

# Pioneers in Touchscreen Display Technology for the Cockpit

**Esterline Corporation**, founded in 1967, is a shining example of an organization powered by innovation.

Headquartered in Bellevue, WA, Esterline operates manufacturing facilities in Belgium, Canada, China, Dominican Republic, France, Germany, India, Japan, Mexico, Morocco, Singapore and the United Kingdom.

As a specialized manufacturing company with nearly 13,000 employees serving the aerospace and defense markets, approximately 80 percent of Esterline's total revenues are generated from these markets. The remaining 20 percent is from the application of these technologies in adjacent markets. Esterline management views the company's businesses in three segments related to its set of core competencies: Avionics & Controls, Sensors & Systems and Advanced Materials.

Korry, an Esterline brand, offers an example of how these technological advances are changing the horizon in aerospace. The Korry Utility Control System (UCS) Touchscreen Display Technology is the first touchscreen control solution for overhead panels in civilian and military aviation. It offers a 75 percent reduction in separate display and switching components as well as higher reliability, and is currently flying on Gulfstream G500 and G600 long-range business jets. It not only increases ease of use for the crew, but it also simplifies the long-term management of the pilot interface, with control-panel functions easily changed by updating software rather than hardware.

The concept in developing the UCS display was to integrate many separate displays and switching components into one interactive surface while increasing flexibility and reliability. Its architecture combines hardware and software so aircraft manufacturers can configure one piece of hardware to meet varying individual aircraft requirements and adapt functions to changing



needs over time. This consolidation of functions into one screen, however, did present a number of challenges.

For example, think of using the touchscreen on your smartphone or tablet outside on a sunny day. The display must be bright enough to allow the pilots to view the controls. Too much glare reflecting off the screen or fingerprints on its surface can make the display hard to see. Esterline addressed these challenges by developing a sunlight-readable high-bright, high-contrast display in combination with a new anti-fingerprint coating that repels skin oils.



The human factors involved in entering commands also presented issues. Mistyping on controls for an aircraft can have a greater impact than mistyping a text message. Ensuring an action is correct and intended by the flight crew involves the use of tactile feedback through Esterline developed features. Esterline's implementation requires the operator to select an action by applying the right amount of pressure to the screen with a gloved or bare finger or a stylus. For additional security, a touch-hold-release user interface reduces the chance of inadvertent activation.

#### Features of the Korry UCS touchscreen display technology include:

- **Flexibility:** control-panel functions can be changed by updating software instead of changing hardware.
- **Triple redundancy:** three displays, each with two channels, allow for one channel to be down without interfering with normal aircraft operation.
- **Anti-fingerprint surface:** novel surface technologies allow skin oil to stay on the operator's skin instead of the display surface.
- **High-bright/high-contrast display:** all information is readable in direct sunlight even at wide angles.
- **Reliability:** reduction of separate switches by more than 75 percent minimizes the potential for failure; the glass screen is designed for life-of-the-aircraft durability.
- **Multiple touchscreen display sizes:** ranging from 3ATI to 15.4 inches.
- **Open architecture:** customers can implement their own look and feel for the control interface.
- **Ergonomics:** control activation is secure in varying conditions, including turbulence, and with different types of contact.
- **Design values:** the technology can be packaged in a sleek, low-profile format ideal for new-generation aircraft.

After pioneering its UCS touchscreen display technology for the business jet market, Esterline is now making it available in a format easily adapted to a wider range of aircraft. 