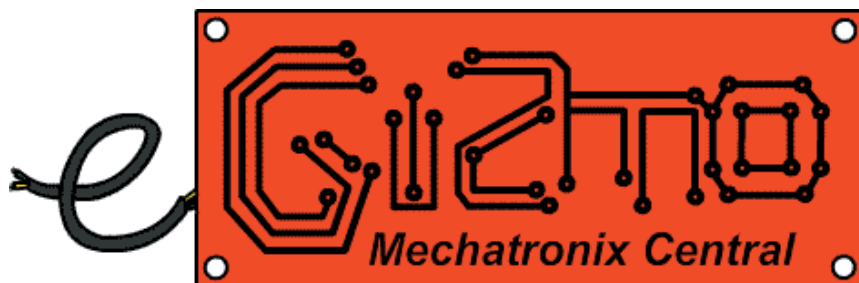
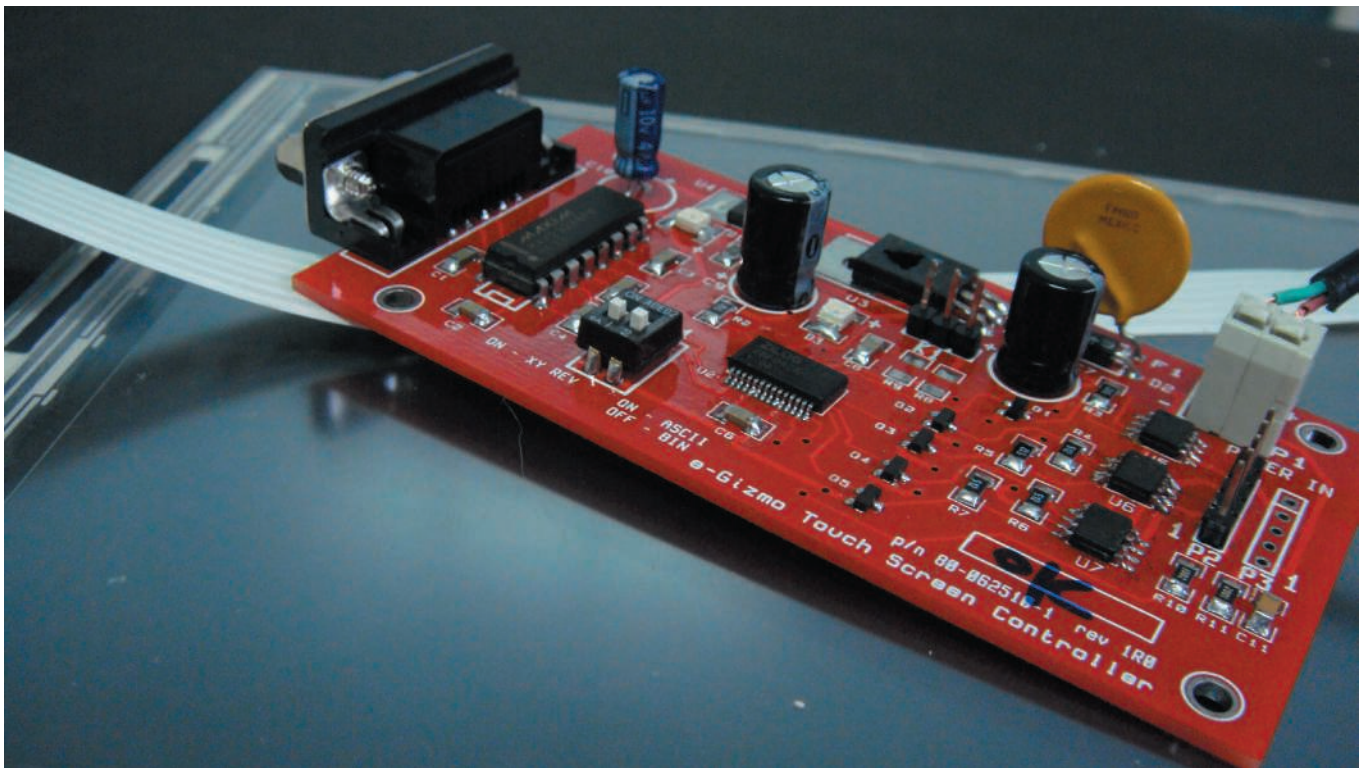


e-Gizmo

TOUCH SCREEN SET

Hardware Manual

for Microsoft® Windows



Touch Screen Set

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Touch Screen Set

Introduction

The e-Gizmo Touch Screen Set is a set of electrical devices that readily provides users and their computers the touch screen technology. In most cases electrical devices with the touch screen technology have the touch screen technology already built-in, which means that the feature is either simply present or absent in devices. However, with the e-Gizmo Touch Screen Set, it is now possible for users to attach and install the touch screen technology on almost any kind of computer. The set comprises of a touch screen panel, the touch screen control circuit board, and a power adaptor, the three components that more or less are the only ones needed to successfully run a touch screen device.

