


C&K

Littelfuse[®]

A composite image showing a satellite in orbit in the upper left and a commercial airplane flying through a layer of white clouds in the lower right. The background is a clear blue sky.

**Aviation, Defense,
and Space**
Application Guide

C&K Aerospace is Now
a Part of Littelfuse



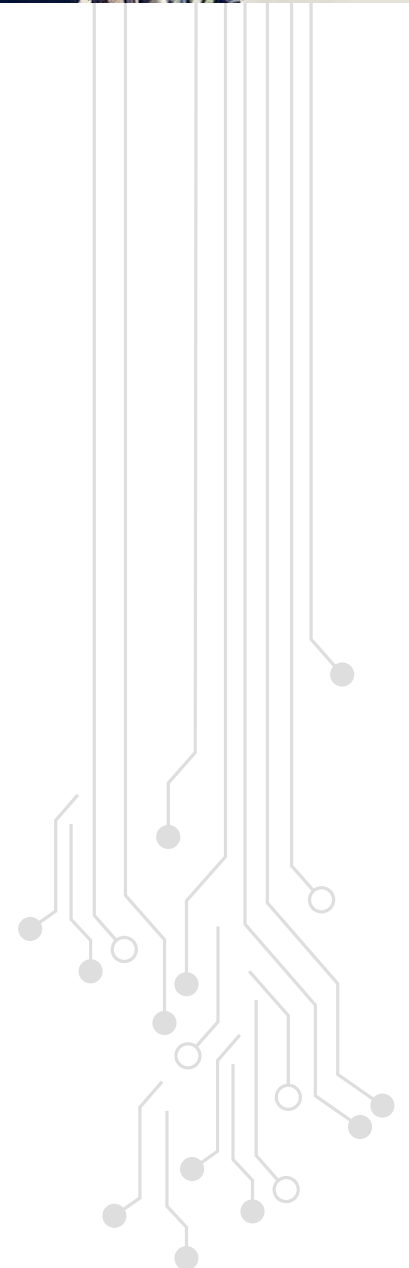
C&K High Reliability Products

About this guide

This guide provides an overview of the Littelfuse technologies used in various aviation, defense, and space applications. It is designed to help you quickly find design solutions appropriate to your application.

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Specifications, descriptions, and illustrative material in this literature are as accurate as known at the time of publication, but are subject to changes without notice. Visit [Littelfuse.com](https://www.littelfuse.com) for more information.





Littelfuse: Everywhere, Every Day

Founded in 1927, Littelfuse has become the world's most respected circuit protection brand, with well-established and growing platforms in power control and sensing technologies. Today, we are a global company, offering a diverse and extensive product portfolio—fuses, semiconductors, polymers, switches, ceramics, relays, sensors, and more—serving the electronics, transportation, and industrial markets. Each is manufactured to exacting quality standards and backed by an unwavering commitment to technical support and customer service.

Our history of innovation, combined with our customer-first culture, drives us to collaborate with you to develop safer, more reliable products that are energy efficient and compliant with global regulations. We will partner with you to solve complex problems wherever electrical energy is used, bringing design, engineering, and technical expertise to deliver business results.

Littelfuse, Inc. acquired C&K on July 19, 2022. C&K is one of the most recognizable and trusted names in the electromechanical switch industry. Adding C&K's outstanding engineering expertise and high-performance products will allow us to offer you a broader product portfolio, expanded footprint, and enhanced distribution channels.

Why Choose Us

Complementing our wide portfolio of circuit protection products is a global network of design and technical support expertise. We offer decades of design experience to help you address application challenges and achieve regulatory compliance.

Your Single Source

The extensive portfolio of high-quality, high-performance and reliable aviation-specific switches and space-specific connectors are specifically made to withstand the harsh aerospace environments.

Testing Support

Littelfuse can help ensure that your products will withstand most common threats repeatedly and will fail safely under extreme circumstances. We can serve as an independent source to provide assistance as you design by offering lab testing capabilities. With more than 15 lab locations world wide, Littelfuse labs are equipped to provide testing that includes, overcurrent, overvoltage, ESD, temperature, failure analysis, material analysis, and application performance.

