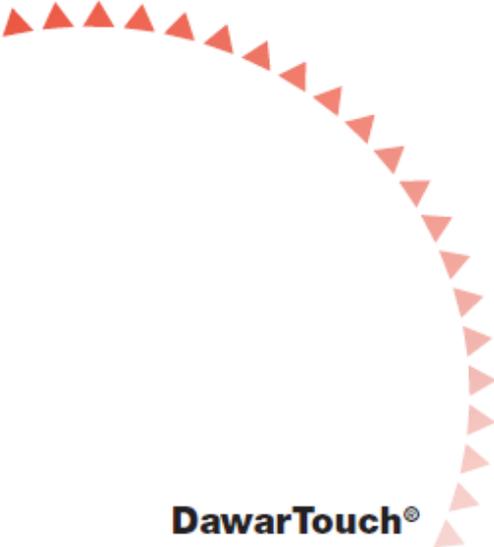


Projected Capacitive Integration Guide



DawarTouch®

1016 N Lincoln Avenue, Pittsburgh, PA 15233 U.S.A.
412.322.9900 ext. 393 / 1.800.366.1904 / Fax: 412.322.9958
Email: touchscreens@dawar.com
www.dawartouch.com



Document Revision History

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Chapter 1	Preparation for Installation
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Chapter 1: Preparation for Installation

Opening Your Container

Before installation, open and check the shipping container for the following necessary components:

- Projected Capacitive Touch Screen
- Projected Capacitive Touch Screen Controller
- Y Cable
- USB or Serial RS232 Cable

Remove components from the packaging to prepare for integration. Handle the touch screen carefully with glass protective gloves. Remove the protective mask and wipe the touch screen with a neutral cleaner and soft cloth as necessary.

Preparing the LCD

Check the condition of the display before you install the touch screen. If the display is working properly, turn off the power and disconnect all cables and power plugs. If required, disassemble the display and prepare tools and material need for installation.

Preparing your Tools and Material

Prepare all the tools necessary for the integration. A list of tools below is a reference to what tools may be needed for the integration.

- Screwdriver
- Screws for controller
- Neutral cleaner and soft cloth
- Single-sided gasket
- Double-sided adhesive
- Washers or spacers
- Knife
- Studs for the controller mounting

Chapter 2: System Integration

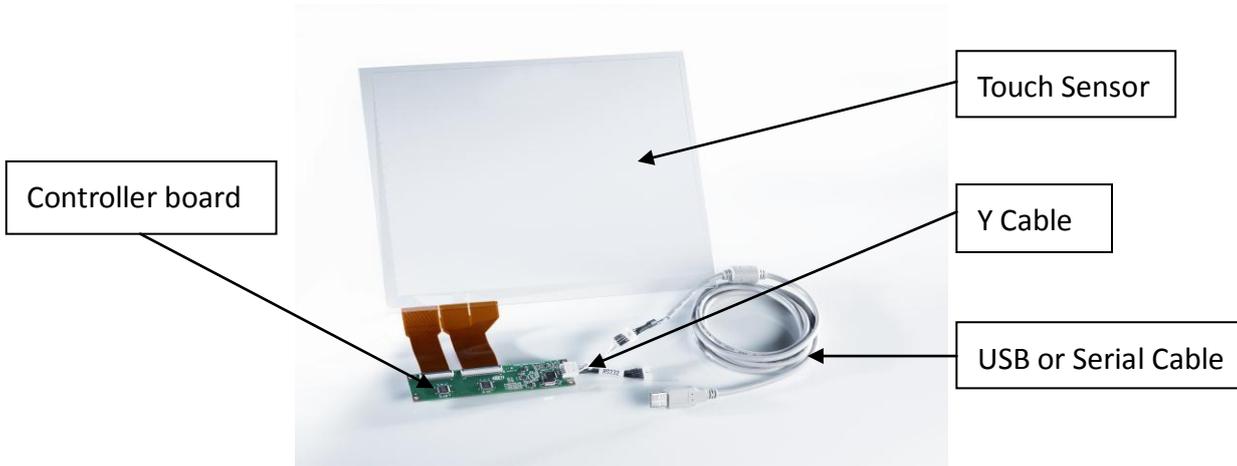


Figure 1

DawarTouch projected capacitive solutions are comprised of 6 different components as seen in Figure 1:

1. Projected Capacitive Touch Screen
2. Projected Capacitive Controller
3. Y Cable
4. USB or Serial RS232 Cable
5. Firmware
6. Driver Software

- Note: In the case of a chip on flex version, you will not have a controller.

DawarTouch projected capacitive solutions also come in a chip on flex version as seen below in Figure 2.



Figure 2

The controller is compatible with the following operation systems. For the specific controller information, please reference the controller specification.



OS	Version	Interfaces
Windows	Windows 7	USB/RS232
	Windows Vista, XP/2000, 9x/ME	
	Windows CE 2.12/3.0/.net/5.0/6.0/7.0	
	Windows Embedded	
	Windows XP Tablet PC edition	
Linux	Kernel 2.4.x and Kernel 2.6.x X=XFree86 4.X and Xorg (up to 1.4.0) Distribution: Mandrake, Mandriva, Fedora, Red Hat, Yellow Dog, SuSE, Ubuntu, Debian, Slackware, Gentoo, Puppy Linux...	USB/RS232/I2C
	Android 4.0 – Google Moblin V2/Meego – Intel Nokia	USB/RS232/I2C
Mac	Mac OS9, Mac OS X (IBM, Intel CPU)	USB
QNX	QNX RTOS v6.5	USB/RS232

Chapter 3: Mounting Guidelines

Appearance

To enhance the appearance of your integrated touch screen do not allow the circuit traces to show. The bezel should be designed in such a way that the traces are effectively hidden behind the bezel.

General Guidelines

- Do not use any metallic interfaces between the rear mounting and front mounting of the touch screen.
- Metal bezels can be used. The Z distance between the metal bezel and touch screen should be tested to ensure proper performance of the touch screen.
- Unlike other technologies, you can mount aggressive adhesive between the touch screen and bezel.
- Front and rear mounting can be accomplished with projected capacitive technology.
- Adhesive can be applied to the active area.

Chapter 4: Mounting Designs

Figure 3 is an example of a rear mounted touch screen.

