

PM1420 PCAP CONTROLLER

DATASHEET

Version:1.0
Issue date:2025/04/21

Revision Table

Date	Revision	Changes
2025/4/21	1.0	New Release

PenMount PM1420 Controller Board Data Sheet

1.0 Specifications

Parameter		feature
MCU		iBLab S1104
Number of sensing line		38 (Max)
Number of driving line		57 (Max)
Supporting touch panel		Projected capacitive type, from 12.1" to 15.6"
Interface	USB	Full-speed, 12Mbps
	UART	38400 baud rate / 8bit data / non parity / one stop bit / non-PnP
	I ² C	Slave, 400 kHz
Firmware resolution		4096 x 4096 (Note1)
Sampling Rate	1 finger touch	165 Hz(Typical)
	5 finger touch	150 Hz(Typical)
	10 finger touch	130 Hz(Typical)
Response time		Average < 30ms
Operating voltage		+5Vdc, ±5 %
Power consumption	Working mode	78mA @ 5Vdc
	Idle mode	70mA @ 5Vdc
	Sleep mode	2mA @ 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

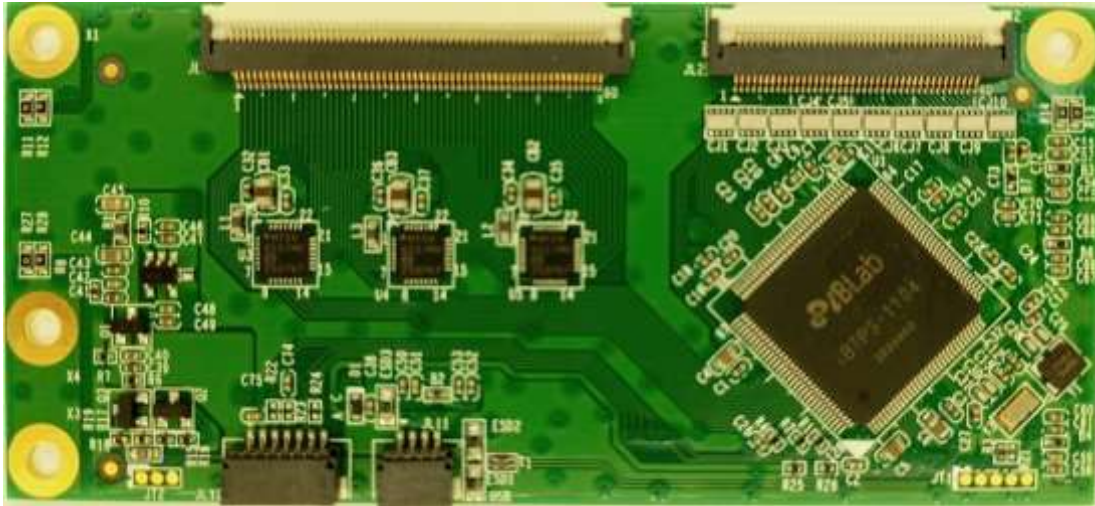
Note :

1. The firmware resolution depends on the firmware version and configuration. The maximum resolution can be set up to 16,384 x 16,384.
2. Check the release notes for details based on the hardware and software versions.

PenMount PM1420 Controller Board Data Sheet

2.0 Mechanical Drawing

2.1 Mechanical size.



*(The product pictures is subject to change without notice. Consult PenMount for the latest ones.)