Application Knowledge

With over 90 years of experience, C&K has a deep understanding of the aerospace market. Engineers and circuit designers around the world have come to rely on Littelfuse products and application knowledge to support their designs.

Global Support

Littelfuse stays close to customers. With manufacturing, lab, and design facilities located around the globe, application knowledge and technical support are locally available. Also, we offer a network of regional customer support offices and hundreds of independent authorized distributor contacts to assist you. Visit [Littelfuse.com/contact-us](https://www.littelfuse.com/contact-us) to find local support near you.

Standards Compliance Expertise

Most Littelfuse products comply with a wide range of applicable industry and government guidelines as well as our own rigorous quality and reliability criteria. We continually look forward and adapt to changing requirements so that our products will comply with industry-specific national and international standards and regulations.

Most of the products in this guide are ESA/ESCC and MIL qualified and available for a range of applications, including satellites/launchers, PCB connectors, cabling, computer space systems, antenna connections, harnesses, and many more.

Operational Excellence

With our global manufacturing footprint, Littelfuse is firmly committed to manufacturing quality products at a competitive price. We build quality into our products and services, striving for zero defects in everything we do, thereby reducing cost and increasing your total satisfaction. We strive to exceed your expectations every day.

C&K's AS9100 certification enables us to receive orders directly from all over the globe. Product designers can either choose to take advantage of C&K's available portfolio of highly reliable connectors or benefit from our unmatched custom design capabilities, coordinated and optimized by our integrated engineering, laboratory and manufacturing teams. Alternatively, customers can work alongside a preferred distribution partner to complete their aviation, defense and space designs.

Quality Assurance

Our global manufacturing facilities abide by strict quality assurance requirements and hold the following quality management system registrations:


- ISO 9001
- ISO 14001
- IATF 16949

Applications

Certified by space agencies since 1981. More than 3,000 cumulative years in space. We are present in more than 700 satellites, inside all the domain of application: Earth Observation, Government/Civil Communications, Security, Exploration, Navigation, Science Satellites, Launchers and Missions.

C&K Offers a Range of Products for Several Applications


- Satellites/Launchers
- Space computer systems
- Payloads- board to board connection
- Integrated interconnected systems
- Antenna connections and harnesses
- Test equipment applications
- Cabin, lighting, and lavatory interconnection systems
- Flight control unit



Ariane 5
Launcher

- **Launch Year:** 1997
- **Orbit:** Various
- **Launch Location:** French Guiana
- **Launch Vehicle:** Ariane 5
- **Years of Service:** Ongoing

Photo: ESA



MTG
Meteorolite Third Generation

- **Launch Year:** End of 2022
- **Orbit:** Geo Orbit (36,000 km)
- **Launch Location:** French Guiana
- **Launch Vehicle:** Ariane 5
- **Years of Service:** Approx. 20

Photo: ESA



Galileo
European Global Satellite Navigation System

- **Launch Year:** 2011
- **Orbit:** Meo Orbit (23,000 km)
- **Launch Vehicle:** Ariane 5/Soyuz
- **Years of Service:** 10

Photo: ESA



O3b
Telecommunication Satellite Constellation

- **Launch Year:** 2013
- **Orbit:** 8063 km
- **Launch Location:** French Guiana
- **Launch Vehicle:** Soyuz-2/Fregat-MT
- **Years of Service:** 6



Iridium
Satellite Constellation

- **Launch Year:** 2017
- **Orbit:** Approx. 781 km
- **Launch Vehicle:** Delta II 7920-10C, Proton-K/17S40, Chang Zheng 2C-III/SD
- **Years of Service:** 2



Gaia
Space Observatory

- **Launch Year:** 2013
- **Orbit:** Lissajous Orbit (707,000 km)
- **Launch Location:** French Guiana
- **Launch Vehicle:** Soyuz-2/Fregat-MT
- **Years of Service:** Approx. 12

