

## 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	New release	
1.1	2015/12/22	Ken Hsu	Operation temperature modified	
1.2	2016/03/11	Ken Hsu	Correct item 3.3 Interface pin definition	
1.3	2016/05/11	Ken Hsu	Correct item 2.10 Operating temperature Add item 2.12 Operating or Storage Humidity Range Add item 2.5 Firmware Resolution	
1.4	2016/11/18	Ken Hsu	Correct item 3.3 Interface pin definition Delete item 2.15 MTBF Add item 2.15 Watchdog Timer	
1.5	2017/03/03	Ken Hsu	Correct item 2.0 Sampling rate ,change the unit from sps to Hz Add item 2.0 Response time Correct item 3.3 Interface pin definition ,I2C SCL / SDA description	
1.6	2017/4/20	Ken Hsu	Correct item 3.3 Interface pin definition The i2c interface detect pin amended to float	

## 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、I<sup>2</sup>C、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 I<sup>2</sup>C/UART connector for 7-pin I<sup>2</sup>C cable (optional), and one RS232 connector for 5-pin RS232 cable (optional)

## 2.0 Specifications

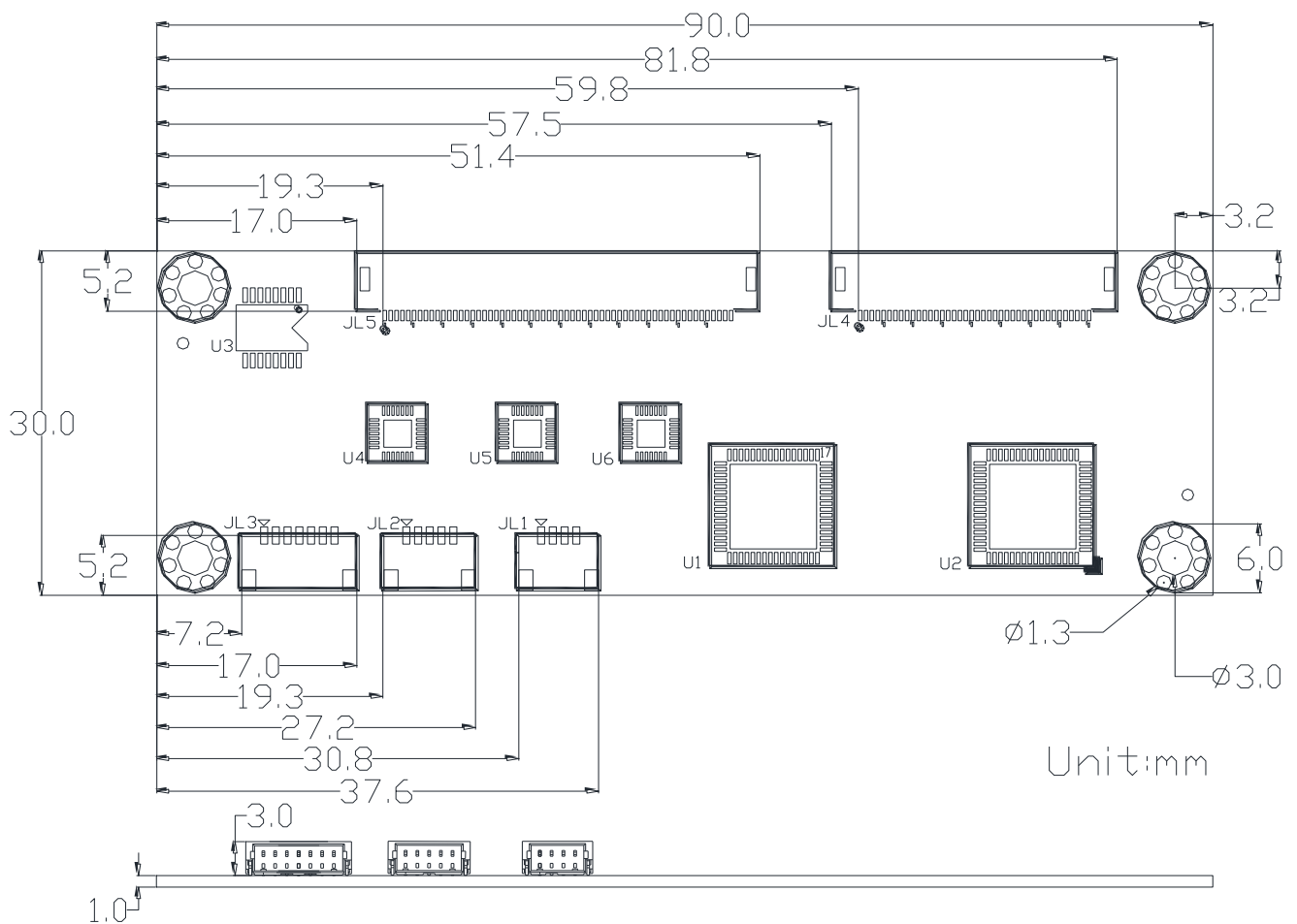
Parameter		feature
Controller part number		PenMount P2-08 x 2pcs
Number of sensing line		38
Number of driving line		57
Supporting projected capacitive touch panel size		Projected capacitive type, from 12.1" to 15.6"
Interface	USB	Full-speed, 12Mbps
	UART/RS232	38400 baud rate / 8bit data / non parity / one stop bit / non-PnP
	I <sup>2</sup> C	Slave, 400 kHz
ADC resolution		10bits (Typical)
Firmware resolution		2048 x 2048 (Typical)
Response time		Average < 30ms
Sampling rate	One finger touch	160 Hz(Typical)
	Five 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.

