

MISSION-CRITICAL
INTERCONNECT
SOLUTIONS



Glenair
SIGNATURE SERIES

Space-Grade Interconnect Solutions

For Launch Vehicle and Satellite Applications

MARCH 2024





**SIGNATURE MIL-STAR
HOOKUP WIRE AND CABLE**



Space-Grade Solutions

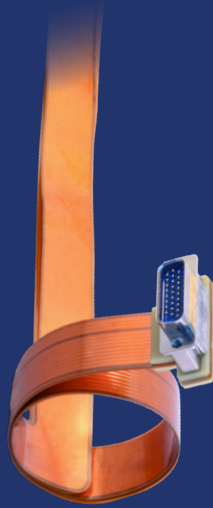


**NASA · ESA · JAXA · CSA · Commercial
Launch Vehicles · Satellites · Landers and Rovers**

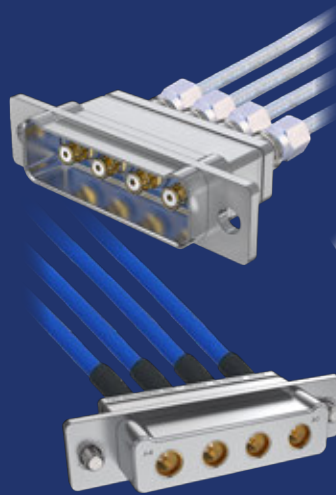
TURNKEY INTERCONNECT ASSEMBLIES



Shielded Wire Harnesses
and Complex Cables



Flex and Rigid Flex Circuit
Assemblies



High-Frequency RF / Microwave
Assemblies



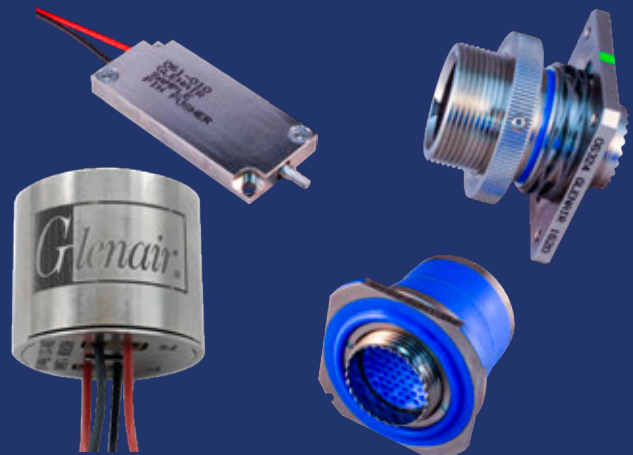
High Speed Datalink
Interconnect Assemblies

FIBER OPTIC INTERCONNECTS



Military-grade PC termini type plus ultra high-density MT Elite®
and PRIZM® MT solutions