The included touch screen panel is able to withstand mechanical, temperature, and humidity stresses and is also resistant to most substances, especially those commonly found in the household or workplaces such as oils from food or sanitizing alcohol. This ensures protection and longer lifetimes of the touch screen technology from common human lifestyles it made be subjected to.

For users who are experienced or advanced in their knowledge of both computer hardware and software, the Key Mode feature is present in the touch screen control board. With a simple flick of a switch the experienced user will be able to utilize the settings of the touch screen for purposes of programming. This feature is, however, not limited to the experienced. Newcomers to the feature are encouraged to experiment and learn about it to entertain their curiosity or broaden their knowledge provided it is done in a careful manner of course!

Features

- **Installs the touch screen technology on almost any computer.**
- **Touch screen panel resistant to many kinds of substances.**
- **Touch screen panel highly resistant to scratches and abrasions.**
- **Plug-in type device set for easy attachment and removal from computer.**
- **User-friendly default Bit Mode setting.**
- **Available Key Mode configuration for custom programming.**
- **Reverse power polarity protection.**

Touch Screen Set

Specifications

Touch Screen Panel	
Model:	AccuTouch Five-Wire Resistive TF142
Screen Size:	15.0" LCD
Length:	33.2 cm
Width:	24.9 cm
Thickness:	0.4 cm
Panel and Wire Type:	5-Wire Resistive Touch Pad
Symmetry Type:	Symmetric
Input Method:	Finger (Gloved/Ungloved), Stylus Pen
Touch Activation Force:	~113 grams or less than 4 ounces
Chemical Resistances:	<p>Industrial chemicals: acetone, methylene chloride, methyl ethyl ketone, isopropyl alcohol, hexane, turpentine, mineral spirits, unleaded gasoline, diesel fuel, motor oil, transmission fluid, anti-freeze.</p> <p>Food-service chemicals: vinegar, coffee, tea, grease, cooking oil, salt, plus most commercial cleaners including ammonia-based glass cleaner and laundry detergent.</p>

Touch Screen Control Board	
Length:	9.8 cm
Width:	4.8 cm
Computer Operating System:	Microsoft® Windows (XP, 2000, ME, 98)
Resolution:	10-bit
Touch Screen Type:	Resistive 5-Wire
Ports Used:	Serial Comm. Port, USB Port (With Serial-to-USB port converter)
Connection Type:	RS232 D-Subminiature Serial Port (DE-9)

Power AC/DC Adaptor	
Model:	KX-07V0500
Input Voltage:	220 V
Input Current:	50 Hz
Output Voltage:	7.0 V
Output Current:	500 mA

