

Design Guide / Suggestions / Procedures

To assist in obtaining a cost effective membrane switch panel, we offer the following design points to be considered. Most requirements and features can be achieved without a major impact on the price. The suggestions that follow are the best for manufacturing.

Custom key graphics per switch panel: Replaceable

This feature enables extremely cost effective [tactile or non-tactile] customised legends per individual switch panel. A slot at the rear of the top graphic layer is made available so custom printed legends can be inserted behind a pre-determined area. Making each individual switch panel unique;

Tactile Feedback Switches:

IntraAction offer both:-

Stainless Steel tactile switches:

Polymer tactile switches:

These are incorporated into the switch circuit layer and provide a positive, snap-action mechanical click – even when operated when wearing gloves. The actuation force of these domes can be provided in a soft or hard feel.

The Graphic Layer:

This is the part of the membrane switch panel that is the visible at all times to the operator. So it is important to spend time producing the ultimate aesthetic appearance as well as the most practical. As well as the layout, colour combinations are of a prime importance. It is best not to have too many colours – both in appearance and cost. Each separate colour increases the cost. The graphics are screen printed onto the rear or underside of the graphic layer, which is normally polyester.

To further enhance the graphic layer and ease finger location, selective embossing is suggested.

Rim Embossing – is a ridge around a switch position – to assist finger location.

Pillar Embossing – is a raised area over the entire switch position – again to assist finger location.

The Switching Circuit:

The switching circuit will be designed to comply with your circuit requirements in the most economical way, with the minimum crossovers.

The vast majority of membrane switch circuits are produced incorporating a polyester substrate and printing the required circuit tracks using silver and/or carbon inks; this involves a “Silk-Screen Printing Technology”. There are certain limitations to “Silk-Screen Printing” onto polyester – this technology produces a minimum circuit pitch of 1mm. However, IntraAction Technology is able to offer a reduced minimum circuit pitch by incorporating a “flexible” Polyimide circuit substrate. Incorporating traditional subtractive PCB technology;

The Output Tail:

The position of the output tail is often pre-determined by requirements at the rear of the front panel, however; if at all possible restrict the length of the tail to within the dimensions of the membrane switch panel. IntraAction recommend clincher type connectors manufactured by Nicomatic. IntraAction will fit these, thus reducing additional work when the membrane panel is received and is normally included within the price quoted for the supply of the membrane switch panel.

Alternatively the tail end can be completed ready for insertion into a "ZIF" [zero insertion force] PCB mounted connector. This offers the lowest cost option.

Whilst the output tail is flexible, it should never be bent and creased i.e. attempt to obtain a sharp angle bend. The minimum radius for any tail bend should not be less than 3mm.

LED Integration:

Embedded SMT LED's are now a very cost effective method of introducing illuminated indication into a custom membrane switch panel. This eliminates the need for rear mounted LED PCB's. Normally, this feature is used as an independent light window. However, a recent development by IntraAction, when incorporating an FR4 rigid PCB membrane switch assembly, has produced an "in-line" switch position LED indication. This provides LED back lighted switch position graphics.

Display Windows:

Display windows can be incorporated with the membrane switch panel. The polyester front graphic layer produces an extremely cost effective and good quality window. Rigid window material such as PMMA, Tough Glass etc can also be incorporated within both flexible and rigid membrane switch panels. Windows can be clear or tinted

Mechanical Restrictions:

There are certain mechanical restrictions within a membrane switch panel, we highlight the most important:-

Windows:

- Edges of windows should be a minimum of 3.00mm from edge of membrane switch panel.
- Edges of windows should be a minimum of 4.00mm from edge of switch positions.
- Edges of windows should be a minimum of 9.00mm from centre of SMT LED's.
- Edges of windows should be a minimum of 2.00mm larger the cutout dimension – all dimensions.

Switches:

- Edge of switches should be a minimum of 4.00mm from the outer edge off the membrane.
- Edge of switches should be a minimum of 2.00mm from outer edge of SMT LED area.

Tail:

- Output position from rear should be a minimum of 3.00mm from edge of the membrane.

LED's:

- Centre of SMT LED's should be a minimum of 8mm from edge of the membrane.

Support Plates / Backing Plates:

Various materials are available to produce support plates / backing plates, most forms of metal, including aluminium, stainless steel and mild steel. Resin based materials, glass and Phenolic materials.

Suitable materials can incorporate insert studs, cutouts, and holes.

Computer Files:

IntraAction can accept drawings or sketches in AutoCAD & Corel Draw. If in doubt please send all file formats.

Other formats acceptable are – TIF, GIF, and JPG, but may create problems when trying to reproduce custom logos. Original artwork is required if a unique logo is required to be reproduced.

Quotations /Offers:

All quotations and offers from IntraAction are based on drawings, sketches or samples supplied. Changes to design when placing order may be subject to a price review.

The provision of fully detailed drawings in Corel Draw or AutoCAD formats can significantly reduce the cost of developing a custom membrane switch panel.

ORDERS:

Once IntraAction receives an order – An order-received acknowledgement is issued, all details i.e. drawings and specifications are then checked against the original specification. Discrepancies are then rectified. The project is then passed to our Production Design Department and a set of drawings and specification is then produced. When this is complete and signed off, these drawings are sent to the customer via IntraAction Electronics Europe for approval prior to manufacture. Once the customer has given authority in writing [email acceptable] manufacture commences.

IntraAction provides service beyond the sale.

Therefore we are interested in our customer's feedback on the following:-

- [a] The initial way your inquiry was handled!
- [b] The speed and quality of the quotation!
- [c] The delivery time against the delivery time quoted!
- [d] The condition of the product on delivery!
- [e] The quality of the product – was it as you anticipated!
- [f] Did we meet your expectations? Or better your expectations?

We shall follow up on all deliveries – to ask these questions, so please spare us the time, so we can make amendments to our procedures where required.