Rear Mount Design

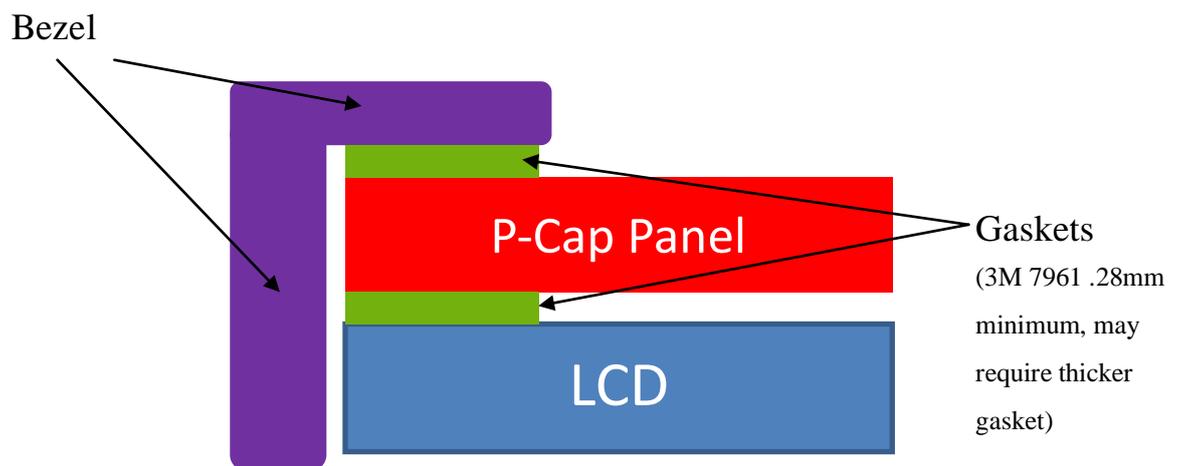


Figure 3

Description

A standard integration is similar to how most resistive and capacitive technologies are integrated today. They require a bezel that wraps around the front of the touch screen for the purpose of support, sealing, and hiding the buss bars around the screen. The touch screen is mounted directly to the frame of the LCD. A non-conductive adhesive is recommended for the gasket. For the gasket interface between the LCD and touch screen, Dawar recommends at least .28mm of adhesive. 3M 7961 can be used for this function. The same adhesive can be used for the interface between the touch screen and bezel. For both top and bottom gaskets, it may be necessary to increase the thickness depending on system noise and bezel material. It is important to use a firm adhesive in both gasket locations. Lateral and up and down movement of the touch screen should be avoided. Spongy, very compressible gaskets should not be used. Gaskets can be applied as continuous or in strip form. Continuous gaskets between the top of the touch screen and the bezel are recommended to avoid ingress of water and debris. The bezel and enclosure can be designed to prevent water from pooling along the edges between the touch screen and bezel.

As described above, the minimum distance between the touch screen and LCD is .28mm, but LCD noise interference could increase this distance requirement. A simple way to experiment is to apply layers of paper or gasket to achieve improved performance.



Always disconnect the USB cable while you insert paper or adhesive and reconnect when complete. The baseline signal of the controller will reset when you disconnect and reconnect the USB cable. Do not touch the sensor while plugging in the controller to the computer. Noise issues can also be improved by firmware tuning. Dawar can provide this tuning service for free, as long as the instrument under test can be shipped to the Dawar factory.

Below are two additional examples of integration solutions. Figure 4 is a Bezel-less Design. Figure 5 is a Front Mount Design.