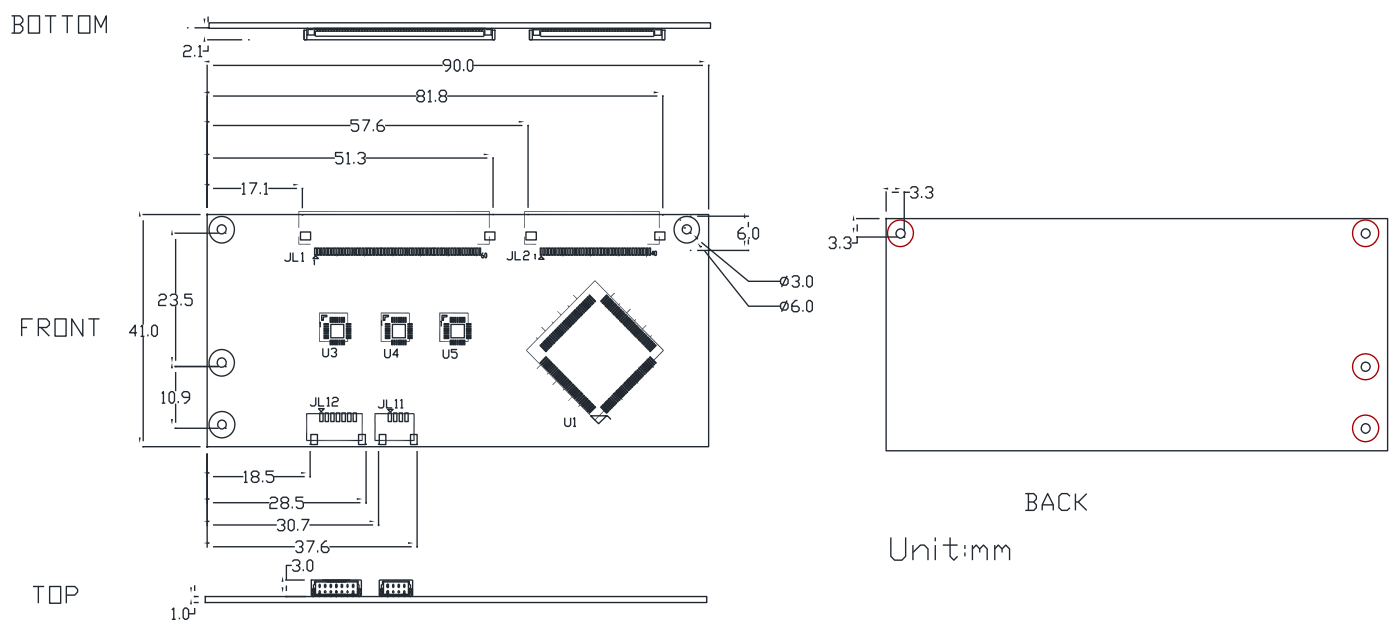


Figure 1 PM1420

PenMount PM1420 Controller Board Data Sheet

2.1 Touch line pin definition

JL1 60Pin ZIF , PH 0.5mm ; ACES : 52561-06001-001							
PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	GND	16	Cap Drive X15	31	Cap Drive X30	46	Cap Drive X45
2	Cap Drive X1	17	Cap Drive X16	32	Cap Drive X31	47	Cap Drive X46
3	Cap Drive X2	18	Cap Drive X17	33	Cap Drive X32	48	Cap Drive X47
4	Cap Drive X3	19	Cap Drive X18	34	Cap Drive X33	49	Cap Drive X48
5	Cap Drive X4	20	Cap Drive X19	35	Cap Drive X34	50	Cap Drive X49
6	Cap Drive X5	21	Cap Drive X20	36	Cap Drive X35	51	Cap Drive X50
7	Cap Drive X6	22	Cap Drive X21	37	Cap Drive X36	52	Cap Drive X51
8	Cap Drive X7	23	Cap Drive X22	38	Cap Drive X37	53	Cap Drive X52
9	Cap Drive X8	24	Cap Drive X23	39	Cap Drive X38	54	Cap Drive X53
10	Cap Drive X9	25	Cap Drive X24	40	Cap Drive X39	55	Cap Drive X54
11	Cap Drive X10	26	Cap Drive X25	41	Cap Drive X40	56	Cap Drive X55
12	Cap Drive X11	27	Cap Drive X26	42	Cap Drive X41	57	Cap Drive X56
13	Cap Drive X12	28	Cap Drive X27	43	Cap Drive X42	58	Cap Drive X57
14	Cap Drive X13	29	Cap Drive X28	44	Cap Drive X43	59	GND
15	Cap Drive X14	30	Cap Drive X29	45	Cap Drive X44	60	GND

