

# Custom Equipment, Relay Boxes and Assemblies



**LEACH®** INTERNATIONAL

Solutions for Power Switching and Control

PARIS 1 DIV6



As the leading supplier of aerospace electrical switching components for more than 85 years, Leach International draws upon a long history of innovation and engineering expertise. Through the years, the company has used its talents to introduce groundbreaking technologies and develop new product lines.

Now, Leach combines its leading-edge components with unique design and manufacturing abilities to provide the custom assembly options and service flexibility required by military, aerospace, rail and high-end industrial applications worldwide. By transitioning from component supplier” to “equipment provider,” Leach carries its tradition of excellence to a new level of added-value service.

**Leach International Customization Capabilities Include:**

- Primary Power Distribution Assemblies
- Relay Panels
- Wiring Integrated Assemblies
- Central Warning Panels
- Secondary Power Distribution Assemblies
- Weapon Release Boxes
- Pulse Lighting Modules
- Illuminated Panels and Keyboards
- Thrust Reverser Control Units
- Ground Fault Interrupt Units
- Remote Control Circuit Breakers
- Windshield Anti-Ice Controllers

**Services Tailored to Client Requirements**

While Leach’s engineering and manufacturing expertise covers all levels of product development, the company customizes its services to meet the specific needs of each individual client. Following are general service categories:

**• Customize Existing Product**

Leach adapts existing components to fit customers’ exact specifications.



H contactor with a ground-fault interrupt feature added for commercial aircraft (note the small increase in height)



Electrical load control unit for commercial aircraft



DC contactor with Hall Effect sensor for military and aircraft applications

**• Build to Print**

Leach manufactures products using customer-supplied drawings



Relay control box for commercial aircraft

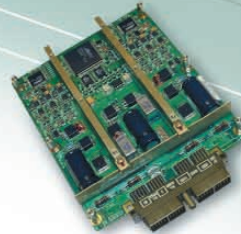
# DESIGN AND Manufacturing Excellence

- **Design to Replace**

Using a customer's existing product as the guide, Leach designs, develops, manufactures and qualifies a replacement product.



AC power distribution assembly for regional jet



Windshield anti-ice controller for helicopter

- **Design to Specification**

Leach designs, manufactures and qualifies new products based on customer specifications.



AC power distribution assembly for rotorcraft

- **Design to Requirement**

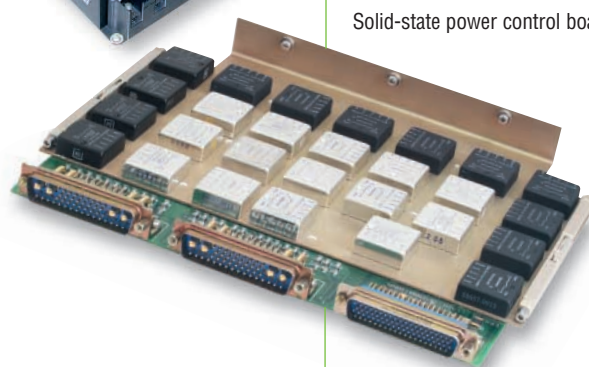
The most extensive of all processes, Leach develops the specifications and designs, manufactures and qualifies a product to customer requirements.



Thrust reverser unit for commercial aircraft



DC power distribution assembly for military transport aircraft



Solid-state power control board for space applications



Leach's extensive design and manufacturing background is complemented by the latest engineering equipment and processes. Using a variety of leading-edge simulation and design software, such as NASTRAN®, MAGNETO®, OrCAD®, AutoDesk Inventor™ and others, the Leach International engineering department designs and develops components and equipment. The company also maintains specially equipped mechanical and electrical laboratories and model/test engineering shops.

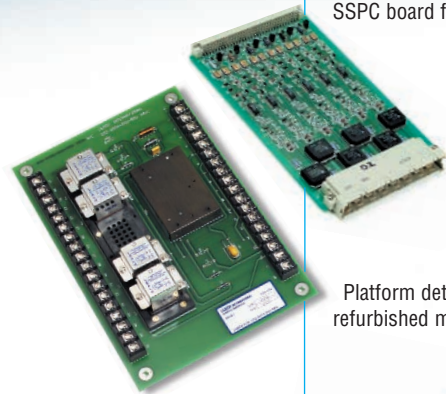
**These extensive resources allow Leach to provide:**

- Custom specifications
- Application-specific screening
- Qualification or application-specific testing
- Extensive environmental and electrical testing