Touch Screen Set

Parts Information - Parts Placement

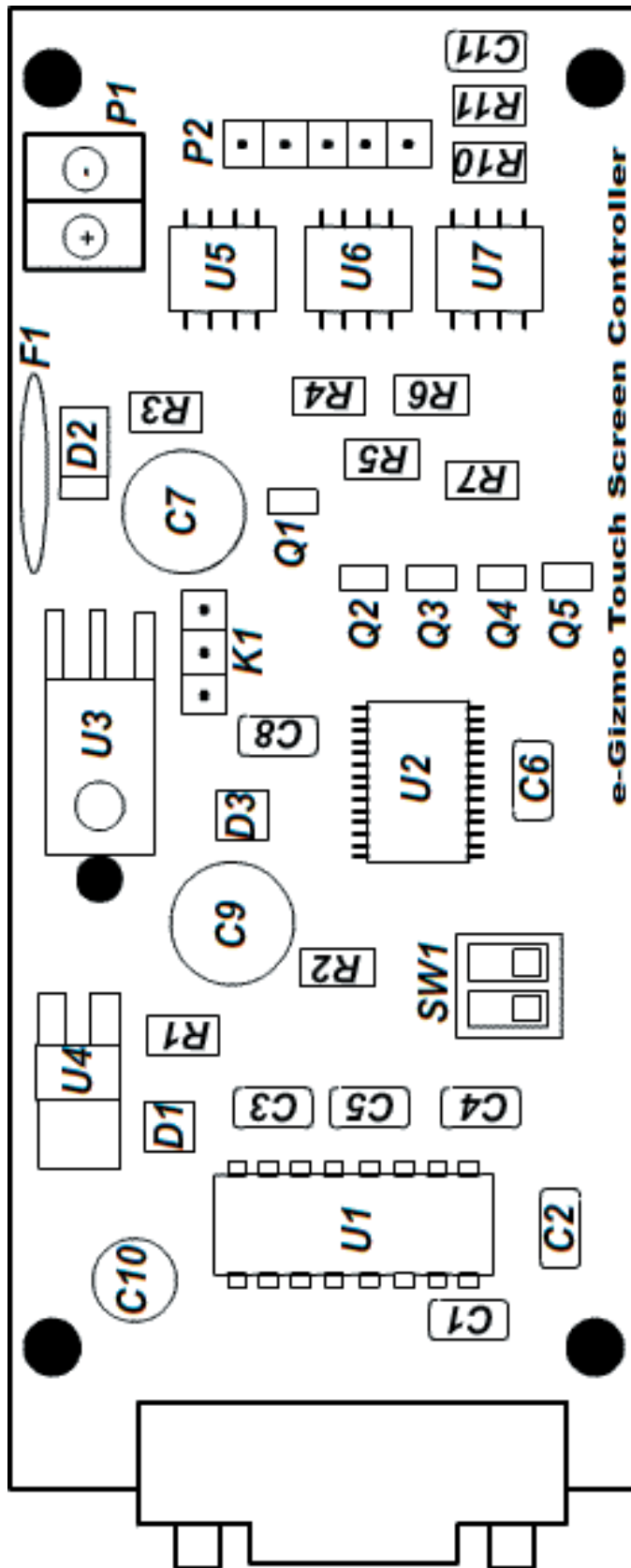
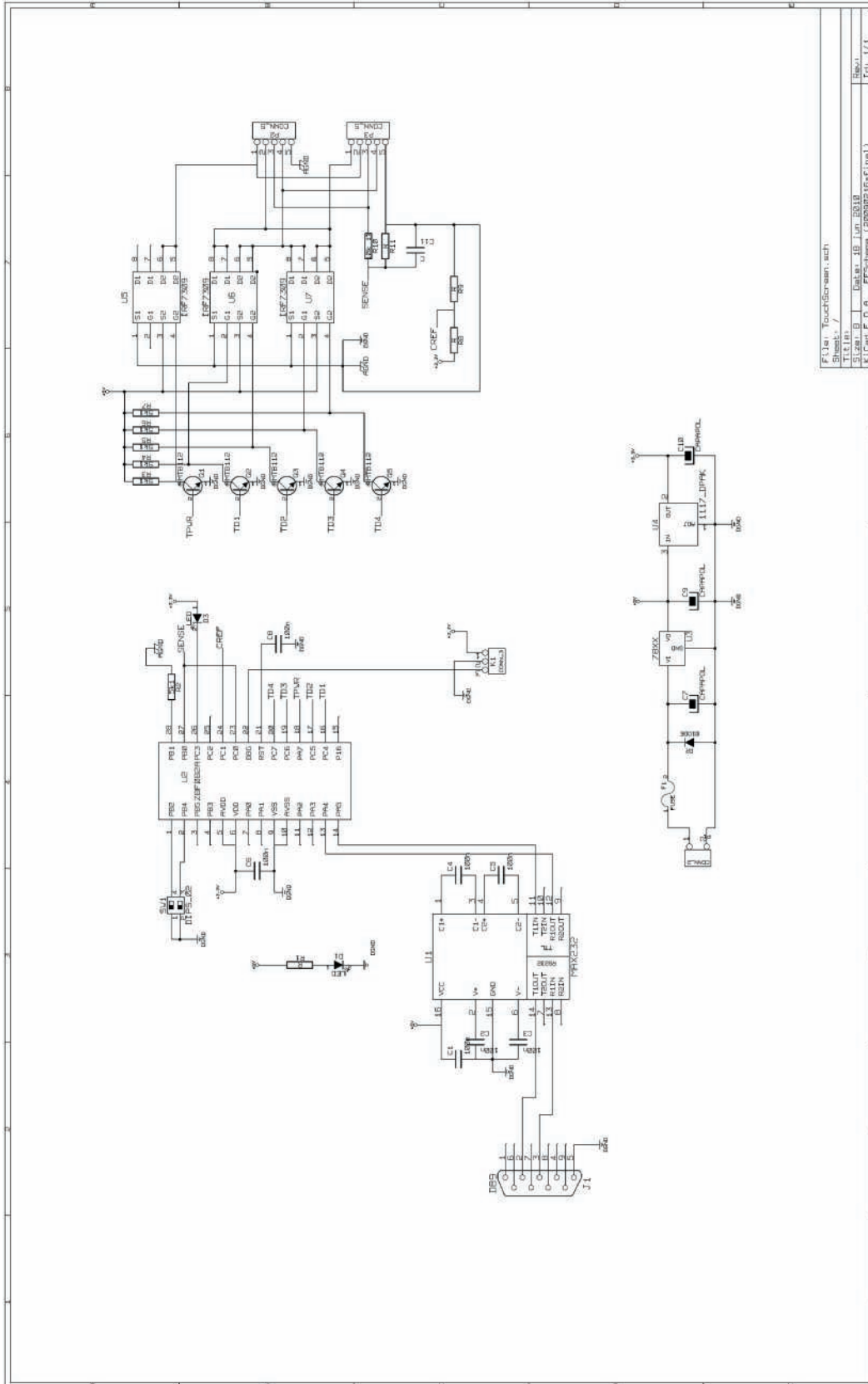


Figure 1

Touch Screen Set

Parts Information - Schematic



Touch Screen Set

Operations - Set Assembly

To assemble the set, the 5-Wire Resistive Touch Screen panel wire terminal is to be connected with the P2 component of the Touch Screen Control Board. Any orientation of the connection of the wire terminals to the 5-pin P2 component does not affect the functionality of either device. For the power adapter, the positive and negative wire endings should already be connected to the P1 component of the control board. Should this not be the case, then while viewing the control board at the position where the "e-Gizmo Touch Screen Controller" label is read properly, the red wire ending from the adapter must be attached to the right junction pin of the P1 component while the green wire ending should be connected to the other side. Interchanging these connections do not pose any risk of damage to the unit, as it is built with an anti-reverse polarity mechanism. However, it should be noted that the unit will not function if the connections are not followed as stated above.