### 3.0 Mechanical Drawing

#### 3.1 Mechanical size



### 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

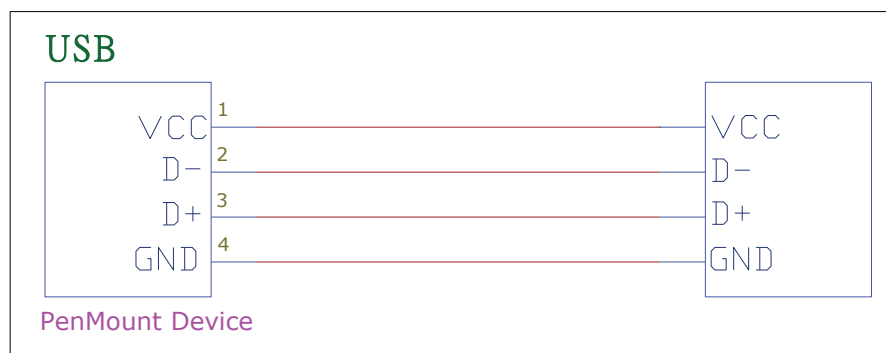


Figure1 USB interface

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

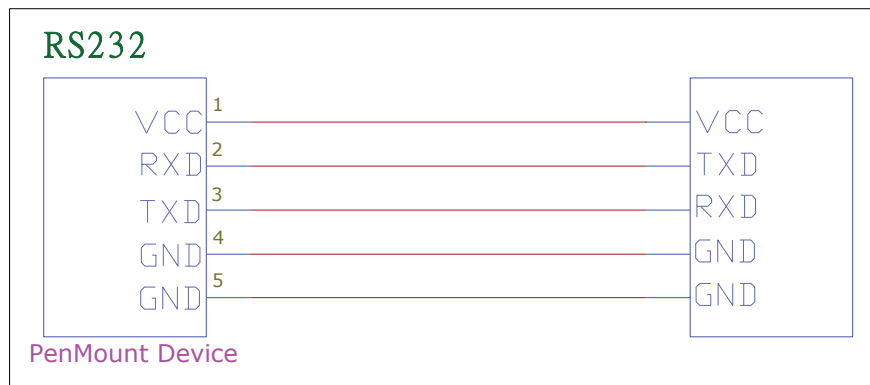


Figure2 RS232 interface



JL3 / 7PIN ; ACES 50224-00701-001			
PIN NO.	SYMBOL	PIN ASSIGNMENT	
		I <sup>2</sup> 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	N.C.	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 $\mu$ s (typical) to be valid. Leave the pin unconnected if not used.				V
nDETECT	I	Pull low when selecting UART interface float when selecting I2C interface		0		V
nINT	O	Processor Interrupt. This pin is active low, open drain requires external pull-up to 3.3V.		3.3		V