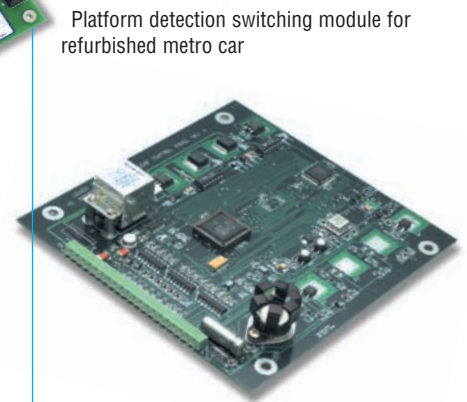
Leach offers its comprehensive services for both electrical and electro-magnetic assemblies and equipment.

• **Electrical Design Capabilities**

- Equipment design
- PCB design
- Component selection
- Switching (solid state and electromechanical)
- Sense and control (CT, Hall Effect, I<sup>2</sup>t tripping)
- Communications (data bus)
- Conditioning (DC/DC application specific)
- Microprocessor integrated control

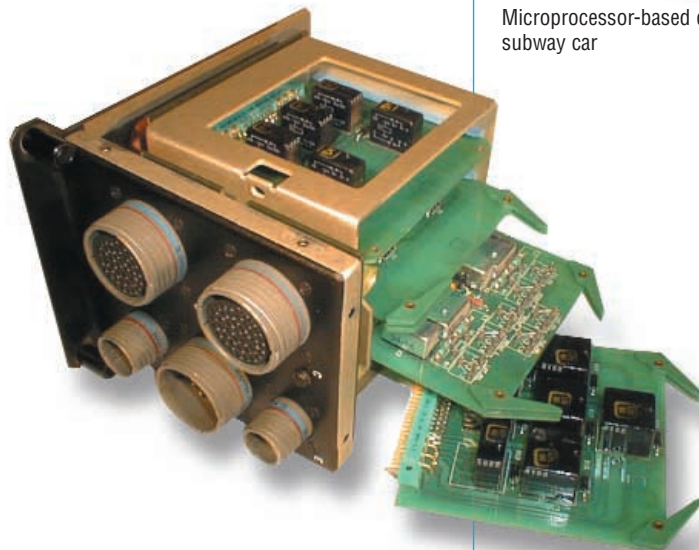


SSPC board for ground transport application



Platform detection switching module for refurbished metro car

Microprocessor-based door controller for subway car



Emergency release box for military aircraft

## • Layout and Electro-mechanical Design Capabilities

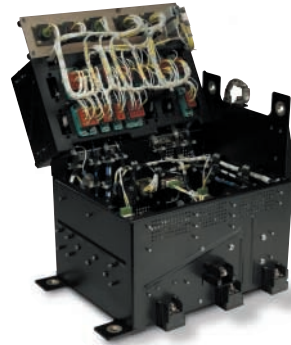
- Equipment assemblies
- PCB Layout
- Hybrid layouts (sizing, location, heat dissipation)
- Hermetic packages
- Magnetic circuits and materials
- Lightweight, rugged designs (to meet military, space and QPL specifications)



Centralized, lighted warning panel for civil aircraft



Wiring integrated assembly box for helicopter



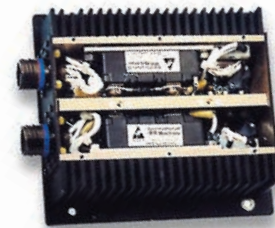
DC power distribution assembly for military attack aircraft



Integrated control keyboard for military fighter



Switching control module for landing lights on commercial aircraft



Illuminated overhead panel for business aircraft

THE LEACH LEGACY:  
COMPONENTS FOR AEROSPACE, MILITARY, GROUND  
TRANSPORT AND HIGH-INDUSTRIAL APPLICATIONS



Leach International's comprehensive product line and extensive experience in developing component products for electrical systems offer a distinct advantage when manufacturing custom equipment, relay panels and assemblies. Most Leach component products feature lightweight, compact, rugged construction, and many are hermetically sealed and qualified to the appropriate military specification. Their use usually provides the customer major design advantages coupled with significant cost savings.