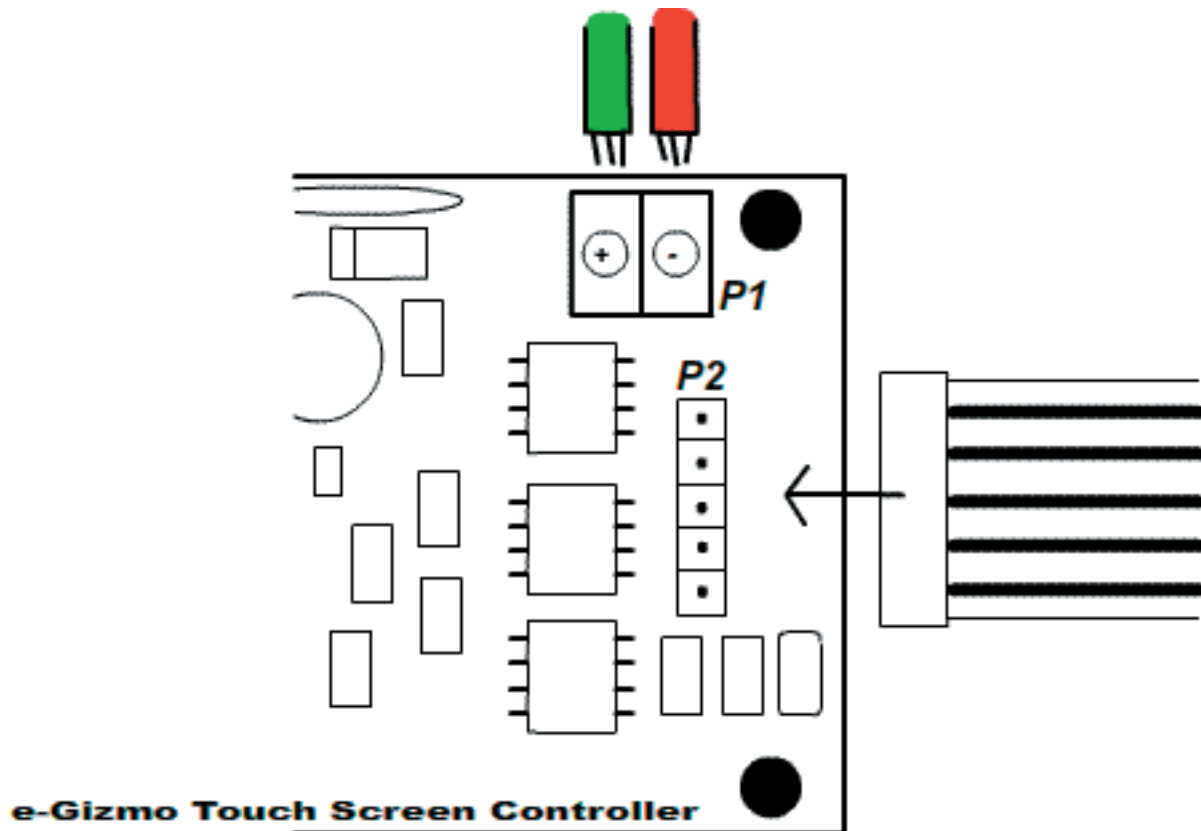


Figure 2

Touch Screen Set

The e-Gizmo Touch Screen Control Board uses the RS232 (female) serial port for its connection to a computer, as such it utilizes the computer's COM ports. These COM ports are the ports seen or considered to be the serial or the USB ports. In order to connect the Touch Screen control board to a serial port a 9-pin D-subminiature male serial cable connector is required. Currently most computers are produced with the USB ports, and it is with this fact that we suggest the use of the USB-to-serial port adapter/converter. For convenience, the mentioned RS232 USB-to-serial port adapter/converter is made available at the e-Gizmo Mechatronics Center (The adapter requires the installation of a driver that is to be discussed later).

Operations - Touch Detection and Panel Placement

Most, if not all of the Resistive-type Touch Screen panel devices are made with two overlapping, transparent layers of uniform high resistance and/or conductive circuits. The mode of operation for the detection of a touch comes from the creation of voltage differences made from the (two) layers of the panel when the distance between them is reduced through the subtle push from a finger or a stylus pen. The top layer must hence be, and usually is, made to be flexible, as this is the layer where the touch is performed and must therefore be able to curve towards the rigid bottom conductive layer to create contact with it.

During a "no-touch" situation, the two transparent, overlapping layers are physically separated through the tight suspension of the top layer. However, when a certain amount of force is applied on the top layer, the two layers come into contact at the specific point of application of the force and a voltage is created. Touch panels whose differences are from the number of wires have their two layers differ from each other as well. For example, a 4 or 8-wire Touch Screen panel uses two resistive layers, whilst a 5 or 7-wire Touch Screen panel uses one conductive and one resistive layer. These differences in layer types and wire numbers results from the different kinds of methods in measuring and detecting the horizontal and vertical positions of the touch applied upon the panel when in use (the X and Y position coordinates of the detected touch).

