5020D Controller User manual

Version 1.01

Leadingtouch Technology Co., Ltd
HuiLongGuan LongXiang industrial center,ChangPing,Beijing,China
Tel:+86-51090978 http://www.leadingtouch.com
Fax:+86-51090979 E-mail:info@leadingtouch.com

Content

1 PRECAUTIONS

Touchscreen is made of glass material. It's easily breakable from dropping or impact, please handle it with care.

Please pull the plug and contact the sales dealer immediately when you smell a bit of unpleasant odor out of touchscreen.

Please do not plug-in and plug-out frequently when the computer is on.

Please clean the front and rear surface of touchscreen in order to make it best performance.

Please do not screw it tight when mounting the touchscreen (i.e. it is desirably fixed up) for fear of deformation.

Please contact the sales dealer if there are not adequate components to your touchscreen.

New touch screen system comprising of: package contents including touchscreen and PC connection cables, control card, quality-assured card, installation disc including driver and manual.

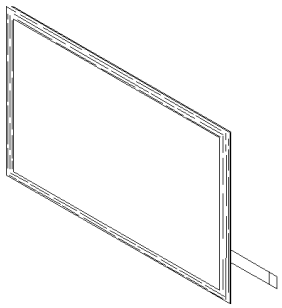
2 Package contents

Touchscreen

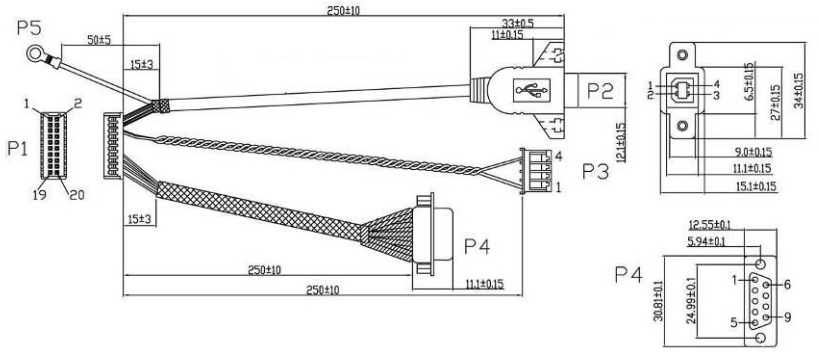
PC connection cables

Control card

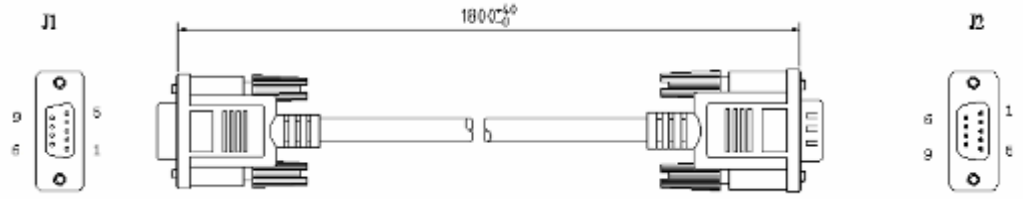
(USB, serial or Comb cable, depending on the model you chose)



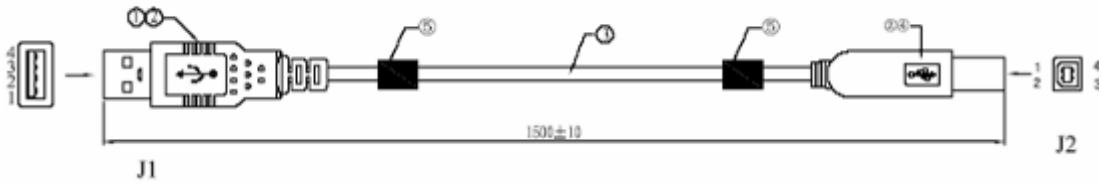
Touchsceen



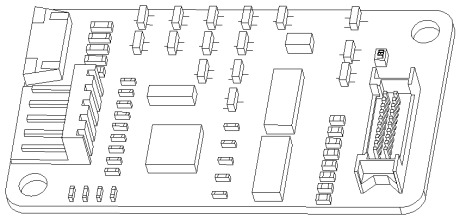
Dual connector cable 14-831-025



Serial extending cable 14-113-180



USB extending cable 14-219-150



Control card 5020D

3 Installing and connecting

Mount touchscreen on monitor and then connect it to PC with cable and control card as following steps

Serial cable connecting

1 · Connect touchscreen 5pin port to 5pin connector of control card.

2 · Connect dual connector cable 14-831-025 20 pin connector to 20pin connector of control card.

3 · Connect serial extending cable 14-113-180 DB9 male connector to DB9 female connector of dual connector cable 14-831-025.

4 · Connect serial extending cable 14-113-180 DB9 male connector to PC DB9 female port.

5. Connect dual connector cable 14-831-025 4pin connector to 5V power supply

6. Connect dual connector cable 14-831-025 GND connector to ground

USB cable connecting

1 · Connect touchscreen 5pin port to 5pin connector of control card.