● **Leach Relays and Control Devices**—  
the industry standard

**Half-crystal Can, Subminiature and Balanced Armature Relays**

- Low level to 75 amps
- AC and DC devices
- Coil suppression available

**Time Delay Relays, Sensors and Power Monitors**

- AC and DC devices
- Electromechanical and solid-state designs
- Fixed and programmable
- Timing on operate or release (fixed or adjustable)
- Repeat cycle timers
- Current and voltage sensors
- Over-voltage, under-voltage, phase-rotation and frequency monitors
- Ground power protection monitor
- Ground fault interrupt devices

● **Leach Power Contactors**—  
the leaders in technology

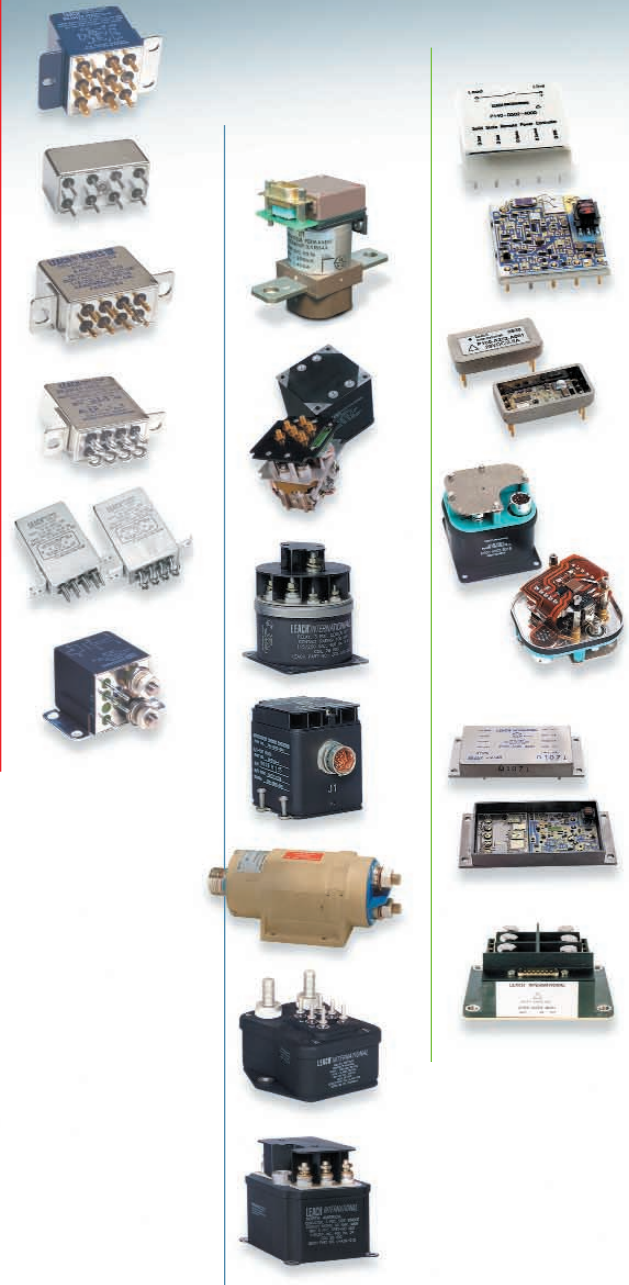
**DC Single-pole and 3-phase Devices**

- 25- to 1000-amp ratings
- Sealed and unsealed versions
- Numerous configurations and power terminations
- Unique interface capabilities
- Includes some Balanced-Force® designs (low-coil power)
- Smart electronics and ground-fault protection available

● **Leach Advanced Solid-state Power Controllers (SSPCs)**—  
the leaders in innovation

**28VDC, 270DC and 115VAC Devices**

- 1- to 225-amp ratings
- Fast acting and trip free
- No derating for load type
- Overload and short-circuit protection
- Fully isolated bias/control and status
- Variety of status outputs