JL2 40Pin ZIF , PH 0.5mm ; ACES : 52561-04001-001							
PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	GND	11	Cap Sense Y10	21	Cap Sense Y20	31	Cap Sense Y30
2	Cap Sense Y1	12	Cap Sense Y11	22	Cap Sense Y21	32	Cap Sense Y31
3	Cap Sense Y2	13	Cap Sense Y12	23	Cap Sense Y22	33	Cap Sense Y32
4	Cap Sense Y3	14	Cap Sense Y13	24	Cap Sense Y23	34	Cap Sense Y33
5	Cap Sense Y4	15	Cap Sense Y14	25	Cap Sense Y24	35	Cap Sense Y34
6	Cap Sense Y5	16	Cap Sense Y15	26	Cap Sense Y25	36	Cap Sense Y35
7	Cap Sense Y6	17	Cap Sense Y16	27	Cap Sense Y26	37	Cap Sense Y36
8	Cap Sense Y7	18	Cap Sense Y17	28	Cap Sense Y27	38	Cap Sense Y37
9	Cap Sense Y8	19	Cap Sense Y18	29	Cap Sense Y28	39	Cap Sense Y38
10	Cap Sense Y9	20	Cap Sense Y19	30	Cap Sense Y29	40	GND

PenMount PM1420 Controller Board Data Sheet

2.2 Interface pin definition

PM1420 includes USB/I2C/UART communication interfaces, intends to maximize application flexibility and reliability, and minimizes cost through elimination of external components.

JL11 / 4PIN / ACES 50224-00401-001						
PIN NO.	USB	Description	Min	Typ	Max	Unit
1	VCC	Positive power supply	4.75	5	5.25	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

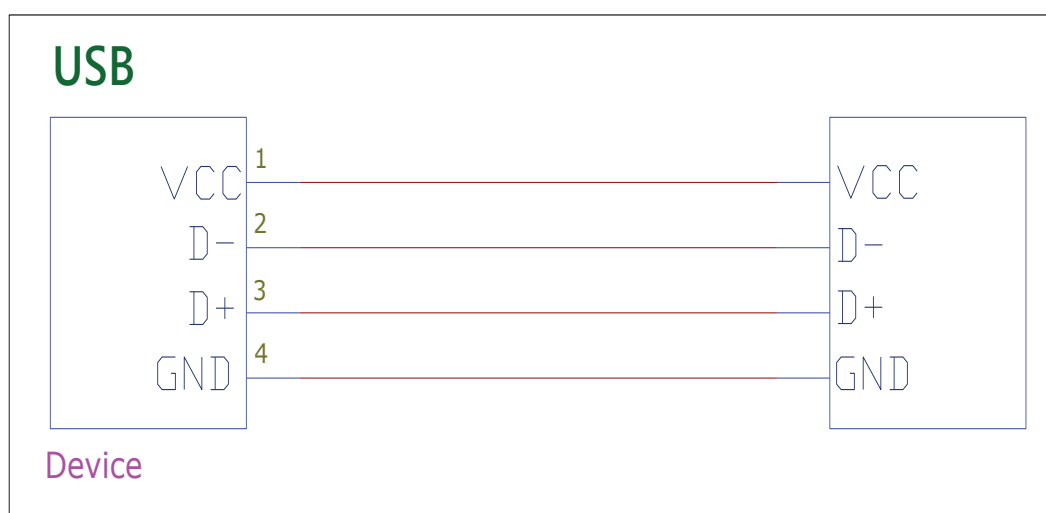


Figure 2. USB interface

PenMount PM1420 Controller Board Data Sheet

JL12 / 7PIN ; ACES 50224-00701-001

PIN NO.	SYMBOL	PIN ASSIGNMENT	
		I ² C	UART
1	VCC	VCC	VCC
2	GND	Ground	Ground
3	SCL / TXD	SCL	TXD
4	SDA / RXD	SDA	RXD
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	3.3	5	5.25	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 PM1420 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 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