HDRMS AND OTHER SPACE MECHANISMS



US- and EU-made Hold-Down
and Release Mechanisms

Assisted Separation Force
Blind-Mate Connectors

SPACE-GRADE CYLINDRICAL CONNECTORS



SuperNine® "Better Than QPL"
MIL-DTL-38999 Series III

Planar Array EMI / RFI
Filter Connectors

Glass and Encapsulant
Hermetic Seal Connectors

Sav-Con® Connector Saver
Go-Betweens

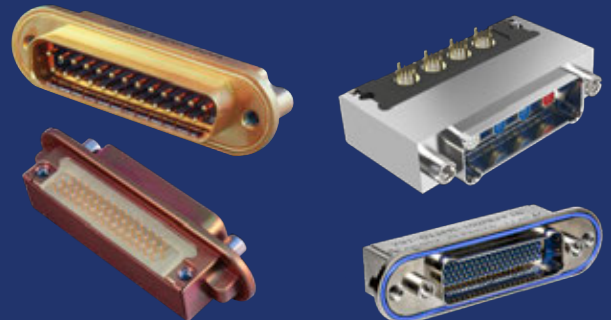
MICRO MINIATURE CIRCULAR CONNECTORS



Series 806 Mil-Aero
Micro Miniature D38999

Series 80 Mighty Mouse
High-Density

SIGNATURE RECTANGULAR CONNECTORS



HiPer-D® High-Performance
M24308

Series 79 Micro-Crimp
Hi-Rel Signal, RF, High-Speed

MICRO AND NANO MINIATURE RECTANGULAR CONNECTORS



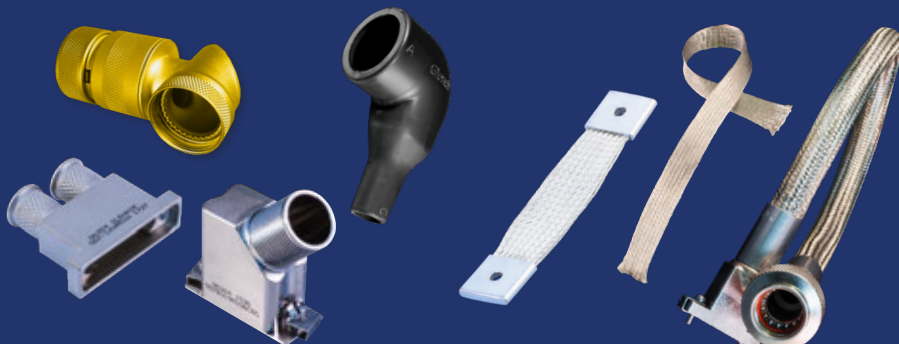
HD Stacker™ High-Density
Board-to-Board

MIL-DTL-83513 Micro-D
Connectors and Assemblies

Latching MicroStrips™
Lightweight, High-Density

QPL and Glenair Signature
Nano Connectors

BACKSHELLS AND ACCESSORIES LIGHTWEIGHT SHIELDING



EMI Shield Termination Backshells for
Satellite Wire Harnesses

EMI/RFI Braided Wire Shielding
and Ground Straps

REFERENCE APPLICATIONS AND FACTORY TOURS





Glenair Signature Interconnects for Launch Vehicle Applications

MISSION-CRITICAL TECHNOLOGY

Connectors, cables, and wiring play crucial roles in the functionality of the satellite launch vehicle in communication systems, power distribution, data transmission, guidance and control.

Electrical Power Distribution

Power interconnects distribute electrical power from the primary power source (e.g. batteries, fuel cells) to various subsystems, components, and payloads on board the launch vehicle, including propulsion systems, avionics sensors, communication equipment, and other electrical devices throughout the rocket.



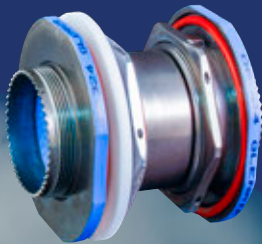
High-voltage power bulkhead feed-thrus



HiPer-D combs with hybrid signal and power



PowerPlay™ high-power in MIL-DTL-38999 Series III packaging



Blind-mate, Assisted Separation Force power interconnects



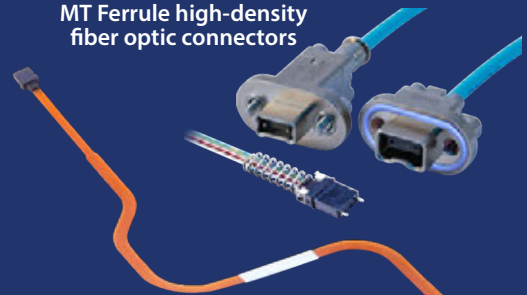
TurboFlex™ ultra-flexible power distribution cable



High-Speed Optical / Electrical Data Links

High-speed interconnects are used to transmit data in applications where low latency and high bandwidth are critical—such as between on-board computers, sensors, and data processing units.

MT Ferrule high-density fiber optic connectors



Lightweight, small form-factor Optical Flex jumpers



Mighty Mouse micro miniature fiber optic interconnects



VITA 66.1 and 66.4 optical backplane connectors



El Ochito high-speed octaxial for 10GbE



VersaLink 28 Gb/s differential twinax



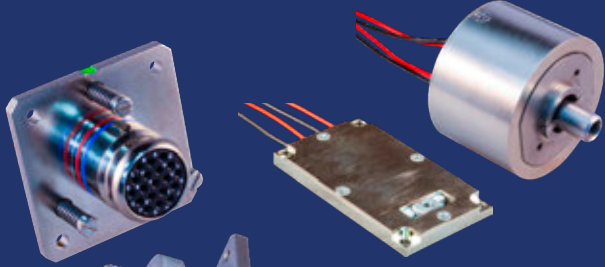
GMMD modular high-speed Micro-D RF / 10GbE connector



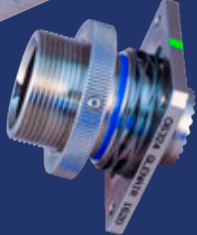
High-Speed Data Link Cables

Space Mechanisms

Hold-Down and Release Mechanisms, and other electromechanical devices used in launch vehicle satellite payloads, are critical in the safe and reliable fulfillment of every mission.