Bezel-less Design

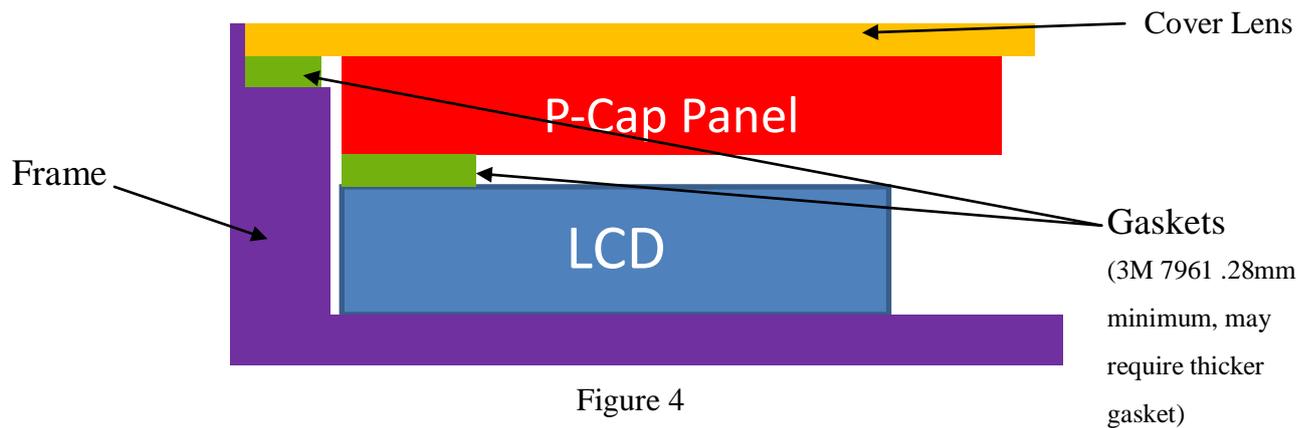


Figure 4

Front Mount Design

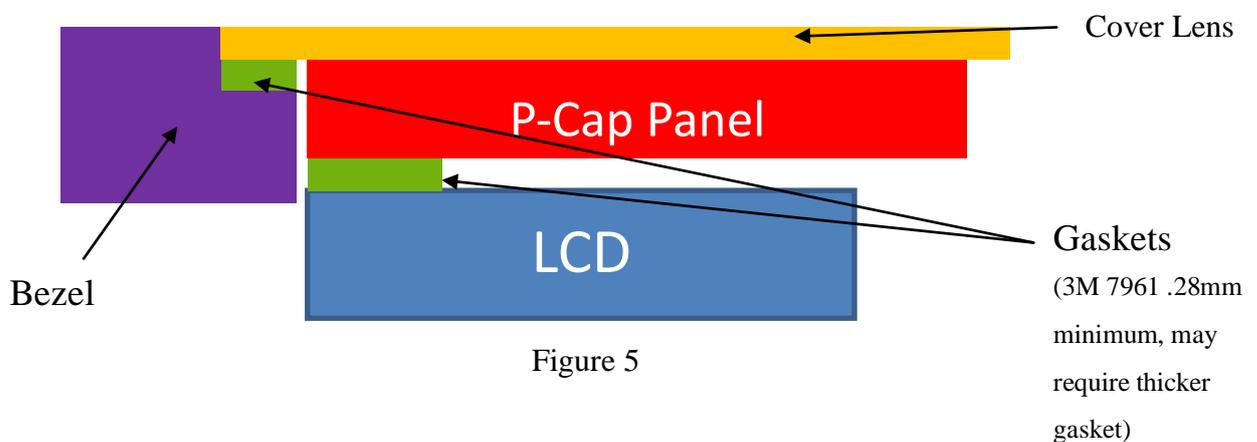


Figure 5

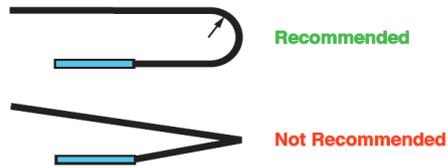
Bezel-less integration is similar to how many smart phones are integrated on the market today. A lens made of glass is bonded to the front surface of the touch screen for extra durability and aesthetics. A frame around the edge of the lens is required for mechanical support. The frame can be made of plastic or metal, but the same guidelines as the rear mount design exist.

Chapter 5: Controller Integration Considerations

Dawar has two controller options for projected capacitive technology. They are printed circuit board with cables and chip on flex (COF). Both options should be properly grounded to equipment ground of the device. The performance of the touch screen will be affected if the controller is not grounded or mounted securely. Keep the controller, FPC, and COF away from the LCD inverter or any device where working frequency is around 50k – 250khz. The controller can operate on various frequencies (85.7khz, 107.1khz, 142.8khz, and 214khz). Do not touch the controller or sensor when powering up the unit through USB. This could cause a false baseline signal.

Chapter 6: Tail Considerations

- Never pick up the touch screen by the tail.
- If necessary, the tail should only be bent once.
- Never bend the tail within 5mm from the panel edge.
- After the assembly of the touch screen and LCD panel, affix the tail to the LCD panel chassis.
- Do not route the tail near the backlight inverter of the LCD panel.
- Position the touch screen tail so that its minimum bend radius is greater than 3.3mm. The tail can be damaged and the warranty voided if the tail is creased. Avoid sharp bends in the tail to ensure best performance.
- It is recommended to keep a distance of at least 2.5mm between the FPC and any metal enclosure.
- Avoid any sharp metal to prevent tail damage.
- Do not bend the stiffener on the tail.



Chapter 7: Touch Screen Basic Mounting Steps

1. Align the center of the viewing area of the touch screen to the center of the LCD display.
2. Use a neutral cleaner and soft cloth to clean the touch screen and LCD.
3. Apply an adhesive to the perimeter of the LCD panel surface.
4. Attach the touch screen to the LCD panel carefully. Make sure there is no dirt, dust or particles between the touch screen and LCD panel.