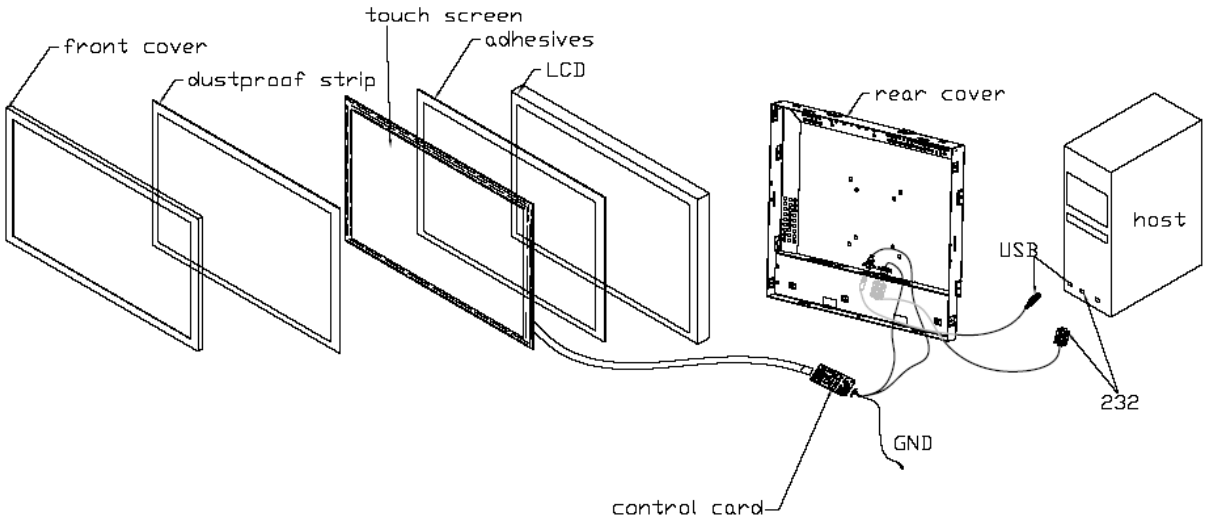
2 · Connect dual connector cable 14-831-025 20 pin connector to 20pin connector of control card.

3 · Connect USB extending cable 14-219-150 male USB connector to female USB connector of dual connector cable 14-831-025.

4 · Connect USB extending cable 14-219-150 USB connector to PC USB port.

5. Connect dual connector cable 14-831-025 4pin connector to 5V power supply

6. Connect dual connector cable 14-831-025 GND connector to ground



4 Physical Characteristics

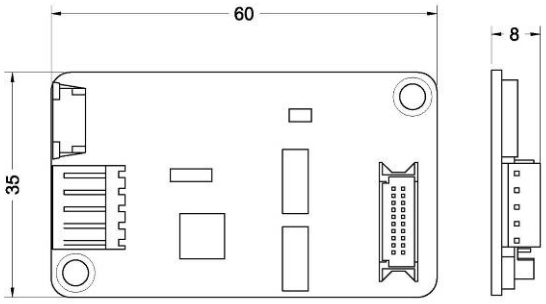
Construction

- Four-layer surface-mount design with internal ground plane for EMI suppression.

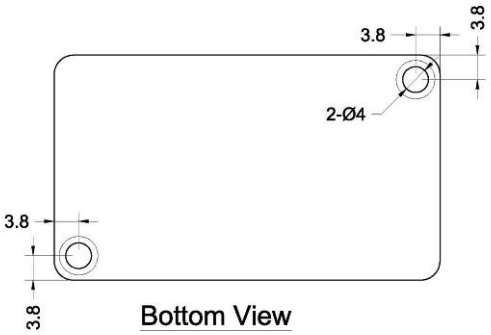
Dimensions

- Total width: 1.38 inches (35 mm), including connectors
- Total length: 2.36 inches (60 mm)
- Total height: 0.3 inches (8 mm)
- All mounting holes are plated through for chassis ground connection.

Dimensions:
Total Length: 60mm
Total Width: 35mm
Total Height: 8mm (including connector)



Top and Side View



Bottom View

5 Electrical

Supply Voltage and Current

- +5 VDC, nominal (+4.50 VDC to +5.25 VDC).
- 50 mA standby, typical at +5 VDC; during touch 160 mA average, 240 mA peak
- Average power dissipation is 0.5 W, typical
- Supply must be capable of sourcing 400 mA, minimum
- Total noise and ripple requirement must be less than 100mV (p-p) for frequencies bleadingtouchw 1MHz, and less than 50mV (p-p) for frequencies above 1MHz.

Serial Interface

- EIA 232E (Serial RS-232), DCE configuration. 8 Data Bits, 1 Stop Bit, No Parity, Full Duplex
- Hardware handshaking: CTS
- DSR is pulled HIGH (>+3V) by the 5020D when connected and powered.
- Note that if the application does not monitor CTS, then an interval of approximately 5 seconds should be inserted between the issuance of a reset command and any other command.

Baud Rate

- 9600

USB Interface

- The 5020D is a full-speed USB device.