It is for the same reason that the activation of the Touch Screen is through application of a push on a specific position do we strongly suggest the secure placement of the Touch Screen panel on a computer screen. If the panel is allowed to stand loose on a monitor or LCD, the most common effect of constant application of pressure is the Touch Screen panel's continued displacement. This is indeed a very frustrating problem to keep up with, when every once in a while the user must reposition the Touch Screen panel properly on an LCD during use. In addition, another problem of the unstable attachment of the Touch Screen panel concerning precision and accuracy arises. Initially, a Touch Screen device must first be properly calibrated for positional precision and accuracy of a single touch. If the Touch Screen panel is constantly displaced after calibration, the initial accuracy and precision of the calibration will be lost, even after proper repositioning of the panel. This is because repositioning does not ensure the exact placement of the panel during the time of calibration.

Touch Screen Set

When viewing the computer, the correct placement of the Touch Screen panel on the computer screen is made when the panel side that contains the 5-wire connection is located at the right side of the screen from the user's point of view.

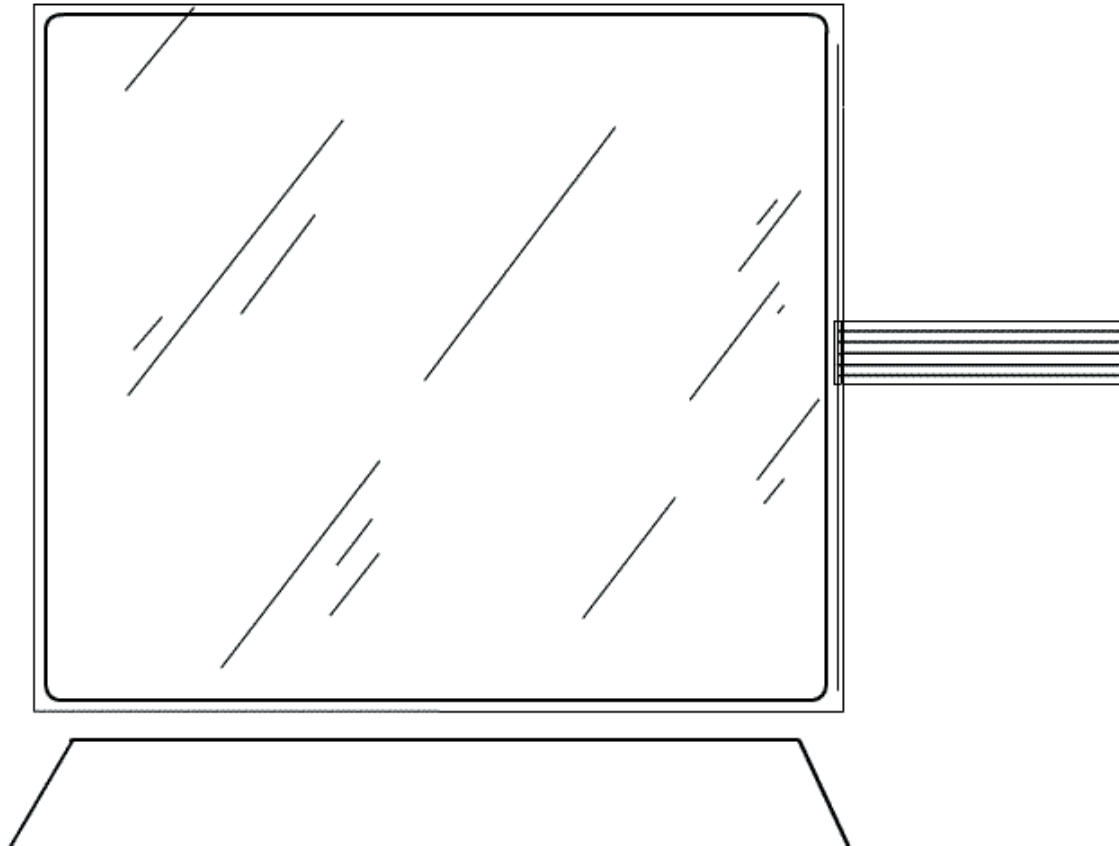


Figure 3 - Panel Placement (Screen View)

The layer that receives the activating touch from the user is that layer in direct connection with the 5-wire cable. As such, it is this layer that should be facing the user while the other (glassed) layer should be facing the computer screen.