PenMount PM1420 Controller Board Data Sheet

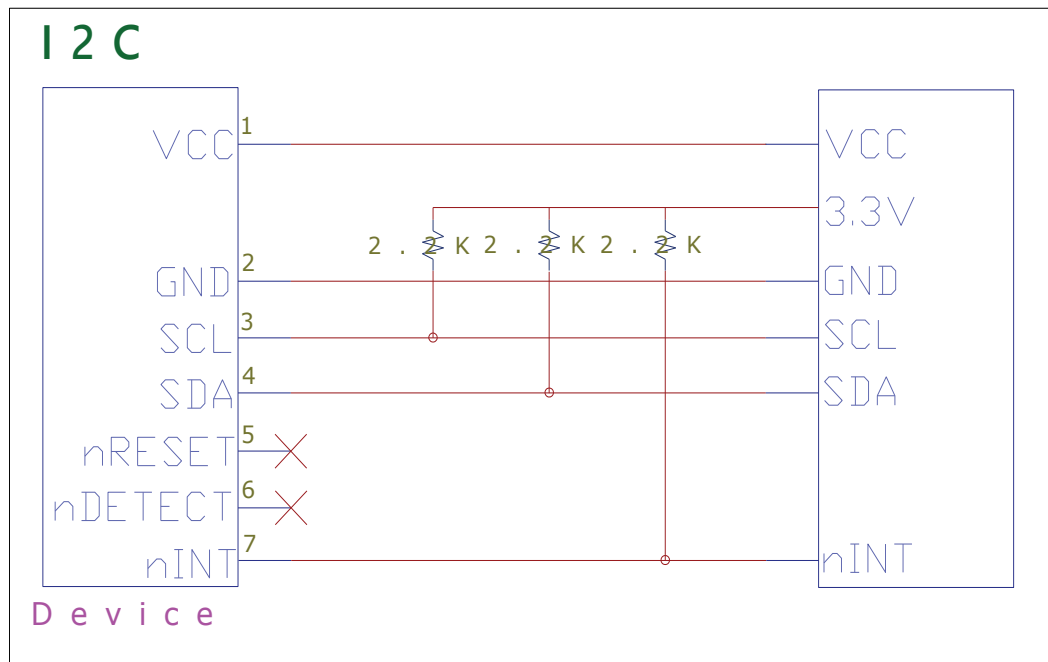


Figure3 I2C interface

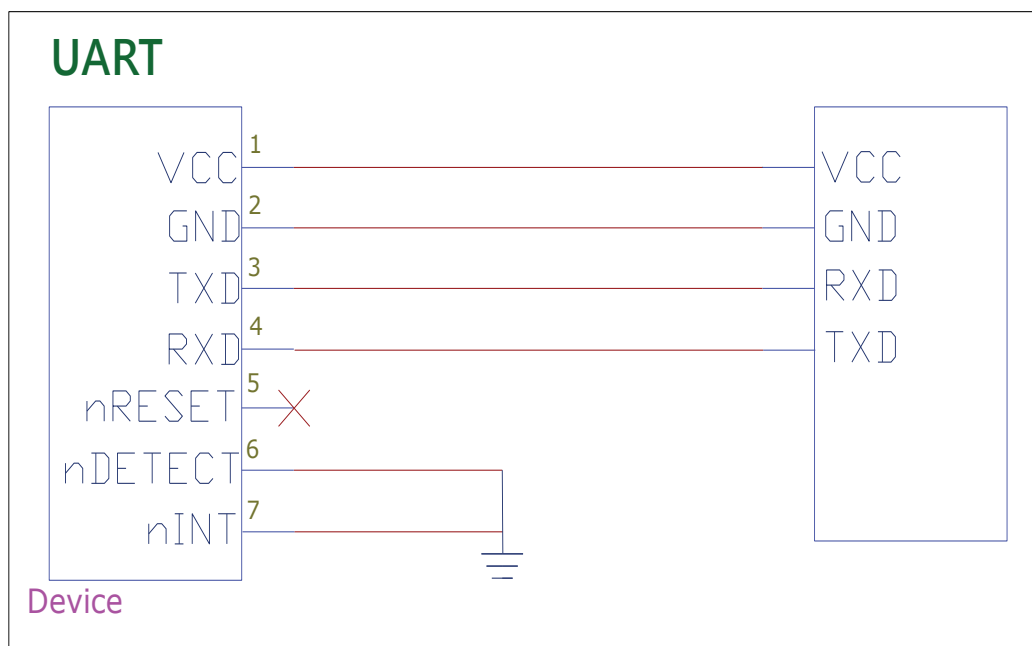


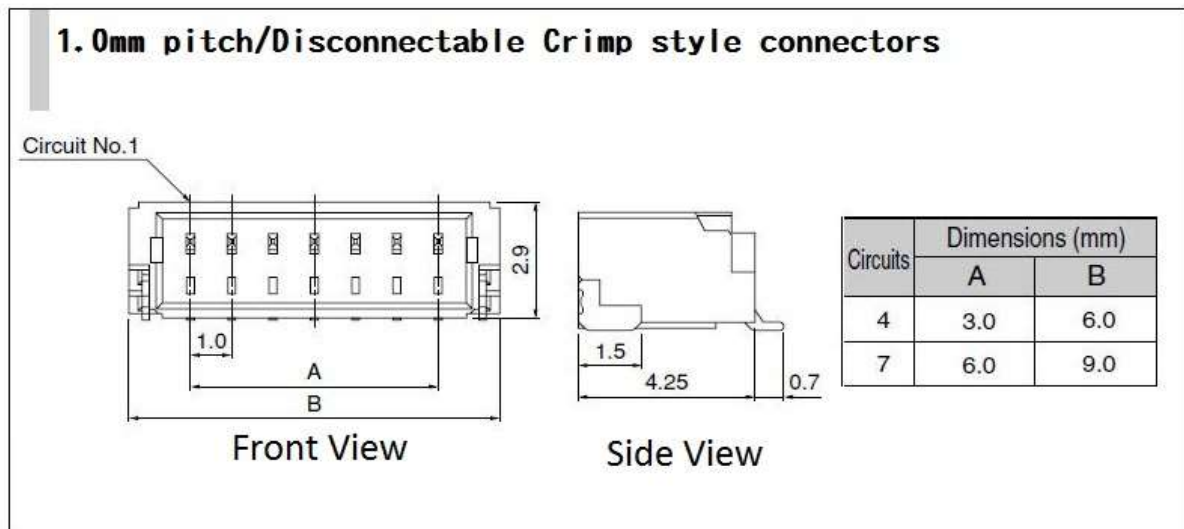
Figure4 UART interface

PenMount PM1420 Controller Board Data Sheet

2.3 Connector specifications

Connector name	Connector function	On-board Connector	Mating connector (JST)
JL11	USB	1 x 4 locking M pin header ACES p/n 50224-00401-001	JST p/n SHR-04V-S-B housing JST p/n SSH-003T-P0.2-H crimp pin
JL12	I2C/UART	1 x 7 locking M pin header ACES p/n 50224-00701-001	JST p/n SHR-07V-S-B housing JST p/n SSH-003T-P0.2-H crimp pin
JL2	40 – pin ZIF touch screen	1 x 40 FFC / FPC conn ACES p/n 51619-06001-001	
JL1	60 – pin ZIF touch screen	1 x 60 FFC / FPC conn ACES p/n 51619-04001-001	

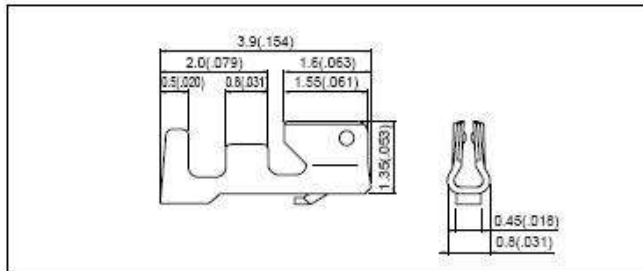
JL11 、 JL12 On-board Connector Specification