The 5020D can communicate over USB and serial port at same time, please make sure only one interface is connected to PC.

Operating Modes

- Leadingtouch protocol
- Customer specific protocol
- Initial/ Stream/ Untouch Modes

Touch Resolution

- 4096x4096, size independent

Conversion Time

- Approximately 10 ms per coordinate set

Reliability

Calculated MTBF is shown as following:

MTBF Method and Temperature	Calculated MTBF
MIL-HDBK-217-F2, ground benign, 25°C	622,699

MIL-HDBK-217-F2, ground benign, 35°C	490,283
Bellcore, 25°C	1,675,705
Bellcore, 35°C	1,294,588

6 Environmental

Temperature

- Operating: 0°C to 65°C
- Storage: -25°C to 85°C

Humidity

- Operating: 10% to 90% RH, noncondensing
- Storage: 10% to 90% RH, noncondensing

Operating Altitude

- 10,000 feet

Shock and Vibration

- Three axis sine wave, 50Hz to 2kHz, 1G, 2 minutes/Octave with dwell on resonances

ESD: Controller Alone

- Per EN 6100-4-2 1995. Level 4
- Contact Discharge - 8kV
- Air Discharge - 15kV positive and negative polarity

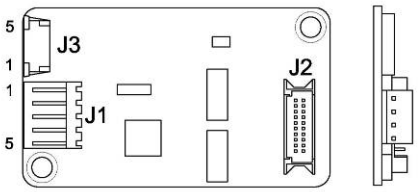
Flammability

The PCB substrate is rated 94V0. All plastic components, such as headers and connectors, are also rated 94V0.

7 LED Indicators

The 5020D controller has one LED status indicators. When 5020D controller initially connects to host, the LED will be constantly on. Then when touchscreen connects to 5020D, the LED will snuff out after 3 seconds and be constantly on during touch.

8 Connectors and Signal Descriptions



CONNECTOR J1&J3

PIN #	SIGNAL NAME
1	H
2	X
3	S
4	Y
5	L

CONNECTOR J2(SENSOR)

PIN #	SIGNAL NAME	PIN #	SIGNAL NAME
1	VBUS	11	DCD
2	GND	12	DSR
3	USB_D-	13	RXD
4	USB_D+	14	RTS
5	VCC(+5V)	15	TXD
6	GND	16	CTS
7	N.C.	17	DTR
8	N.C.	18	N.C.
9	LED	19	GND
10	RESET	20	N.C.

Connector descriptions and pin definition are as following sections.

Power / Interface Connector

The power/interface connector, J2, is a MOLEX 53505-2090, 1.25mm pitch 20 pin, top contact style connector, intended to be used with single wired pins in a 20 pin header. The pins are numbered as shown in Table 1.

Matching header is MOLEX 51127 housing, with MOLEX 50516 terminals.

Table 1 Power/Interface Connector J2 Pin Numbers and Signal Names

J2 Pin	Signal Name	Signal Function	J2 Pin	Signal Name	Signal Function
1	VBus	USB Power	2	GND	Ground
3	D-	USB D-	4	D+	USB D+
5	Vcc	+5V Power	6	GND	Ground

7	-	Reserved	8	-	Reserved
9	LEDN	LED Out	10	RSTN	Reset input
11	DCD	Serial Port	12	DSR	Serial Port
13	NRxD	Serial Port	14	RTS	Serial Port
15	NTxD	Serial Port	16	CTS	Serial Port
17	DTR	Serial Port	18	-	Reserved
19	GND	Ground	20	-	Reserved

Table 2. Serial Interface on Connector J2, Pins and Signal Names

Signal Name	DB-9 Pin	J2 Pin	Sourced by	Signal Function
DCD	1	11	ctlr	"carrier detect", handshake = '0' (POSITIVE) when controller power on
DSR	6	12	ctlr	"data set ready", handshake = '0' (POSITIVE) when controller power on
NRxD	2	13	ctlr	serial data from controller to host
RTS	7	14	host	"request to send", handshake = '0' (POSITIVE) when controller may send
NTxD	3	15	host	serial data from host to controller
CTS	8	16	ctlr	used as "ready to receive", handshake = '0' (POSITIVE) when host may send
DTR	4	17	host	"data terminal ready", handshake = '0' (POSITIVE) when controller may send
RI	9	-	n/u	not used
SG	5	19	com	signal ground

Signal electrical characteristics are given in Table 3, and they comply to ANSI/EIA/TIA 232-F.

Table 3. Serial Signal and LED Electrical Characteristics

Parameter	Value	Signals	EIA-232 Subsec.
Minimum ON state input volts [1]	+3 volts	NTxD, RTS, DTR	2.1.3
Minimum OFF state input volts [1]	-3 volts	NTxD, RTS, DTR	2.1.3
DC Load Resistance	5 kΩ ± 2 kΩ	NTxD, DTR, RTS	2.1.4
Source Impedance (Power Off)	> 300 Ω	DSR, DCD,CTS, NRxD	2.1.5
Power-off condition interpretation	ON condition	RTS, DTR	2.1.5
Output Voltage, Open Circuit	25 volts, max. [2]	NRxD, DSR, DCD, CTS	2.1.6
Output Voltage into test load [3]	>5, <15 volts [2]	NRxD, CTS, DSR, DCD	2.1.6
Short Circuit Current	<100 mA	NRxD, DSR, DCD, CTS	2.1.6
Transition Characteristics	per	NRxD, DSR, DCD, CTS	2.1.7

	EIA-232-E [4]		
External LED short circuit current	0.5mA nominal	LED	N/A

[1] Measured with respect to circuit AB, Signal Ground.

