



# PenMount PM1310 PCI Controller Board Data Sheet

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## Revision history

Rev.	Date	By	Summary	Remark
1.0	2015/01/19	Ken Hsu	New release	
1.1	2015/12/16	Ken Hsu	Operation temperature modified	
1.2	2016/03/11	Ken Hsu	Correct item 3.3 Interface pin definition	
1.3	2.016/05/11	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 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 PM1310 control board is a high specification (Projected Capacitive Input, PCI) touch panel controller product introduced by PenMount. The PenMount PM1310 can be applied in the consumer, commercial and industrial fields.

The PenMount PM1310 provides three types of interfaces, USB、I<sup>2</sup>C、UART and supports PCI touch panels sized from 8.4" to 10.4". The PenMount PM1310 also supports a wide range of operating systems such as Windows and Linux.

The PenMount PM1310 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 four connectors on this board: two 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)

## 2.0 Specifications

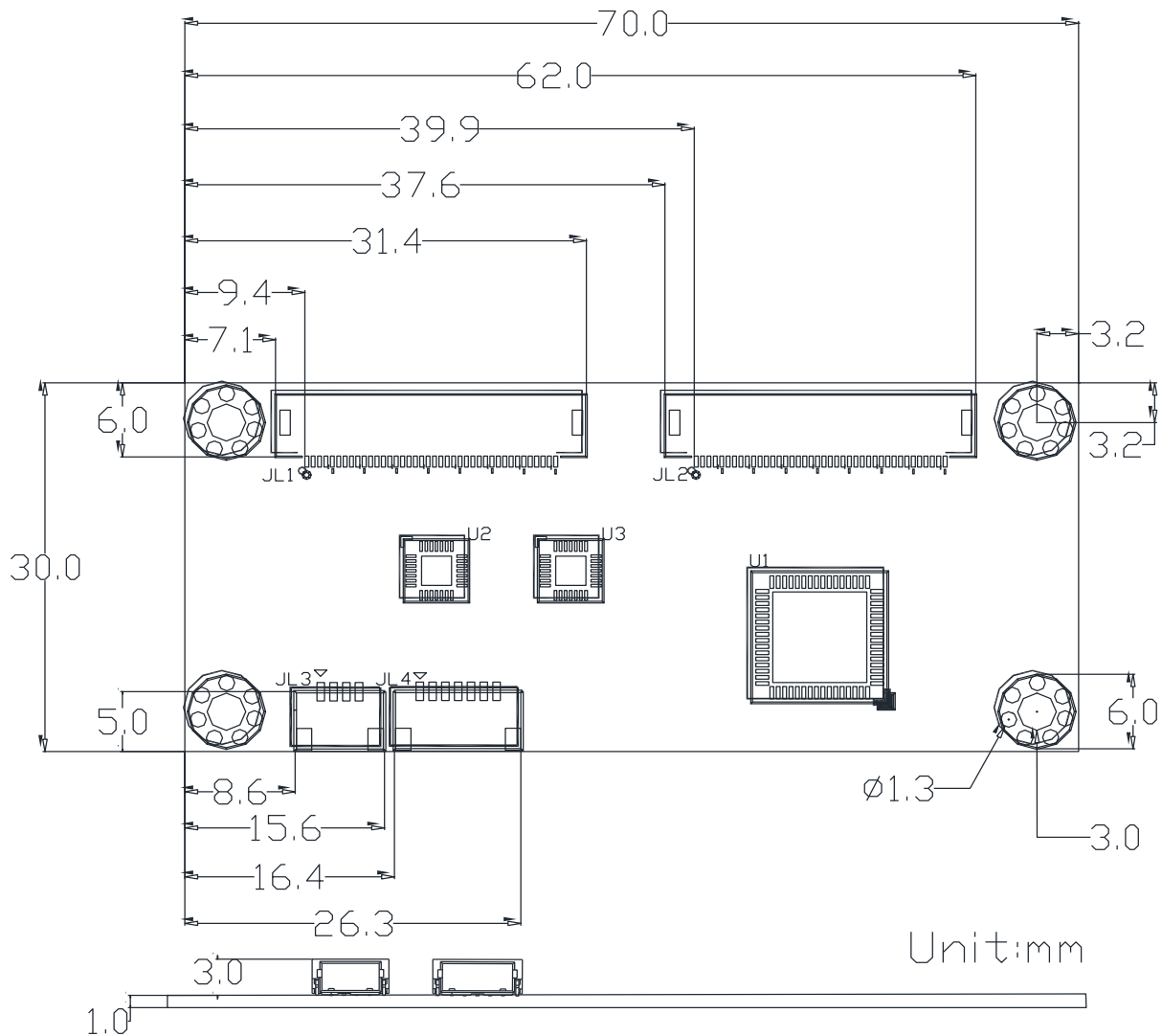
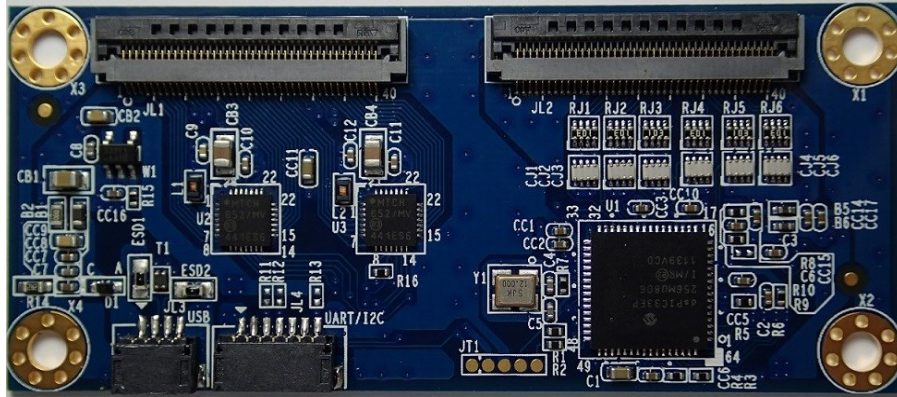
Parameter		feature
Controller part number		PenMount P2-08 x 1pcs
Number of sensing line		23
Number of driving line		35
Supporting projected capacitive touch panel size		Projected capacitive type, from 8.4" to 10.4"
Interface	USB	Full-speed, 12Mbps
	UART	38400 baud rate / 8bit data / non parity / one 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 < 25ms
Sampling rate	One finger touch	160 Hz(Typical)
	Five fingers touch	100 Hz(Typical)
Operating voltage		+5Vdc, ±5 %
Power consumption	Working mode	33.2mA @ 5Vdc
	Idle mode	23.2mA @ 5Vdc
	Sleep mode	1.0mA @ 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

