

## HUMAN MACHINE INTERFACE (HMI) PRODUCTS FOR AEROSPACE & DEFENSE



Innovative solutions. Best-in-class reliability.  
Customer-driven service & aftermarket support.

Advances in engineering, technology, manufacturing and connectivity are driving development in Human Machine Interfaces (HMIs) across the Aerospace & Defense industry.

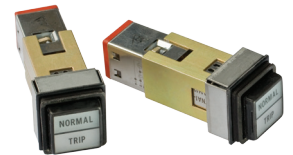
From cockpit design and automation in commercial aircraft and military helicopters, to shipboard engine rooms and sophisticated control systems that launch us into space, the way we interact with machines and technology-driven devices continues to evolve.

Ducommun engineers, program managers and technical teams are highly skilled in Human Machine Interface (HMI) design, manufacturing and aftermarket offerings. We offer a broad portfolio of innovative HMI products for military, space, commercial aviation and shipboard applications. We design and manufacture a wide range of illuminated switches and keyboards, lighted panels and integrated assemblies.

Dedicated to continuous improvement and the principles of Lean and Six Sigma, Ducommun has a committed team of certified personnel to facilitate the training, events and resources needed to implement measurable CI improvements. Ducommun's quality assurance system is certified to FAA, NASA and AS9100 standards.

### High-Reliability HMI Products

- Illuminated Pushbutton Switches
- Annunciators
- Switch Matrices
- Keyboards
- Illuminated Display Panels & Bezels
- Time Delay Modules
- Caution Warning Assemblies
- Integrated Control Panel Assemblies



### Key Markets + End Use

- Military Fighter Jets
- Military Transport Aircraft
- Military Helicopters
- Military Ground Vehicles
- Shipboard Systems
- Space Systems
- Control Systems
- Commercial Aviation



## Human Machine Interface (HMI) Products

As technology and systems evolve in Aerospace & Defense platforms, advancements in engineering and manufacturing capabilities provide opportunities to develop new and enhanced products and components to support them.

### Illuminated Pushbutton Switches, Annunciators & Switch Matrices

A market leader in lighted switch manufacturing, Ducommun offers a wide range of switch components that meet the needs of our most demanding customers. A majority of our HMI products are FAA/PMA certified or MIL-PRF/QPL certified. All of our product series' offer customizable features including:

- Color (bezel, back/foreground and light)
- NVIS Filtering compatible, Type I and Type II
- Custom or standard display etching and font size
- 0-4 pole options
- EMI shielding
- Ground options, common, split
- Gold or silver contacts
- Incandescent or LED (with or without incandescent dimming curve)
- Sealed or unsealed, splash proof, drip proof, moisture seal
- Solder, turret and poke home terminal options
- Sunlight readable, dead front and NVIS compatible options
- Five (5) different pushbutton sizes available
- Distinct tactile feel during switch actuation suitable for use in noisy and ruggedized environments

Any switch or combination of switches can be combined in a custom matrix assembly. In addition, all models can be configured with switching functionality or as annunciators.



Illuminated Pushbutton Switch: 10648 Mark 11

### Light Plates, Bezels, Keyboards & Keypads

Ducommun manufactures incandescent, electroluminescent and light emitting diode (LED) illuminated display panels in all types and classes. Each one is precision engineered and manufactured to exceed customer specifications. Only the best quality materials are used to ensure our products meet the highest performance standards required by the aerospace industry.

- MIL-DTL-7788
- Laser-etched for consistent readability
- NVIS compatible, Type I and Type II
- Light balanced and tested to meet all luminance, chromaticity, uniformity and radiance requirements
- Elastomer keypad

Our light plates are found on commercial and military ships, aircraft, ground vehicles, helicopters and spacecraft.



Integrated Panels

### Configurations

- Type III thru VII
- Machined acrylic, polycarbonate or aerospace grade aluminum
- Incandescent, electroluminescent, or LED (with or without incandescent dimming curve, PWM)
- Complex curved configurations
- Available in any FED-STD 595 color
- Standard, military or custom connectors

# Innovation. Reliability. Service.

## Integrated Control Panels

Ducommun harnesses its expertise in pushbuttons, annunciators, key pads and light plates to develop our custom integrated control panel assemblies. Our panel assemblies incorporate a variety of components and features.

- Custom indicator assemblies or pushbutton switch assemblies
- Rockers 2/4 way switch elements (environmental sealed)
- Annunciators (incandescent and LED dimming utilizing PWM)
- Sunlight readable/dead front NVIS compatible
- LED/fluorescent/electroluminescent
- Digital control of annunciator actuation and panel
- Encoders: optical/mechanical
- Diode and resistor arrays

Our complete lifecycle, engineering and 3D solid modeling capabilities allow us to develop custom control panels to meet the most complex and demanding applications.

Bus Interfaces to panels using discrete, serial and parallel data including RS232 and RS422.

## Integrated Assemblies: Switch Options

- Toggle
- Rotary switch
- Illuminated switches
- SPST, SPDT, DPDT
- Momentary contact
- Standard, military or custom connectors
- Rotary switch: engine start switch

## Aftermarket Offerings

In addition to our original equipment, we also provide aftermarket spares and offer a full range of MRO services for all products that we manufacture, including:

- Aircraft system control panels
- High precision brushless motors and resolvers
- Pushbutton switches
- Lighted panels
- Night vision compatible switches
- Microwave & millimeter wave switches
- Waveguides
- Ruggedized keyboards
- Radio frequency switches

We are an FAA & EASA Licensed Repair Station. Air Agency Certificate Number D5YR708X. AS9100 2016 Certified.



Integrated Assemblies



Rotary Switch: Engine Start Switch

## Engineering & Manufacturing Capabilities

### Engineering

- Electrical and mechanical design capabilities
- Various CAD capabilities
- Dedicated teams for each product line
- Manufacturing, testing, and lighting engineers

### Testing

- Environmental - Thermal - Humidity
- Spectral radiometry - spot and 2D photometry
- High power

### Assembly

- Lean environment
- Dedicated assembly cells

### Mechanical

- Sheet metal stamping and forming
- Injection molding
- Tool making center
- Laser etching
- Material and component traceability
- CNC machining center

### Certifications

- AS9100/ISO 9001 certified
- MIL-PRF-22885 QPL
- MIL-DTL-7788 QPL
- FAA repair station (D5YR708X)
- EASA repair station (EASA.145.5946)
- IPC-A-610/J-STD-001 Class 3 soldering
- J-STD-001 Space addendum soldering

**AS9100**  
CERTIFIED

**ISO9001**  
CERTIFIED



Connect with a Ducommun HMI Products Representative  
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