Photo: ESA

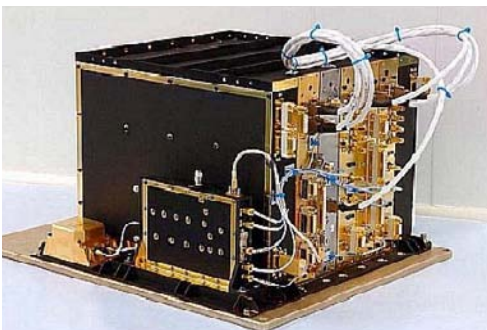
Certifications

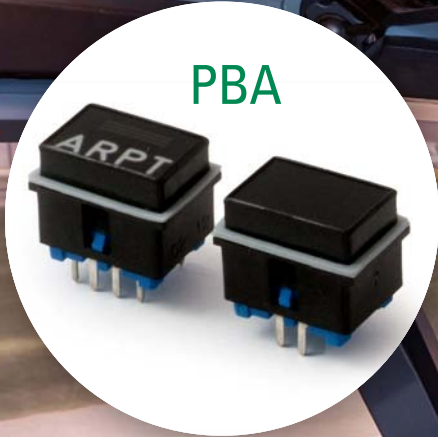
General Certifications

- ISO 9001
- ISO 14001
- ISO 50001

Aviation, Defense, and Space Certifications

- ESA: ESCC 3401
- CNES: ASF13-103 (EWIS)
- DLA: MIL M24308
- NASA: GSFC 311P
- AS 9100





PBA



Cable Harness

- Over 10,000 aircraft equipped with EIS/C&K Aerospace harnesses
- 15,000 km of harnesses delivered to customers

Push Button Series



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PBA

Illuminated Push Button Switch. Offers a solution for aviation applications. Flexible LED colors and indicator cap display.

Features

- Illuminated display
- Lightweight, short length
- Tactile feedback
- One or two indicator lines
- 3 sizes: 9.5 x 14 mm; 11.5 x 14 mm and 14 x 14 mm

Micro-D Connectors Series



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MDMB

Unique product. This Micro-D connector series is designed with removable crimp contact. Useful for harnesses manufacturers. This gives them great flexibility in the realization of electric wiring interconnect system.

Features

- Unique design
- Removable crimp contact technology
- All sizes available from 9 to 51 contacts
- Nickel and gold finish
- Associated contacts available

Aero Splice Series



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1 way

Unique product design patented. One way connector linking 2 wires with removable contacts. Replace hand splice process by a standardized solution with D*MA contact technology.

Features

- Unique design
- Wires to wires connect solution
- Cost saving by replacement of manual splices by standard solution
- One way connector with removable contacts
- Use standard D*MA contacts

Aero Splice Series (continued)



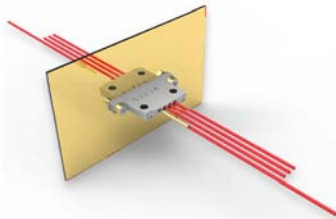
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4 ways Radial Fixing

4 ways connector linking 2 wires with removable contacts. Replace hand splice process by a standardized solution with D*MA contact technology. Compact format and designed to accept the most popular gauges (AWG20 to AWG30).

Features

- Unique design
- Wires to wires connect solution
- 4 ways connectors with removable D*MA contacts
- Stackable
- Floating or possibility of fixing the insulator



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4 ways Axial Fixing

4 ways connector linking 2 wires with removable contacts. Replace hand splice process by a standardized solution with D*MA contact technology. Compact format and designed to accept the most popular gauges (AWG20 to AWG30).

Features

- Unique design
- Wires to wires connect solution
- 4 ways connectors with removable D*MA contacts
- Use to pass through panels





We design, manufacture, integrate, and repair wire harness systems for our defense customers. The brand name E.I.S. Electronics stands for flexibility, expertise, quality, and competitiveness. Lean organization and fast decision making processes are our advantages.



Our **Electrical Wiring Interconnection System** meets the ruggedization and high reliability requirement of various defense applications.



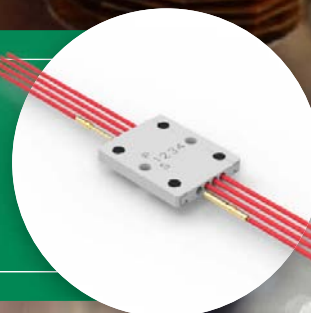


MDMA Series

Space is a challenging environment for electronic systems and components.

Ultra-high reliability is the top priority. This is why space agencies around the world use connectors from C&K for demanding applications in satellites, launchers, telescopes, and other spacecraft.