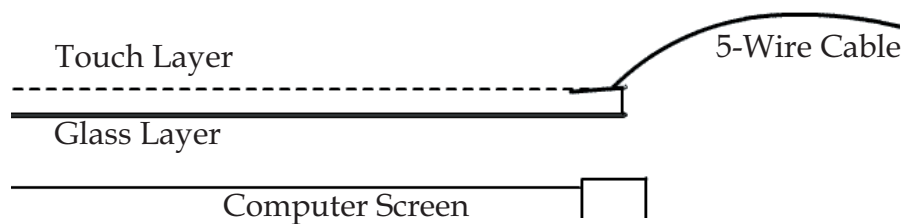


Figure 3 - Panel Placement (Layer View)

Touch Screen Set

Operations - Software Installation and Configuration

To successfully install and operate the Touch Screen device on a computer, whether it be a laptop or desktop, the simple attachment of the hardware to the computer would not simply do. First of all, like most installations of computer hardware, a hardware driver must first be installed. For those who use computers without any serial ports this first step is a must. Inevitably, a USB-to serial port adaptor/converter must be used and the suggested adapter/converter requires the installation of a driver (In this case, the PL2303 USB-to-serial port driver). A driver is a type of software that allows for the proper communication and operation of the attached hardware by the computer and is thus crucial as an initial step in installing any hardware on a computer.

Secondly, an important kind of program that must be installed along with the drivers when handling Touch Screen devices is the Touch Screen calibration program. These programs are needed in order to adjust the accuracy and precision of the Touch Screen with the points of contact made on the Touch Screen surface. Without these programs a touch made on the lower-left area of the panel may result in a "click" in the upper-right area of the computer screen.

Installation Steps

1.) When using the RS232 USB-to-serial port adapter/converter, it is necessary to install the PL2303 driver first, preferably before connecting the Touch Screen device itself. There are different versions of the driver for different operating systems (Microsoft® Windows Vista, XP, 2000, etc.). For those using direct serial cable connections, no such drivers are needed. Some users may encounter errors in reading the USB connector even with the PL2303 driver. If these problems occur, the most likely causes are that the driver is incompatible with the operating system, it is an outdated version, or that the computer may simply need a restart after the driver installation.

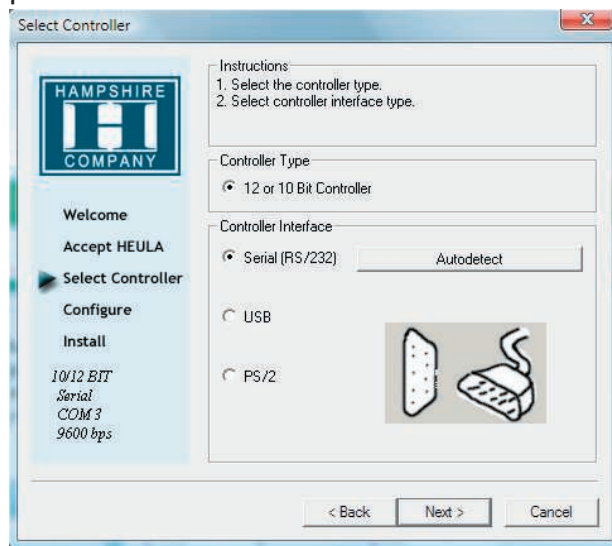
2.) After the driver installation (for those with the USB-to-serial port adaptor), connect the Touch Screen device to a desired USB or serial port. At this point, the user may test the response of the Touch Screen panel by observation of the cursor or events in the computer screen. With or without calibration, the 'mouse' cursor found on the computer screen should move according to touches made upon the Touch Screen panel. Do not worry about whether the cursor follows the position of the touch exactly or not; this is to be expected when the Touch Screen is connected without calibration. What is important is the observed response of the cursor to an applied touch. Besides the observation of the cursor, the D3 (orange) LED will light up so long as a touch is detected on the Touch Screen panel. Both these indicators should help the user test for the correct operation of the Touch Screen Panel.

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3.) Installing the Touch Screen calibration software comes immediately after connecting the hardware to the computer. There are various calibration softwares with different protocols that apply to different Touch Screen systems. The e-Gizmo Touch Screen Set is compatible with the TSHARC Protocol and for our purposes will be using the Hampshire calibration software. (The version shown here is compatible with Windows operating systems XP and below).

First, run the 'setup.exe' executable program and wait for the loading bar to complete. After which a 'Welcome' window should appear. Click 'Next' to move to the 'Software Liscence Agreement'. Once there, check the "I accept all of the terms of the above License Agreement." just below the legal document after reading and understanding the terms of use and click 'Next'.

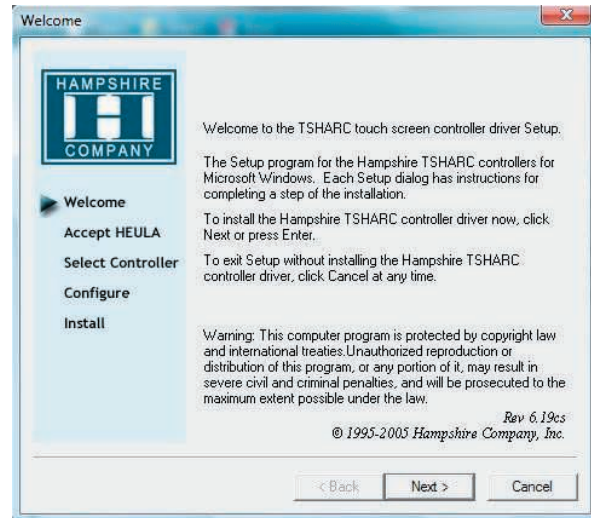
On the 'Select Controller' page, first choose the '12 or 10 Bit Controller' and the 'Serial RS232' option in the 'Controller Interface' pane and click 'Next'.