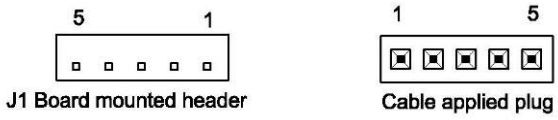
[2] Absolute magnitude.

[3] Output voltage measured over the entire range of test load from 3000 ohms to 7000 ohms.

[4] The transition characteristics comply with ANSI EIA/TIA-232-E while the controller is powered on; during power up and power down some of the criteria will not be met.

Touchscreen Connector, J1, and Signal Descriptions

The touchscreen connector, J1, is a single row by five-position header with 0.025 inch square pins spaced on 0.100 centers, and mates with the receptacle on the Leadingtouch 5W touchscreen cable. The pins are numbered as shown in following Figure. The withdrawal force exceeds 2 lbs.



The touchscreen connector, J3, is a five-position 1mm pitch, SMT, ZIF header, and mates with the FPC connector on the Leadingtouch 5W touchscreen. The pins are numbered as shown in following Figure.

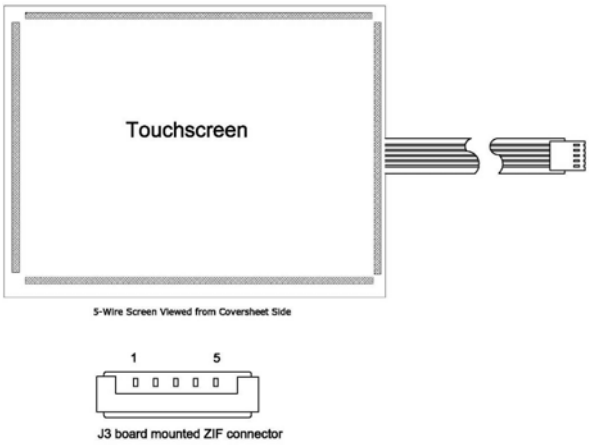


Table 4. Touchscreen Connector, J1 & J3, Pins and Signal Names

J1&J3 Pin	Signal Name	Signal Description
1	H	Drive signal attached to the touchscreen upper right corner when viewed from a user's perspective
2	X	Drive signal attached to the touchscreen lower right corner
3	S	"Sense" signal attached to the touchscreen coversheet

4	Y	Drive signal attached to the touchscreen upper left corner
5	L	Drive signal attached to the touchscreen lower left corner

9 Agency Approvals

The touch system including 5020D controller, touchscreen and connection cable has certified with FCC Part 15.

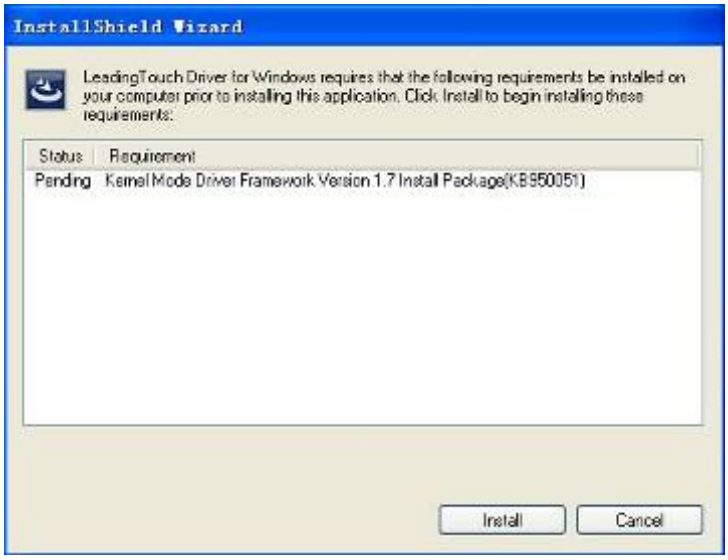
The touch system including 5020D controller, touchscreen and connection cable is compatible with EN55022 and EN55024 standards and is certified with CE.