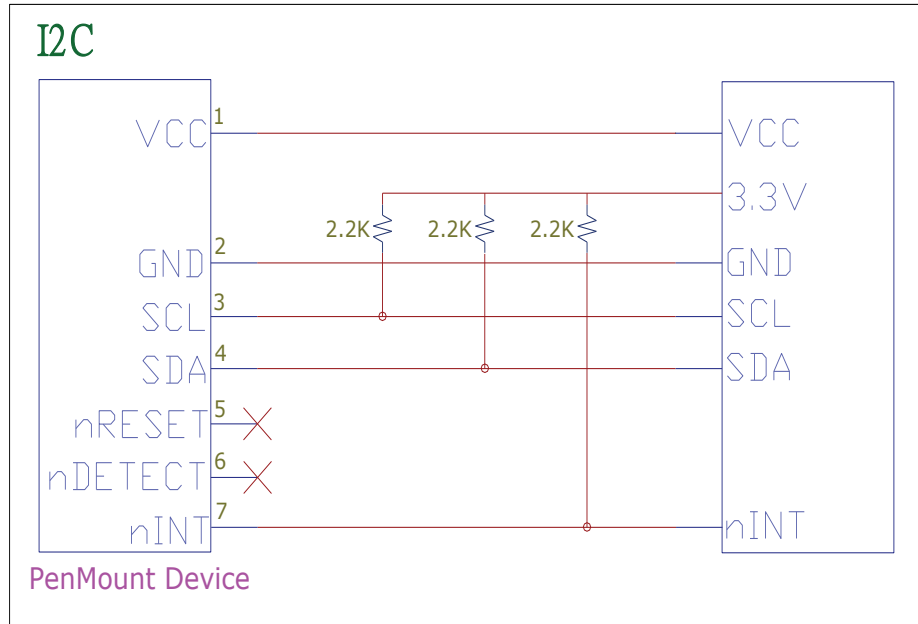


Figure3 I2C interface

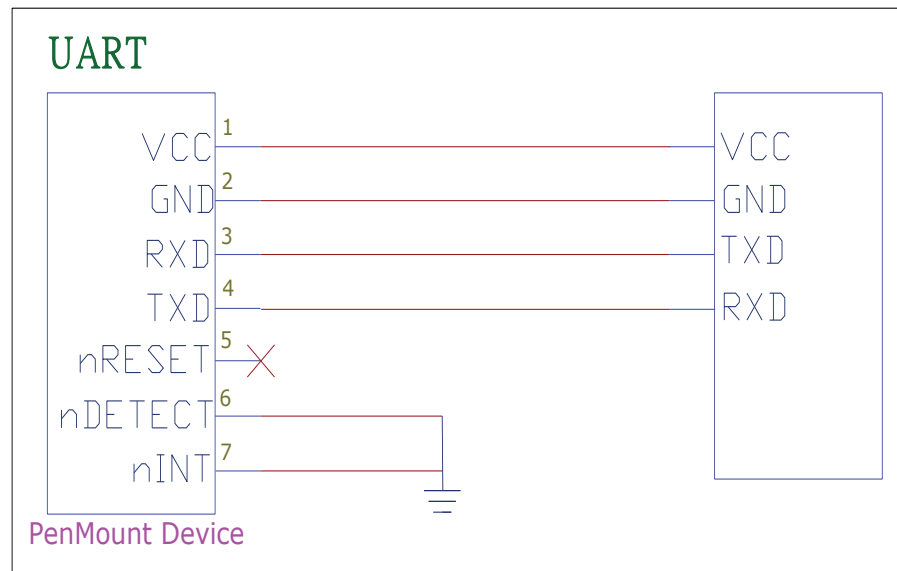
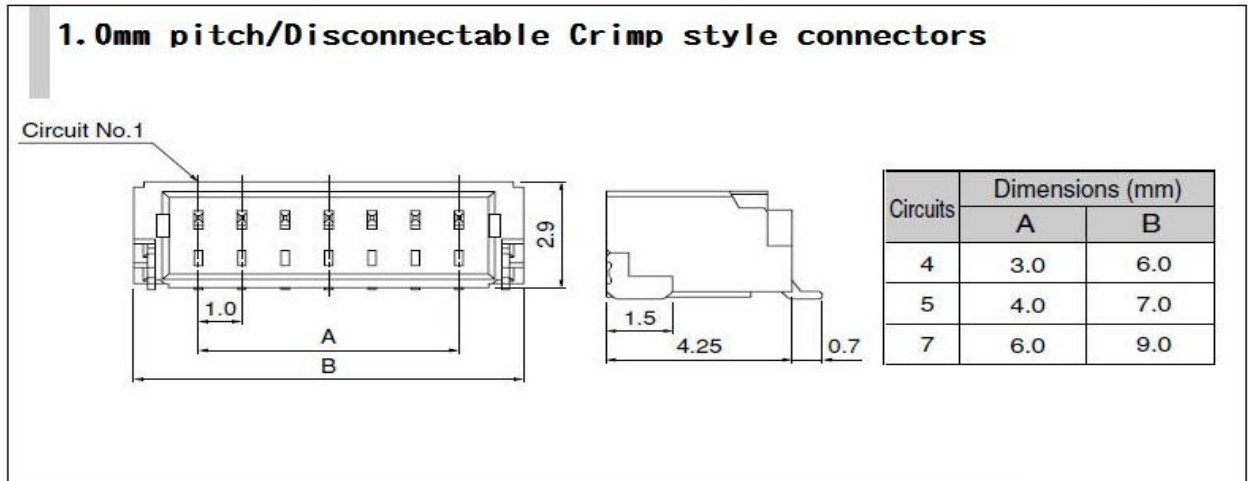


Figure4 UART interface

### 3.4 Connector specifications



## 4.0 Drivers and utilities

### 4.1 Drivers

For I<sup>2</sup>C:

- 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.