## Company Overview—

A Tradition of Innovation

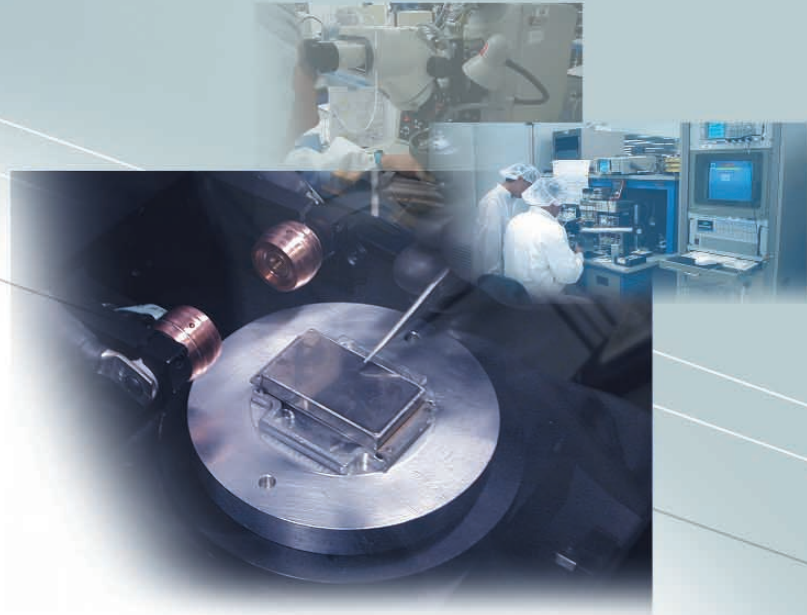
Since introducing the world's first "break-in" relay in 1919, Leach International has continued to lead the industry in innovation and engineering excellence. Additional industry firsts, such as the "Balanced Armature" and "Balanced-Force®" relays, rotary solenoid and power contactors, crystal can relays, time delay relays, and solid-state power controllers, have served to solidify the company's position as the leading supplier of electrical switching and control devices.

With more than 1,000 employees and facilities located throughout North America, Europe and Asia, Leach International is well positioned to continue its leadership role as it expands its product offering and scope of services.

## The Leach difference

If longevity and market penetration are what set a company apart from the competition, then Leach International is indeed in a class by itself. For more than 85 years, the company has been a high quality, high reliability supplier to the military and commercial aerospace industries. In fact, nearly 90 percent of all commercial jets, as well as the vast majority of all military jets, helicopters and other aircraft, use Leach components and assemblies.

Now, with its expansion into custom equipment, relay boxes and assemblies, Leach has furthered its unique position in the aerospace industry. The company has grown from a leading supplier of commodity relays, time delay products (Tier 5) and specification components (Tier 4) to a significant player in the equipment business (Tier 3). This expansion of market position not only makes Leach one of the only companies to supply three distinct tiers of the aircraft market, but it also validates the company's hard-earned leadership position.



**A partial list of Leach International's custom-product customers includes:**

- Agusta SpA
- Airbus SAS
- Alcatel Space
- Alenia
- Alstom
- Astrium
- BAE Systems PLC
- Bell Helicopter Textron
- Boeing Company
- Bombardier, Inc.
- Dassault Aviation
- Dornier Luftfahrt GmbH
- Eurocopter SA
- European Aeronautic Defence & Space Company
- Fokker Elmo B.V.
- General Dynamics Corporation
- Honeywell
- Ilyushin Aviation Complex
- Korean Aerospace Industries Ltd.
- Lockheed Martin Corporation
- NASA
- Nordam
- Northrop Grumman
- Pilatus Aircraft Ltd.
- Raytheon Company
- Rockwell International Corporation
- Saab
- Smiths Aerospace
- Thales
- Westland Helicopters Ltd.

# Leach Capabilities

## ELECTRICAL DESIGN

Analog and Digital Design (FPGA, ASIC)  
Microprocessor Design  
Software Design  
Solid-state Switching  
Sense & Control (CT, Hall Effect, I2t Tripping)  
EMI  
Reliability Prediction (FMEA, FMECA, Fault Tree)  
Automated Test Equipment Design  
(Hardware & Software)

## MECHANICAL DESIGN

Relay Design  
Contactor Design  
Tooling & Fixture Design  
Magnetic Design  
Finite Element Analysis  
(Structural & Thermal Analysis)  
Housing/Chassis Design

## PACKAGING DESIGN

Printed Circuit Board Layout  
Hybrid (Thick Film/Chip & Wire) Layout  
Smart Contactors  
Electrical Panels  
Relay Panels  
Power Distribution Assemblies  
(Primary & Secondary)  
Harness Design  
Material & Processes

## QUALIFICATIONS AND CERTIFICATIONS

### Military/Space Qualifications

- MIL-PRF-39016
- MIL-PRF-6106
- MIL-PRF-83536
- MIL-PRF-83726
- CECC16101
- CECC16303
- SCC3601
- SCC3602

### Quality Systems Certifications

- ASA9100
- ISO 9001
- MIL-STD-790

# LEACH<sup>®</sup> INTERNATIONAL

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