10 Installing Driver

Start installation

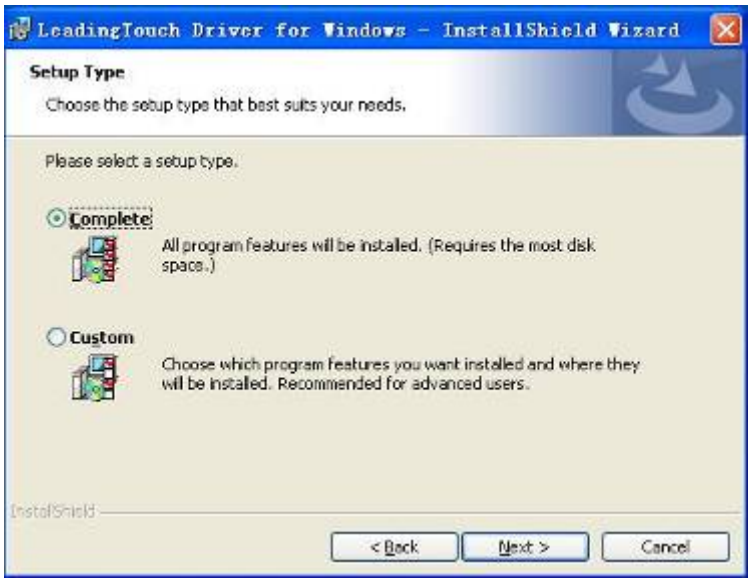
Double click setup.exe file to start installation.

Firstly install resource kit for driver



Choose a installation path, the default path is C:\Program files\Leadingtouch.

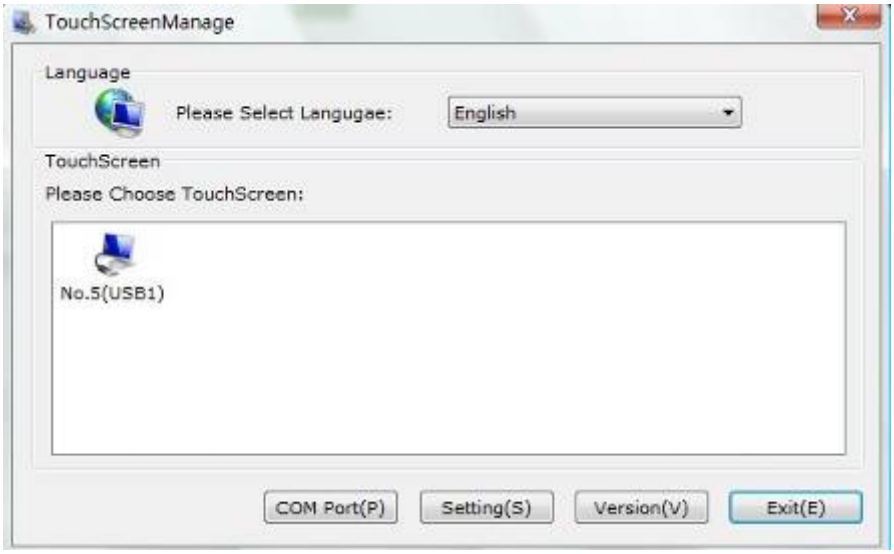
There are two setup type: complete and Custom. The default one is complete type.



After installation, double click LeadingTouchSetup on desktop to enter calibration program.

Introduction to driver setup and function

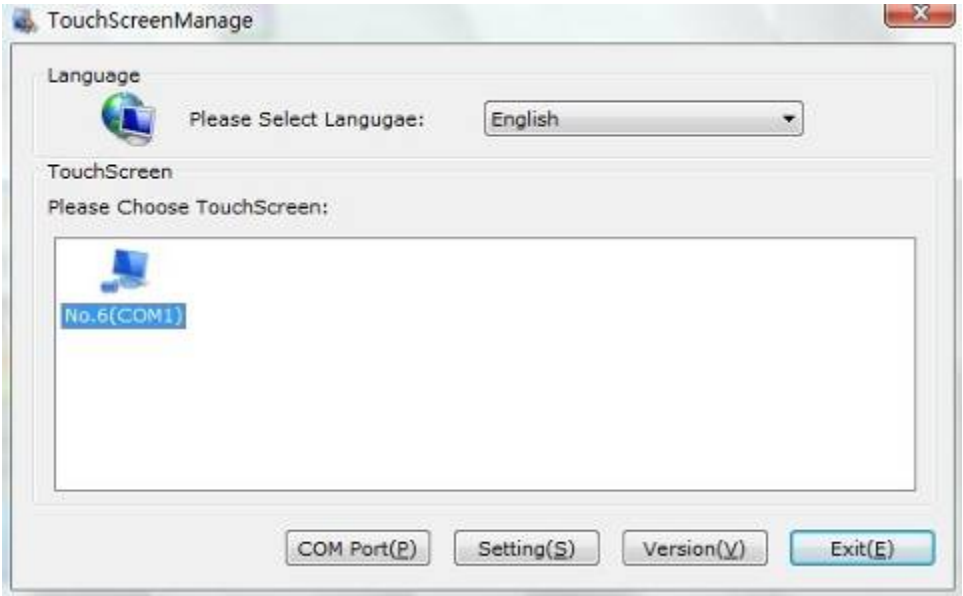
Touchscreen administration interface



Language: can choose interface language, now has two choice Chinese and English language.

Touchscreen: All touchscreen can be recognized is shown in the box, choose the right one calibrate and click Setting(S) to continue your setting.

COM Port(P): For serial interface touchscreen, please select the right COM port for your touchscreen to continue setting(Note: COM interface touchscreen can't not be recognized autoly, user need to select COM port manually and click Add to add touchscreen into computer as following picture shows).