PenMount PM1420 Controller Board Data Sheet

JL11、JL12 Mating Connector (JST) Specification

Contact

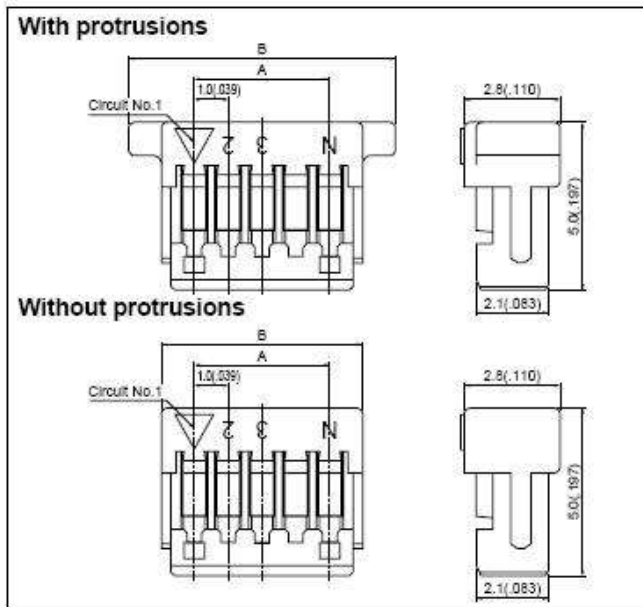


Model No.	Applicable wire			Q'ty / reel
	mm ²	AWG#	Insulation O.D. mm(in.)	
SSH-003T-P0.2-H	0.032 to 0.08	32 to 28	0.4 to 0.8(0.016 to .031)	23,000

Material and Finish
Phosphor bronze, tin-plated

Note: Contact JST for gold-plated contacts.

Housing



Circuits	Model No.		Dimensions mm(in.)			Q'ty / box
			A	B		
	With protrusions	Without protrusions		With protrusions	Without protrusions	
2	SHR-02V-S-B	SHR-02V-S	1.0(.039)	5.0(.197)	3.0(.118)	2,000
3	SHR-03V-S-B	SHR-03V-S	2.0(.079)	6.0(.236)	4.0(.157)	2,000
4	SHR-04V-S-B	SHR-04V-S	3.0(.118)	7.0(.276)	5.0(.197)	2,000
5	SHR-05V-S-B	SHR-05V-S	4.0(.157)	8.0(.315)	6.0(.236)	2,000
6	SHR-06V-S-B	SHR-06V-S	5.0(.197)	9.0(.354)	7.0(.276)	2,000
7	SHR-07V-S-B	SHR-07V-S	6.0(.236)	10.0(.394)	8.0(.315)	2,000
8	SHR-08V-S-B	SHR-08V-S	7.0(.276)	11.0(.433)	9.0(.354)	2,000
9	SHR-09V-S-B	SHR-09V-S	8.0(.315)	12.0(.472)	10.0(.394)	2,000
10	SHR-10V-S-B	SHR-10V-S	9.0(.354)	13.0(.512)	11.0(.433)	2,000
11	SHR-11V-S-B	SHR-11V-S	10.0(.394)	14.0(.551)	12.0(.472)	2,000
12	SHR-12V-S-B	SHR-12V-S	11.0(.433)	15.0(.591)	13.0(.512)	2,000
13	SHR-13V-S-B	SHR-13V-S	12.0(.472)	16.0(.630)	14.0(.551)	2,000
14	SHR-14V-S-B	SHR-14V-S	13.0(.512)	17.0(.669)	15.0(.591)	2,000
15	SHR-15V-S-B	SHR-15V-S	14.0(.551)	18.0(.709)	16.0(.630)	2,000
20	SHR-20V-S-B	—	19.0(.748)	23.0(.906)	21.0(.827)	2,000
Material						

Material
PBT, UL94V-0, natural (white)

Note: SHR-20V-S-B is not CSA approved.

PenMount PM1420 Controller Board Data Sheet

3.0 Drivers and Utilities

3.1 Drivers

For USB

- Windows XP / Vista: OS inbox single-touch driver support.
- Windows 7, 8, 10, 11: OS inbox multi-touch driver support.
- Linux / Android: OS inbox multi-touch driver support.

For I²C

- Windows / Linux / Android :
HID over I2C protocol: Inbox driver support.
PenMount I2C protocol: Provide source code for integration.

For UART

- Windows XP, Vista: PenMount single-touch driver support.
- Windows 7, 8, 10, 11: PenMount multi-touch driver support.
- Linux / Android: Provide source code for integration

Note:

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

3.2 Utilities

Firmware adjustment utility allows user to fine tune the touch panel performance, including set parameters, adjust sensitivity and noise handling, update firmware, etc.

PenMount PM1420 Controller Board Data Sheet

4.0 Others

4.1 ROHS compliance

This control board is ROHS compliant

4.2 EMC protection recommendations

Please refer to PCI touch screen integration guides.

4.3 Noise Protection

To achieve good noise interference protection capabilities, 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.

