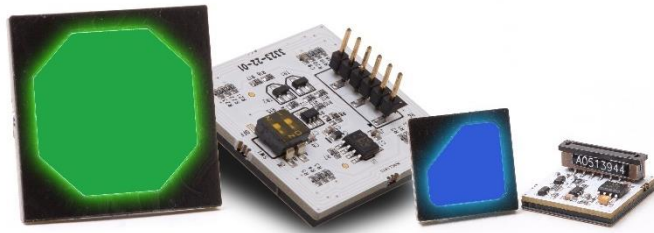


## Make the Brake from Electro-mechanical Switches to Capacitive Switches



Every electrical and electronic product and increasingly industrial equipment and domestic appliances require some form of control, commonly referred to as the Human Machine Interface (HMI).

For many years the simplest, most reliable and lowest cost option has been an electro-mechanical switch of some kind. As equipment gets more complex, so do the number and type of switches required, for example the evolution of a rotary switch for hard-wired function selection to the latest rotary encoders for digitally controlled products.

In some applications illumination may be required to show function status, for use in low light or noisy conditions or to signal a fault condition. An LED incorporated into the switch is the most common means of illumination, frequently making the switch itself larger, requiring power to be supplied to the switch and in the case of illuminated control shafts, requiring a translucent control knob.

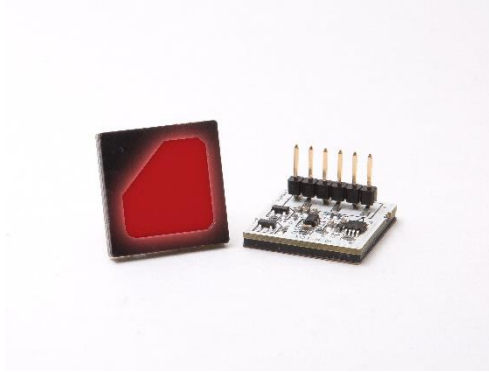
The task of the designer has been to accommodate all the various switching types and functions into a single ergonomic and aesthetically pleasing control panel, not always an easy task. The use of discrete switching components complicates control panel design, increases the number of components and quite possibly suppliers on the manufacturing BOM and increases the time required to manufacture and test.

There has been a major change in HMI fuelled by the rapid growth of smart phone and tablet sales featuring touch screen technology. Initially the domain of consumer equipment, those same consumers now expect industrial and domestic products to offer the look, feel and convenience of their tablet. A requirement not lost on the marketing departments of industrial OEM's who are always seeking a way to differentiate their products from competitors.

At the same time increased use of digital technology has meant less reliance on electro-mechanical switches. New micro-processor-based systems offer OEM's not only smaller, lower cost of manufacture products but also provide a means for external or remote control and diagnostics. New digital designs can incorporate machine-to-machine (M2M) communication making them ready for access to the internet-of-things (IoT)

Clearly, moving a conventional HMI interface using readily available electro-mechanical switches to a custom designed touch screen is a big step which may involve complicated design and development costs. And not all OEM products will benefit from a touch-screen solution.

**How does a design engineer evaluate the cost/benefit or even feasibility of developing a touch-screen solution?**



TT Electronics provides market leading 'off the shelf' LED Backlit Capacitive Switch Modules in component form which allow designers to evaluate touchscreen technology and even manufacture simple control solutions.

This technology is usually only available as part of a custom design package. The switches feature TT's innovative method of combining the benefits of capacitive switching with multi-colour area-specific backlighting.

Available in 20mm and 35mm diameter versions the capacitive switch modules are suitable for mounting into panel thicknesses of up to 7mm and 11mm respectively. The full RGB LED illumination provides a high brightness user touch area with unmatched uniformity of illumination. The solid-state switch design has a non-latching output of 40mA maximum operating from a supply voltage of 6VDC to 28VDC. The 35mm version offers designers adjustable low, medium and high touch sensitivity to suit the application. The operating temperature of the switch modules is 0° to 50°C

TT's patented thin-film LED backlighting is a major selling point for our custom designed capacitive switch-based control panels. For smaller projects a custom panel may not be appropriate, and these stand-alone products enable simple integration and means to prototype and evaluate HMI designs without the need to develop custom capacitive sensors and backlighting.

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