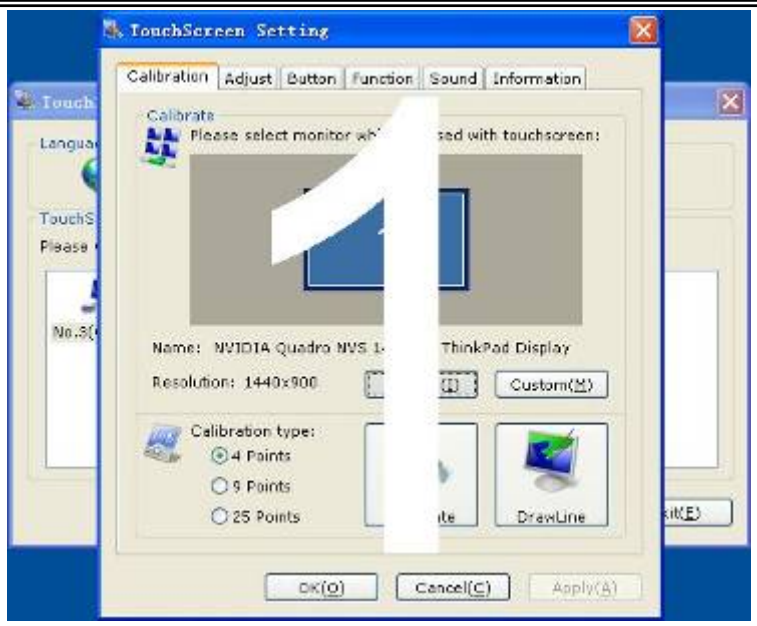


Driver version information

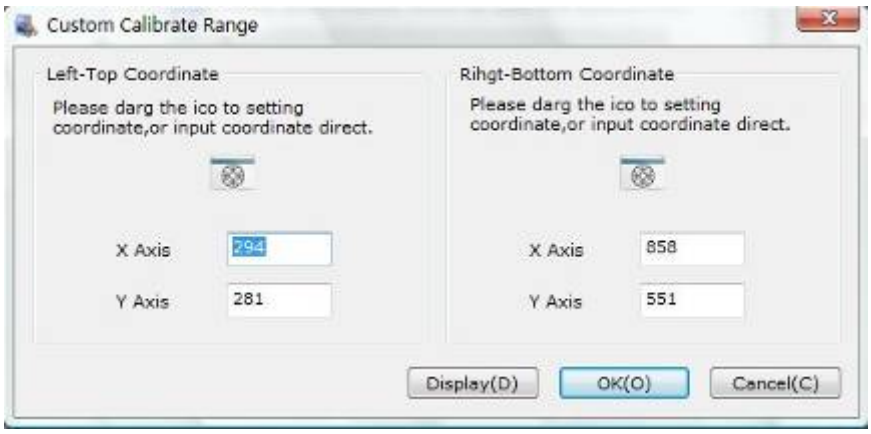
Touchscreen setting

Calibrate: show monitor and resolution information recognized by system

Identify: show monitor information to current touchscreen.



Custom: to define custom calibration area by changing drag Left-Top and Right-Bottom coordinate to set calibration area.



4 points calibration: calibrate by 4 points, for 4 WIRE RESISTIVEand Infrared touchscreens.

9 points calibration: calibrate by 9 points, for 4W, 5W and capacitive touchscreen.

25 points calibration: calibrate by 25 points, for 4W, 5W and capacitive touchscreen.

Select 4 points, 9 points, 25 points or custom and click calibrate to start calibration.

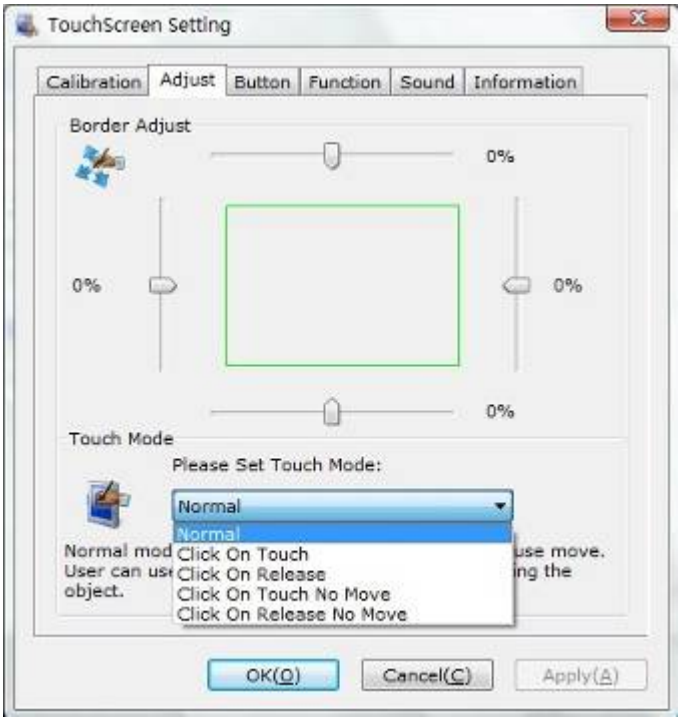
Press the center of red point for about 2-3 seconds. Don’t release your finger until the red point shaft to next position or hearing beep sound. Repeat for all red point to finish calibration.