The MDMA Series Micro-D Connectors have a unique design with removable crimp contact gives great flexibility in the realization of electric wiring interconnect system.



Space Splice Connector

Highly reliable yet compact and easy to use alternative for manual splicing. Space splice replaces manual splices by standard solution and uses the standard D*MA contacts.

D-Sub Connectors Series



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D*M

This is the largest standard used in rectangular connectors. Mainly located on the equipment for signal data transfer. The robustness of the design and its maturity make it the reference in this field of application.

Features

- All standard, high density sizes
- Terminations: solder cup, straight, 90° bent (US and EU footprint)
- Brackets and fixing options



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D*MA

D-Sub connector designed with removable crimp contact. Useful for harnesses manufacturers. This gives them great flexibility in the realization of electric wiring interconnect system.

Features

- All standard, high density sizes
- With or without contacts
- Standard, large and reduce crimp contacts sizes
- Fixing options



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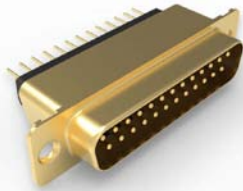
COMBO

It allows to integrate in the standard shape of the D-Sub family, power, and RF signals. A wide range of combinations are available with removable AWG8 contacts.

Features

- D-Sub connector with combination of signal, power and coax contacts
- Terminations: solder cup, straight, 90° bent, crimp

D-Sub Connectors Series



D*J

D-Sub connector with ceramic capacitor. Allows signals to be filtered with a technology suitable for spatial use.



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Features

- Filter connectors under CSFR165 specification (according to ESCC 3405)
- Medium frequency, capacitance at 1k Hz: 4000 to 12000 pF
- Attenuation at 100 MHz: 50db min



Savers

Connector Savers is the solution for preventing contact damage. It protects connectors that are mated and unmated frequently during all the phases of tests and programs.



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Features

- All sizes for standard, high density, and combo connectors
- With or without contacts



Accessories

The use of the connectors must be done with accessories which allow the guarantee of good assembly, a secure fixing, and a protection of the terminations. We offer a large range of accessories for safe use of our connectors.



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Features

- Jackpost and Jackscrew for connectors and Savers
- Lightweight backshells: nickel and gold finish, several outlet: straight, 45°, 90°, cylindrical, elliptical
- Dust caps
- Tools: extraction tools, crimp tools, locators, retention tools...

Micro-D Connectors Series



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MDM

Solution for application in which small and high density of contacts are required (Pitch: half of the size of D-Sub connector). Micro-D connectors are manufactured with lightweight aluminum shell.

Features

- All sizes available from 9 to 51 contacts
- Terminations: solder cup, straight, narrow profil, 90° PCB bent, wired
- Brackets and fixing options
- Nickel and gold finish



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MDMA

Unique product. This Micro-D connector series is designed with removable crimp contact. Useful for harnesses manufacturers. This gives them great flexibility in the realization of electric wiring interconnect system.

Features

- Unique design
- Removable crimp contact technology
- All sizes available from 9 to 51 contacts
- Nickel and gold finish
- Associated contacts available



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Savers

Connector Savers is the solution for preventing contact damage. It protects connectors that are mated and unmated frequently during all the phases of tests and programs.

Features

- All sizes available from 9 to 51 contacts
- Fixed contacts
- Nickel finish only

Micro-D Connectors Series (continued)



Accessories

The use of the connectors must be done with accessories which allow the guarantee of good assembly, a secure fixing, and a protection of the terminations. We offer a large range of accessories for safe use of our connectors.

Features

- Jackpost and Jackscrew for connectors and Savers
- Lightweight backshells: nickel and gold finish
- Several outlet: straight, 45°, cylindrical, elliptical
- Dust caps
- Tools: extraction tools, crimp tools, locators, retention tools...



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MTB Connectors Series



MTB1

In line contacts connector without protective shell. Micro-D contact technology. Useful on computer testing process.

Features

- From 2 to 51 contacts in line
- Terminations: solder cup, straight, 90° PCB bent, wired
- Polarization, latching, and guide post options.



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Space Splice Series



1 way

Unique product design patented. One way connector linking 2 wires with removable contacts. Replace hand splice process by a standardized solution with D*MA contact technology.