9600 (default) option and leave the 'Capacitor Controller' unchecked.

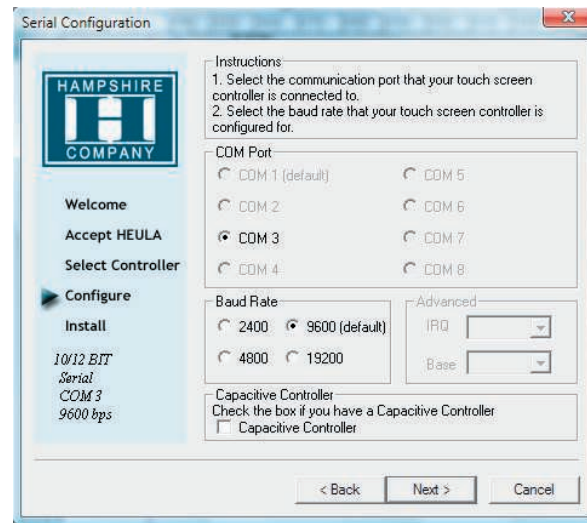
For an easier method, use the 'Autodetect' button found on the 'Select Controller' window. This will report the Bit, COM port, and Baud number altogether. However, this will only work on serial port connections.

Click 'Next' after all the previous steps are made and click 'Finish' to start the installation of the program containing the assigned program configurations.



Once on the 'Configure' page, select the corresponding COM port assigned to the Touch Screen device. Available COM ports will be presented in black text and the bullet selection will be in white, unavailable ports will have both their text and bullet selections colored grey. To find out which COM port the Touch Screen device is connected to, open the Windows Control Panel > Hardware and Sound > Device Manager and open the 'Ports' subsection in the Device Manager window. The connection of the Touch Screen device along with the COM port which it is connected to should be displayed. For the 'Baud Rate',

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Touch Calibration

After installation of the TSHARC program, the next step is to calibrate the touch position on the Touch Screen panel to the position on the computer screen using the program. Run the TSHARC program and click the 'Calibration' tab found at the top of the program window. Select the 'Configure' button to open the possible configurations for calibration.

Calibration type and offset options include:

3-Point Calibration: Quick calibration of a known good touch screen overlay. No correction is applied.

4-Point Calibration: Compensates for skew, and some edge linearity anomalies.

7-Point Calibration: Provides a more accurate calibration than 3-point. No correction is applied.

20-Point Calibration: Provides the highest level of touch screen linearization and skew correction.

Calibration Offset: Because of the varied linearity that exists between touch screens, the user may want to calibrate the edges of the touch screen more precisely. Experiment with this setting to find the best results.

Click "OK" to return to the Calibration screen when finished selecting the desired options.

Touch Screen Set

For an initially simple calibration, use the selected default configuration settings and press 'Okay'. Once back to the 'Calibration' tab, click the small window containing the "target" image. The computer screen will then be completely covered by a plain grey window and the same "target" image will appear on the screen. The task is to press and hold down as precisely as the user can on the target mark until it displays the 'release' text. Once the held pressure is released, another target mark appears elsewhere, and the user is to repeat the process. The process continues up to four times by default until it prompts the user to test the Touch Screen device's positional accuracy and precision with the cursor position on the computer screen.

If the calibration is seen to be satisfactory, click 'Accept' on the lower left-hand corner of the testing window and press 'Okay' on the TSHARC window to finish the basic calibration of a Touch Screen device!

For the other tabs found on the program,

Screen Selection: For multiple monitors, this tab allows the user to choose between the present monitors in which to calibrate the Touch Screen. Once a specific monitor is selected, all subsequent configuration settings will be associated with that monitor.

Click Settings: This feature allows the user to initiate a mouse right-click by holding down a touch point for a specified period of time. To enable this feature click the "Enable right click emulation" box and use the slider bar to set the amount of time needed to produce a right-click event. Click or touch "Apply" to test.

Since it may be difficult to touch and hold an exact point on any touch screen for a length of time, an "event area" is used to establish the size of the area in which a "hold" is acceptable. This event area should be set to an area that is as big as the user's finger tip. The slider bar is used to increase or decrease the event area size, the size of the event area is displayed to the right of the slider bar.

Touch Settings: Click "Enable touch sound" to produce a "beep" when the touch screen is touched.

Touch Options:

Normal: Emulates the actions of a standard mouse, including singleclick, doubleclick, drawing, dragging and right-click option (if right-click is enabled).

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Touch Down: Allows a click event to take place at touch down. The user will not be able to draw or drag if this option is selected.

Touch Up: Touch sent only at touch up. This option disables the rightclick and doubleclick functions.

To Uninstall

To uninstall the program, run the program file tsun10.exe. Simply click 'Accept' and restart the computer when prompted to do so.