After calibration, you can choose:

Recalibrate: If mouse cursor can’t overlap with your touch finger, please select this item to calibrate touchscreen again.

DrawLine: Select to enter draw-line test, for more details refer to next chapter

Touchscreen setting- Adjust



Border adjust: adjust screen border scale border to fit current touchscreen, as touchscreen may have abnormal action caused by installation or non-linear problem.

Touch mode:

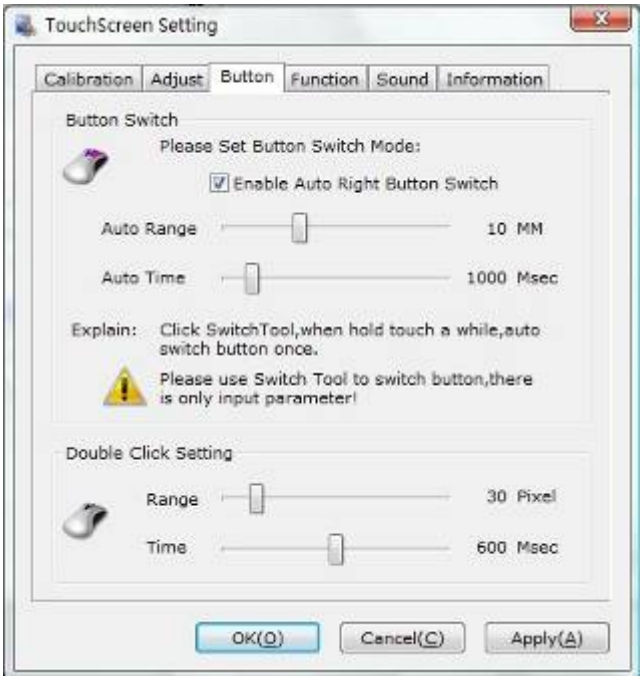
Click On Touch: indicates the response when your finger touches on the panel

Click On Release: indicates the response when your finger leaves the touchs panel

Click On Touch No Move: indicates the response when your finger touches on the panel, can't draw line and drag

Click On Release No Move: indicates the response when your finger leaves the panel, can't draw line and drag

Touchscreen setting-Buttom



[Button Switch]: Enable Auto Right Button Switch

Auto range: Click effectual in 10mm area

Auto time: Click effectual in 1000mMsec

Auto right button effects only when above two items effectual.

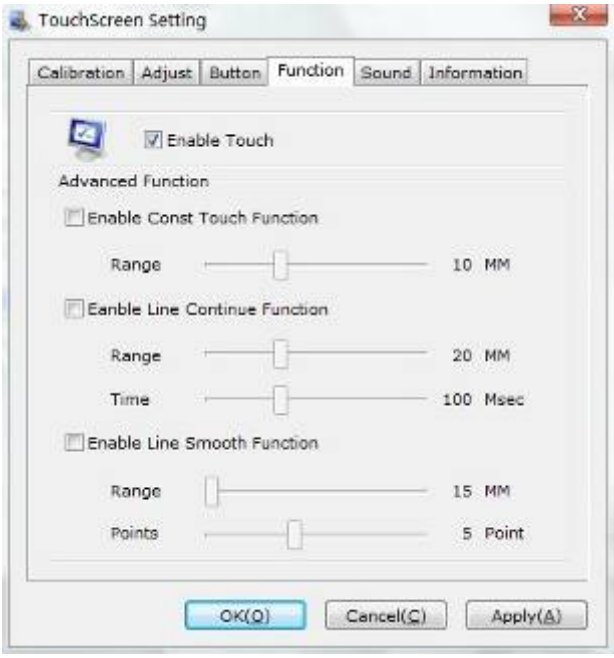
[Double Click Setting]:

Range: Clicks in range of 10 mm are determined to be a touch point

Time: Clicks in 500 msec are determined to be a touch point

If any icon or program can't open normally, please drag the two rules above to right side a little.

Touchscreen setting-Advanced



[Enable Touch]: Enable or disable touch function of touch panel

[Advanced Function]:

Enable Const Touch Function: The range of 10 mm are determined to be a touch point