Features

- Unique design
- Wires to wires connect solution
- Cost saving by replacement of manual splices by standard solution
- One way connector with removable contacts
- Use standard D*MA contacts



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Space Splice Series (continued)



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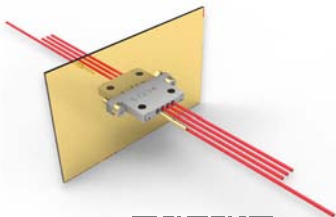


4 ways Radial Fixing

4 ways connector linking 2 wires with removable contacts. Replace hand splice process by a standardized solution with D*MA contact technology. Compact format and designed to accept the most popular gauges (AWG20 to AWG30).

Features

- Unique design
- Wires to wires connect solution
- Cost saving by replacement of manual splices by standard solution
- One way connector with removable contacts
- Use standard D*MA contacts



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4 ways Axial Fixing

4 ways connector linking 2 wires with removable contacts. Replace hand splice process by a standardized solution with D*MA contact technology. Compact format and designed to accept the most popular gauges (AWG20 to AWG30).

Features

- Unique design
- Wires to wires connect solution
- 4 ways connectors with removable D*MA contacts
- Use to pass through panels



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Interposer

Board to board connection with custom solderless solution. Designed to ensure reliability and performance with flexibility to incorporate specific application features. Stable contact resistance: the electrical contact function is decoupled from the pressure applied by spring.

Features

- Custom solderless solution
- Spring probe contact technology
- No soldering process
- Easy build interposer technology

Custom Design

C&K expertise and capabilities allow the design and manufacture of custom products and solutions that match the specific requirements of our customers. C&K custom products and solutions can cover the terminations, cable harnesses, rear potting, hardware, and backshells.

About C&K®

On July 19, 2022 Littelfuse, Inc. acquired C&K. C&K has been providing innovative customer solutions for over 90 years. With its worldwide manufacturing, engineering and sales support, C&K is focused on delivering customer satisfaction with superior products, processes, and services. Through close partnerships with our customers, C&K continues to expand its offering to fully integrate our core switch products into customer specific interface solutions.

Satellite, launchers, and any other systems for space applications require high reliability products as operating conditions can be extreme. C&K offers a large range of ESA and MIL qualified products to cope with vibration, radiation, outgassing magnetism and corrosion issues, and provides high quality and reliability solutions demanded in harsh environment conditions. C&K offers custom design capabilities coordinated and optimized by its integrated Engineering, Laboratory, and Manufacturing teams.

Supporting customers:

With our **Standard** products.

By **Customizing** existing products.

By **Co-developing** new products.



Additional Resources



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High Reliability TVS Diodes Technology Brief

This brief provides an overview of Hi-Reliability TVS Diodes that are suitable for applications requiring higher reliability performance under harsh conditions.



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Circuit Protection Products Selection Guide

This guide provides a summary of key circuit protection consideration factors, descriptions of the technologies Littelfuse offers, and product selection tables. It is designed to help you quickly find a protection solution appropriate to your application.



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Sensing Products Selection Guide

This guide provides an overview of magnetic and temperature sensing technologies, key consideration factors, descriptions of technologies Littelfuse offers, and product selection tables to help you quickly find the sensing solution appropriate for your application.



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Power Semiconductor Catalog

This catalog represents the powerful combination of IXYS: A Littelfuse Technology. It offers a comprehensive portfolio of advanced power semiconductor technologies, including silicon and wide bandgap solutions in discrete and module packages.

An Extension of Your Team

Our engineers are available to help identify potential issues and provide product recommendations to solve problems.

For aviation, defense, or space support, email:

aerospacesupport@littelfuse.com

Application and Field Support

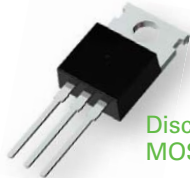
Our experienced product and application engineers work step by step with customers from design to installation to determine the best solution. Contact us today:

[Littelfuse.com/contactus.aspx](https://www.littelfuse.com/contactus.aspx)

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PPTCs



Discrete MOSFETs



SCR Thyristors



Reed Switches



TVS Diodes



Discrete IGBTs



Protection Relays



TRIACs



IGBT Modules

LOCAL RESOURCES FOR A GLOBAL MARKET



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