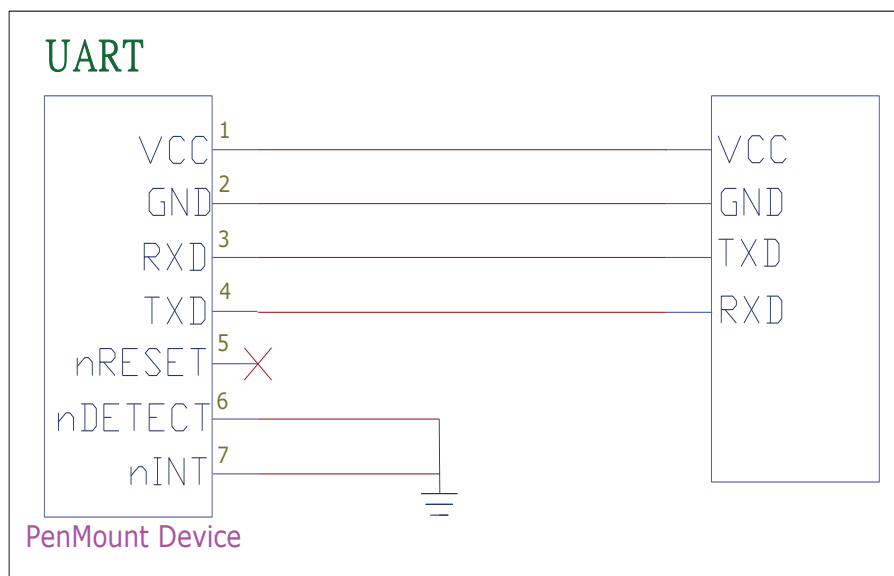
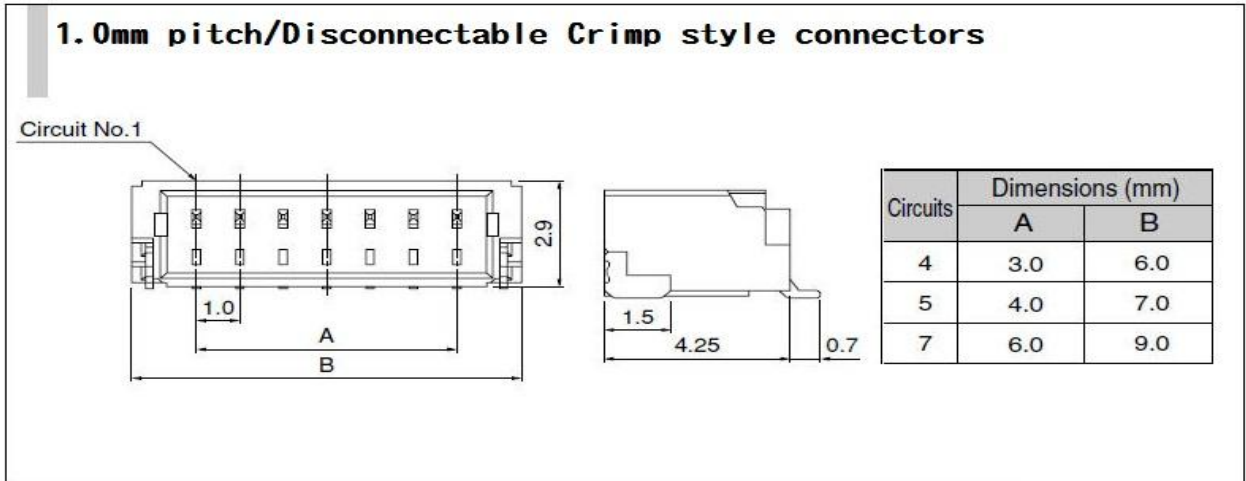


Figure4 UART interface

3.4 Connector specifications



4.0 Drivers and utilities

4.1 Drivers

For I²C:

- Windows CE : Binary driver for freescale iMX platform. Other platform by request.
- Linux / Android : Source code for integration.

For USB

- Windows 2000, XP, 2003: single touch, mouse driver.
- Windows Vista: single touch, inbox driver.
- Windows 7,8,10: five touch, Inbox driver.
- Linux: Ubuntu, Android, other versions of Linux support, please refer PenMount website

For UART / RS-232

- Windows 2000, XP, 2003: single touch, mouse driver.
- Windows Vista: single touch, digitizer driver.
- Windows 7,8,10: 5 touches support, digitizer driver.
- Linux: inbox driver after kernel 3.2, provide source code for kernel 2.6

(Provide source code for integration if any)

4.2 Utilities

Firmware adjustment utility allows user to fine tune the touch panel sensitivity.

Note:

All drivers and utilities are available on PenMount websites. Please contact us for further information.

5.0 Others

5.1 ROHS compliance

This control board is ROHS compliant

5.2 EMC protection recommendations

Please refer to PCI touch screen integration guides.

5.3 Noise protection

To achieve good noise interference protection capabilities, PenMount requires paired interface cables possess comprehensive EMI shielding.

The cable should have a woven or spirally copper shield with 360 ° shield coverage

The shield must be terminated to the receptacle and be connected to ground plane carefully.

Below is an example for 4-pin USB cable diagram. For other implementation, please follow the same design rules.