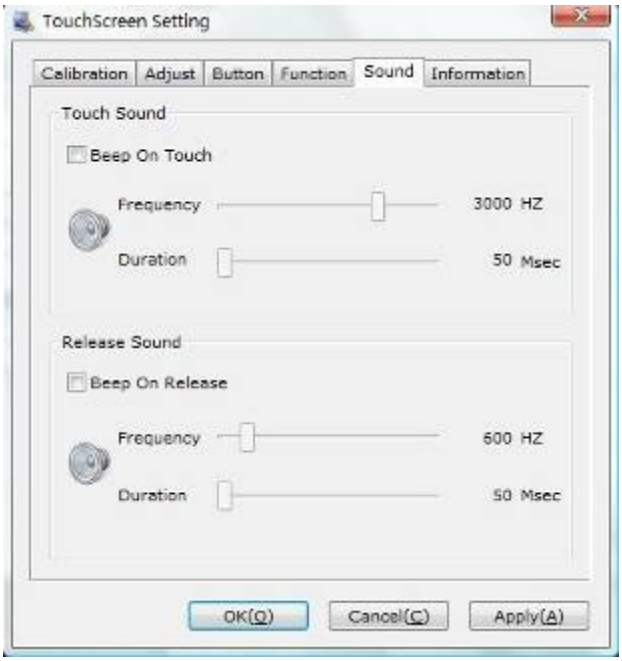
Enable Line Continue Function: Settings for handwriting input or drawing.

Range: Disconnected line in range of 20mm will be amended by algorithm

Time: Disconnected line in range of 100msec will be amended by algorithm

Enable Line Smooth Function: Line can be smoothed by algorithm to insert 5points in 15mm range

Touchscreen setting-Sound



Beep on touch the speaker on the computer will generate voice when touch on the touchscreen

Beep on release the speaker on the computer will generate voice when leave off the touchscreen

Touchscreen setting-Information

[Screen information]

Select: Click to select current touch panel size and model to amending function if mouse cursor not overlap with your finger after calibration. Default size is from 3.5inch to 42 inch

Custom: Click to input a custom touch panel size

[Control Card information]

Indicate Control Card information

Uninstall Leadingtouch drivers

Enter Touchscreen Uninstall program through the following programmer

1 Click "Start"----"programmer"----"Leadingtouch" ----"Uninstall"

2 Open control panel and select "Leadingtouch Driver for Window" ----"delete"

3. Run setup program and select “uninstall”.

11 FAQ

Q: Touchscreen no reaction. LED on control card is constantly on for 3 seconds, then snuff out and be constantly on during touch.

A: Phenomenon below indicates touchscreen and control card are in good condition, you can find out problem as below method.

1: if right driver is installed.

2：If COM port selected in program is the right one in use.

3：If Jumper on control card meet current driver.

4：If COM port of computer can work normally.

5：If computer COM port is in use by other device.

6：If there is any mistake information from operating system.

Solution:

1: Install a right driver

2：Set program COM port as the one in use. 3：Install a right driver. For jumpers and driver corresponding relationship please refer to Jumper setting description.

4：Inspect if Serial or USB port is open in mainboard bios file, if there is any hardware problem(can inspect by serial or USB interface mouth).

5：Change to another serial port or uninstall other device.

6：Change another host or re-install operating system.

Q Touch no action and LED constantly on.

A This indicate touchscreen and control card are not in good preparation, please check following below steps

1 : If front frame interfere with touchscreen active area.

2 : If Control card temperature is too high.

3 : If cable or control card is broken.

Solution

1 : Adjust touchscreen to right position.

2 : Remove control card to ventilated environment

3 : Change another touchscreen or control card.

Q Touch no reaction, LED flickers.

A That indicate a communication mistake between touchscreen and control card. Please settle it as following steps

1 : Check if power supply for control card is unstable.

2 : Check if there is water or other dirty on touchscreen.

3 : Check if cable connected to touchscreen and control card is loosing.

4 : Check if touchscreen and control card is broken.

Solution :

1 : Change another host or adopt a stable power.

2 : Clean touchscreen and restart computer.

3 : Re-connect touchscreen and control card.

4 : Change another touchscreen or control card

Q Touch no reaction, LED is off constantly.

A That indicate there is no current through control card. Please check as following steps.

1 : Check if 232 or USB cable is not in good condition or connection.

2 : Check if power cable is not in good condition.

3 : Check if control card is not in good condition.

Solution

1 : Re-connect cable or change another cable

2 : Change another power cable

3 : Change another control card

Q Cursor not move with finger, has deviation.

A This is caused by inaccurate calibration, please check according to following directions.

1 : Check if calibrate touchscreen uncorrectly.

2 : Check if changed resolution without re-calibration

3 : Check if jumper setting on control card meets current driver

4 : Check if touchscreen is dirty

5 : Check if control card temperature is too high to work normal, and if there is influence from other high frequency device.

6 : Check if touchscreen and control card is in good condition

Solution

1：Redo calibration test, be sure let your finger overlap with red circle center in calibration

2：Redo calibration test

3：Setup right jumper and driver and redo calibration

4：Clean touchscreen

5：Remove control card to low temperature and influence place

6：Change another touchscreen or control card

Q: Cursoer can't move, LED flickerss

A: This usually caused by software mistakes, please solve it as following instructions

1：Check if calibrate uncorrectly

2：Check if jumper setting on control card meets current driver

3：Check if there is water or other contamination on touchscreen surface, or host is hang over

4：Check if adopt unqualified dust-proof strips or assemble touchscreen uncorrectly.

Solution:

1：Redo calibration

2：Make certain driver is correct installed and redo calibration

3：Clean touchscreen and restart computer

4：Adopt qualified dust-proof strips and assemble it not too tight