PenMount PM2501
PCAP Control Board Datasheet

Version 1.2
2024/2/5

Table of contents

Revision history

Rev.	Date	By	Summary	Remark
1.0	2020/12/15	Willi	New Release	
1.1	2021/2/26	Willi	Correct item 2.0 Specifications Modify Controller part number Modify Supporting touch panel size	
1.2	2024/2/5	Willi	Modify Figure2 I²C interface on page 7	

1.0 Introduction

The PenMount PM2501 control board is a high specification (Projected Capacitive Input, PCAP) touch panel controller product introduced by PenMount. The PenMount PM2501 can be applied in the consumer, commercial and the industrial fields.

The PenMount PM2501 provides USB and I²C interfaces and supports PCAP touch panels sized from 15” to 21.5”. PenMount PM2501 also supports a wide range of operating systems such as Windows and Linux.

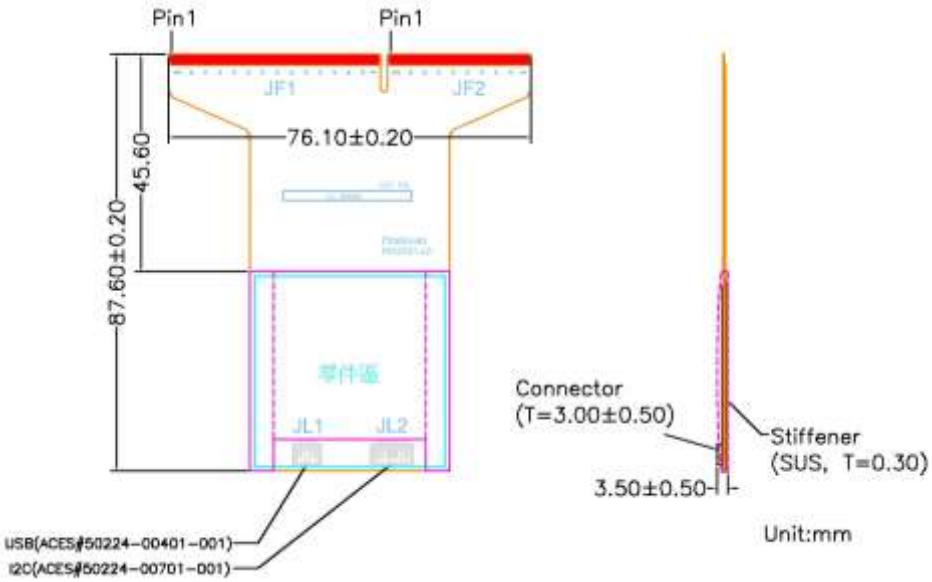
2.0 Specifications

Parameter		feature
Controller part number		PenMount K1-02
Number of sensing line		67
Number of driving line		43
Supporting projected capacitive touch panel size		Projected capacitive type, from 15" to 21.5"
Interface	USB	12Mbps full-speed and 1.5Mbps low-speed
	I²C	100kHz standard mode and 400kHz fast mode
Firmware resolution		16384 x 9600 (Typical)
Response time		Average < 40ms
Sampling rate	One point	110 Hz(Typical)
	Ten points	110 Hz(Typical)
Operating voltage		USB: 4.75~5.25Vdc I²C: 2.97~3.4Vdc
Power consumption	Working mode	175mA @ 5Vdc (Typical)
	Idle mode	45mA @ 5Vdc (Typical)
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
	CS	IEC61000-4-6 Level 3 , Criteria A

Note :
CS and RS performance, power consumption, response time and sample rate will vary according to different firmware versions and parameter settings.

3.0 Mechanical drawing

3.1 Mechanical size



3.2 Touch line pin definition

JF1							
PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	NC	20	Rx50	39	Rx31	58	Rx12
2	System_GND	21	Rx49	40	Rx30	59	Rx11
3	Guard Ring	22	Rx48	41	Rx29	60	Rx10
4	Rx66	23	Rx47	42	Rx28	61	Rx9
5	Rx65	24	Rx46	43	Rx27	62	Rx8
6	Rx64	25	Rx45	44	Rx26	63	Rx7
7	Rx63	26	Rx44	45	Rx25	64	Rx6
8	Rx62	27	Rx43	46	Rx24	65	Rx5
9	Rx61	28	Rx42	47	Rx23	66	Rx4
10	Rx60	29	Rx41	48	Rx22	67	Rx3
11	Rx59	30	Rx40	49	Rx21	68	Rx2
12	Rx58	31	Rx39	50	Rx20	69	Rx1
13	Rx57	32	Rx38	51	Rx19	70	Rx0
14	Rx56	33	Rx37	52	Rx18	71	Guard Ring
15	Rx55	34	Rx36	53	Rx17	72	System_GND
16	Rx54	35	Rx35	54	Rx16	73	NC
17	Rx53	36	Rx34	55	Rx15	74	
18	Rx52	37	Rx33	56	Rx14	75	
19	Rx51	38	Rx32	57	Rx13	76	