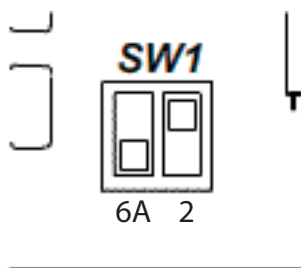
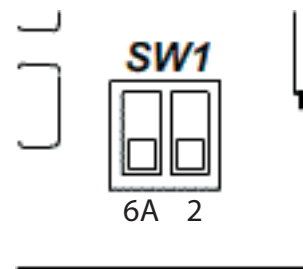
Troubleshooting

Problem	Cause	Solution
Touch screen does not respond.	Controller is not plugged in.	Check connection between the touch screen and the controller as well as between the controller and the computer.
	Touch Screen is not plugged in.	Plug the controller into a different port.
	Driver is not installed or has been uninstalled.	Install/Reinstall the 5-Wire driver (TSHARC).
	Hardware failure.	Contact e-Gizmo.
Touch screen moves, but it does not follow the point of touch.	Controller is not calibrated.	Run the calibration through the installed calibration program (TSHARC).
	The driver is not installed.	Install/Reinstall the 5-Wire driver (TSHARC).
	Touch screen is not plugged in properly.	Verify that the Touch Screen pin-out is correct.
When calibrating, the message "Error in Calibration" appears.	The driver is not installed correctly.	Verify that the controller pin-out matches the touch screen pin-out.
	The touch screen is not connected properly.	Un-install then re-install the driver software (TSHARC).

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Bit and Key Modes

By default the e-Gizmo Touch Screen Controller Board has its SW1 component's switches placed downwards. The resulting mode from this configuration is called the Bit mode. Bit mode is the setting where the Touch Screen system identifies with the TSHARC protocol. This mode is characterized in the SW1 component when the '2' switch is positioned downwards. The reason as to why the Bit mode is chosen as the default mode is because it is this mode that grants all the basic and necessary settings and configurations of a Touch Screen. In other words, it is the "user-friendly" mode where the Touch Screen controller is preset to immediately handle the basic functions of a Touch Screen device.



The Key mode feature, also known as the ASCII mode which is described as the 'Human Readable Output', can be activated by switching the switch '2' to the upward position. This mode is intended for users who have an understanding of translation the touch positions on the Touch Screen panel to dimensional coordinates in the computer. This translation to dimensional coordinates (such as the X and Y coordinates) is mostly expected from programmers handling programs that require the use of the values of the coordinates of a touch on the Touch Screen panel. One of the ways in which this translation of position to coordinates can be seen is through the use of the 'Hyperterminal' application. For example, experienced users using Hyperterminal would have in the application display numbers such as T0450, 0820. This means that the last touch on the Touch Screen were on the coordinates X=450 and Y=820.

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Image References

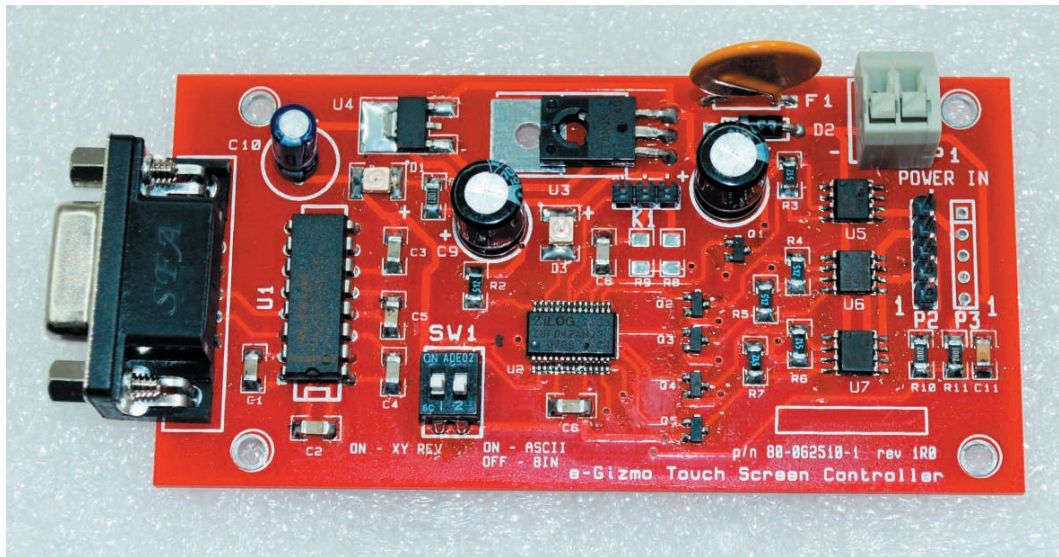


Figure 3 - Control Board



Figure 4 - Touch Screen Panel

Touch Screen Set



Figure 5 - Complete Set

Visit the website at **www.e-gizmo.com** for the latest gadgets and updates on products.

For suggestions or inquiries, contact the e-Gizmo Mechatronics Central Branch via landline (**02-536-33-78**) or via cellular phone (**Globe +63915-973-76-91, Smart +63921-779-07-48**).