JL1 40Pin ZIF , PH 0.5mm ; HRS FH52-40S-05SH							
PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	Ground	11	Cap Drive X6	21	Cap Drive X16	31	Cap Drive X26
2	Ground	12	Cap Drive X7	22	Cap Drive X17	32	Cap Drive X27
3	NC	13	Cap Drive X8	23	Cap Drive X18	33	Cap Drive X28
4	Ground	14	Cap Drive X9	24	Cap Drive X19	34	Cap Drive X29
5	Cap Drive X0	15	Cap Drive X10	25	Cap Drive X20	35	Cap Drive X30
6	Cap Drive X1	16	Cap Drive X11	26	Cap Drive X21	36	Cap Drive X31
7	Cap Drive X2	17	Cap Drive X12	27	Cap Drive X22	37	Cap Drive X32
8	Cap Drive X3	18	Cap Drive X13	28	Cap Drive X23	38	Cap Drive X33
9	Cap Drive X4	19	Cap Drive X14	29	Cap Drive X24	39	Cap Drive X34
10	Cap Drive X5	20	Cap Drive X15	30	Cap Drive X25	40	Ground

JL2 40Pin ZIF , PH 0.5mm ; HRS FH52-40S-05SH							
PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	NC	11	NC	21	Cap Sense Y15	31	Cap Sense Y5
2	NC	12	Ground	22	Cap Sense Y14	32	Cap Sense Y4
3	NC	13	NC	23	Cap Sense Y13	33	Cap Sense Y3
4	NC	14	Cap Sense Y22	24	Cap Sense Y12	34	Cap Sense Y2
5	NC	15	Cap Sense Y21	25	Cap Sense Y11	35	Cap Sense Y1
6	NC	16	Cap Sense Y20	26	Cap Sense Y10	36	Cap Sense Y0
7	NC	17	Cap Sense Y19	27	Cap Sense Y9	37	NC
8	NC	18	Cap Sense Y18	28	Cap Sense Y8	38	Ground
9	NC	19	Cap Sense Y17	29	Cap Sense Y7	39	NC
10	NC	20	Cap Sense Y16	30	Cap Sense Y6	40	Ground

### 3.3 Interface pin definition

PM1310 includes USB/I2C/UART communication interfaces, intends to maximize application flexibility and reliability, and minimizes cost through elimination of external components.

JL3 / 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

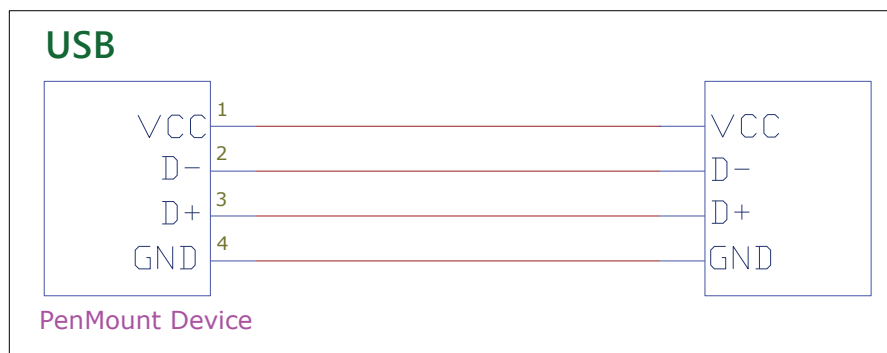


Figure1 USB interface

JL4 / 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 PM1310 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