JF2							
PIN	Description	PIN	Description	PIN	Description	PIN	Description
1	NC	14	Tx10	27	Tx23	40	Tx36
2	System_GND	15	Tx11	28	Tx24	41	Tx37
3	Guard Ring	16	Tx12	29	Tx25	42	Tx38
4	Tx0	17	Tx13	30	Tx26	43	Tx39
5	Tx1	18	Tx14	31	Tx27	44	Tx40
6	Tx2	19	Tx15	32	Tx28	45	Tx41
7	Tx3	20	Tx16	33	Tx29	46	Tx42
8	Tx4	21	Tx17	34	Tx30	47	Guard Ring
9	Tx5	22	Tx18	35	Tx31	48	System_GND
10	Tx6	23	Tx19	36	Tx32	49	NC
11	Tx7	24	Tx20	37	Tx33	50	
12	Tx8	25	Tx21	38	Tx34	51	
13	Tx9	26	Tx22	39	Tx35	52	

3.3 Interface pin definition

PM2501 includes USB/I²C 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	USB_5V	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	System_GND	Ground		0		V

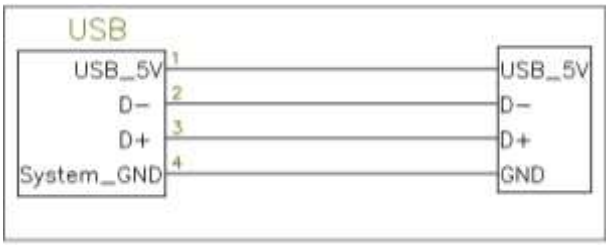


Figure1 USB interface

JL2 / 7PIN / ACES#50224-00701-001						
PIN NO.	I²C	Description	Min	Typ	Max	Unit
1	VCC	Positive power supply	2.97	3.3	3.4	V
2	System_GND	Ground		0		V
3	SDA	Serial data line for I²C. Open drain requires external pull-up to 3.3V.		3.3		V
4	SCL	Serial clock line for I²C. Open drain requires external pull-up to 3.3V		3.3		V
5	INT	Processor Interrupt. This pin is active low, open drain requires external pull-up to 3.3V.				V
6	NC					
7	TP_EN	Chip reset signal. Normal: High, Active Reset: Low		3.3		V

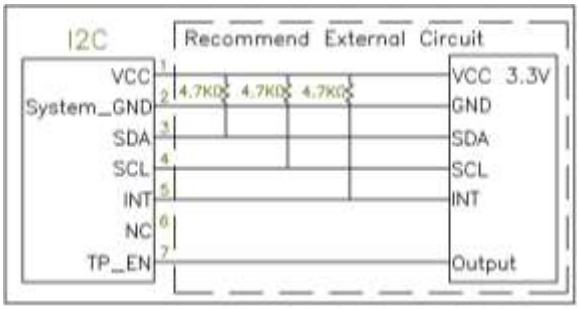
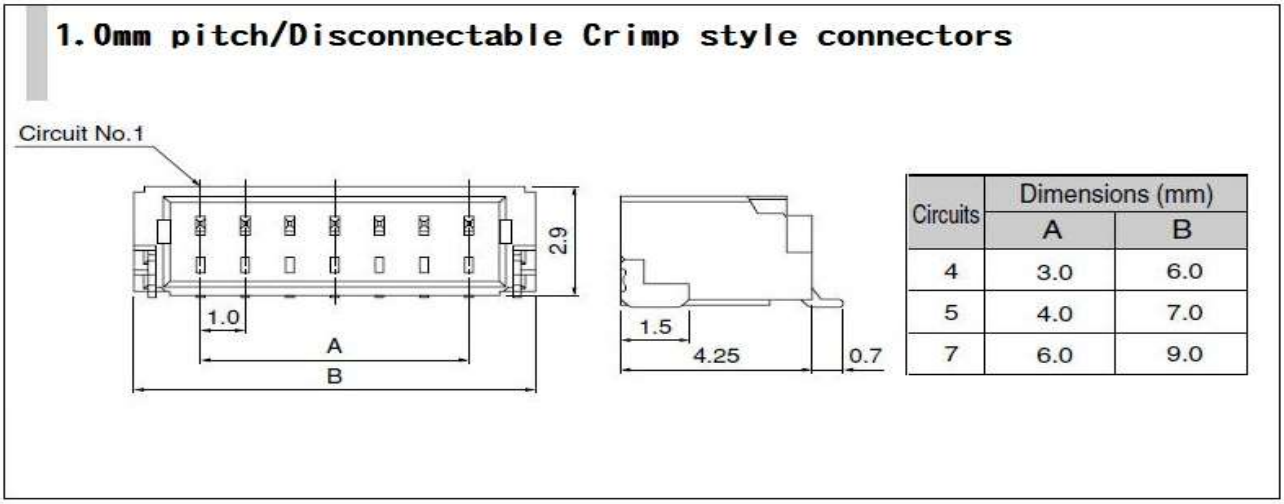


Figure2 I²C interface

3.4 Connector specifications



Circuits	Dimensions (mm)	
	A	B
4	3.0	6.0
5	4.0	7.0
7	6.0	9.0

4.0 Drivers and Utilities

4.1 Drivers

For I²C:

- Windows 8,10: HID over I2C protocol.
- Linux / Android : provide source code for integration.

For USB

- Windows 7,8,10: multi touch, Inbox driver.
- Linux: inbox driver after kernel 3.0.8, provide source code for kernel 2.6.32 ~ 3.0.8.

Note:

Please contact us for further information.

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 PCAP 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 360º 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.