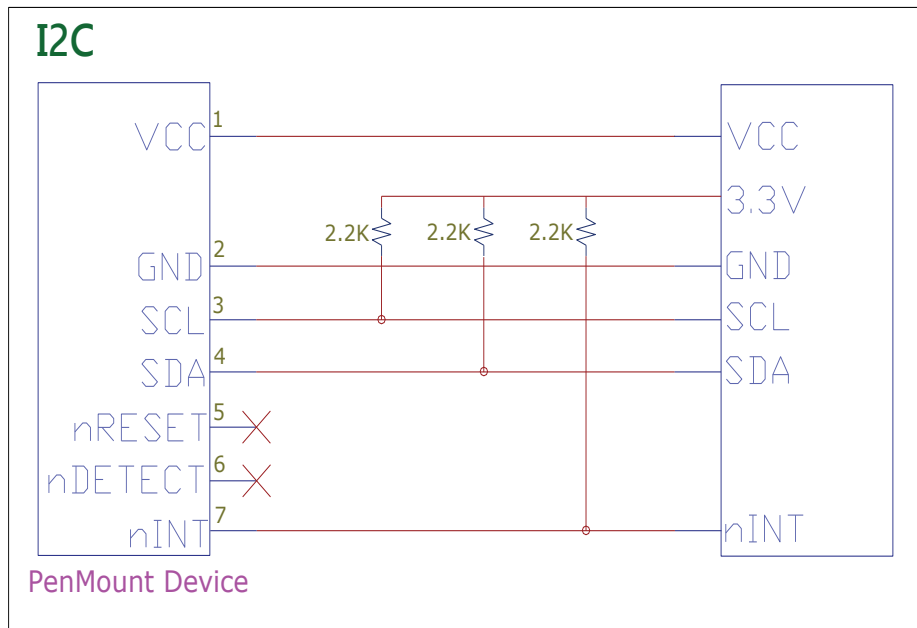


Figure2 I2C interface

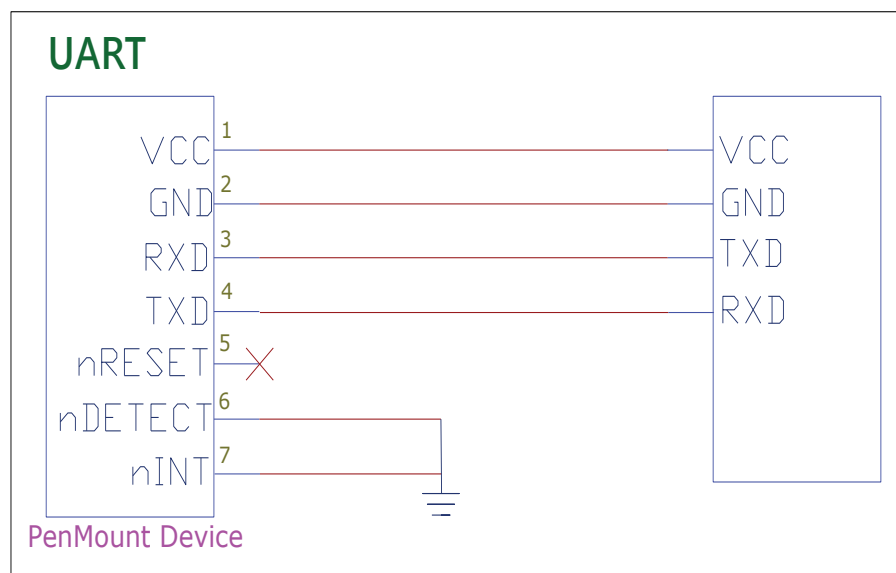
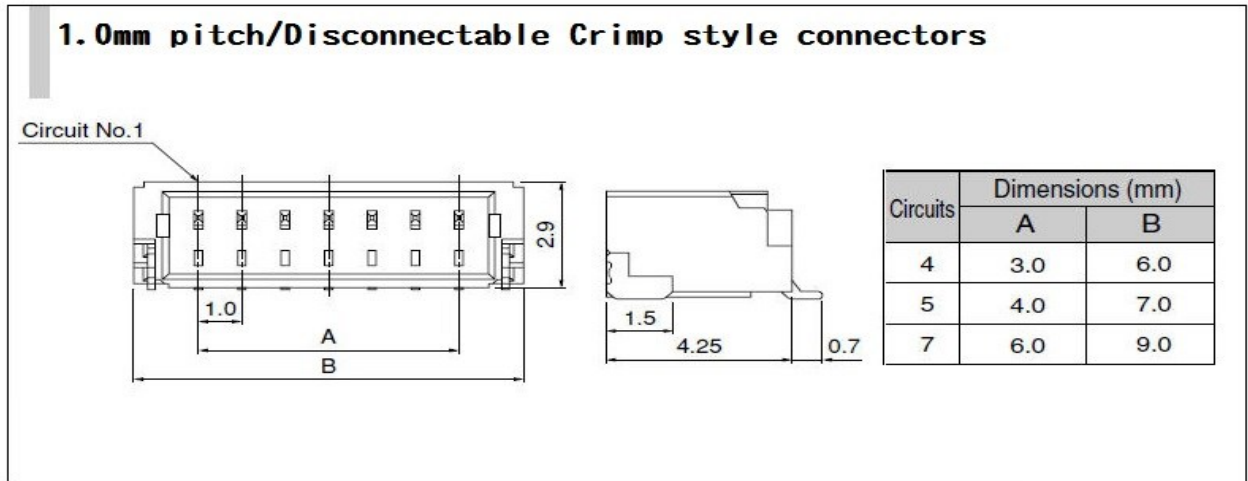


Figure3 UART interface

### 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

- 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.