US- and EU-made HDRMs for satellite release and solar panel deployment



Blind-mate assisted release force interconnects



AS81703 type lanyard-release connectors



Lightweight ESD bonds and high-conductivity ground straps

Low-Speed Analog Interconnects

Electrical signal interconnects transmit analog and low-speed databus control signals, telemetry data, and other command and communications between spacecraft systems.

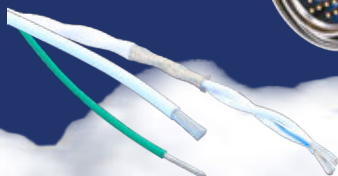


Glass and Encapsulant Hermetic Seal Connectors



Planar Array EMI / RFI Filter Connectors

Series 806 Mil-Aero Micro Miniature D38999



RF (Radio Frequency) Interconnects

RF interconnects are used for wireless communication, telemetry, tracking, and command operations between the launch vehicle and mission control to monitor launch trajectory, rocket status, and health.

RF I/O-to-board ganged cable assemblies with Glenair Signature connectors, contacts, and cable



Size #8, #12, and #16 coaxial and concentric twinax contacts for multi-pin aerospace-grade connectors

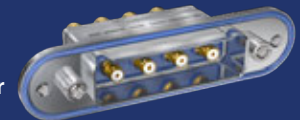
G-Link^{RF}



26.5 GHz G-Link RF contacts with integral female SMA adapter for easy cable attachment



Series 806 RF multipin circular



Series 795RF multipin rectangular

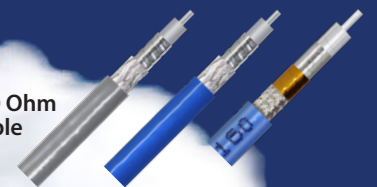


50 Ohm coax jumper assemblies with low-loss cable and precision-grade connectors



RF Connector adapters and protective covers, precision-grade

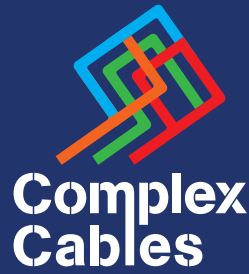
Low-loss 50 Ohm coax cable



MIL★STAR
HIGH-PERFORMANCE HOOKUP WIRE AND CABLE

BLUMARK RF
COAX CABLES

SPACE - GRADE
WIRE HARNESS
CABLE
ASSEMBLIES



Space-Grade Wire Harnesses
and Complex Multibranch
Cable Assemblies

MIL-STAR
HIGH-PERFORMANCE HOOKUP WIRE AND CABLE



Commander Ed White on the first American spacewalk, 1965 with Glenair-manufactured "Golden Umbilical" cable

Glenair's Complex Cable Group is laser-focused on producing turnkey assemblies built principally from Glenair Signature interconnect components including small form-factor connectors, lightweight EMI/RFI shielding, and Glenair MIL-STAR™ wire and cable.



PROVEN PERFORMANCE IN SPACE

- The "Golden Umbilical" life-support cable
- JPL Mars probes (orbiters, landers, and the Curiosity rover)
- AIRS satellite
- Gravity Probe mission
- Space Shuttle
- Titan II launch vehicles
- ESA-certified engineering and production staff (Glenair Space Systems, Salem)
- Current-day Low Earth Orbit satellite networks

TURNKEY

Space-Grade Wire Harnesses

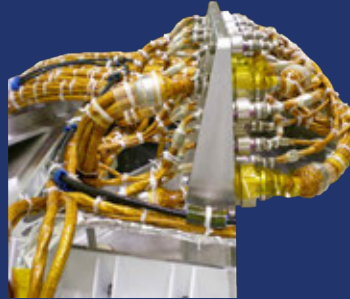


A Technical Readiness Level 9 Glenair Capability Assemblies Built with Glenair Signature Wire and Interconnects

COMPLEX MULTIBRANCH CABLE ASSEMBLIES WITH GLENAIR SIGNATURE WIRE AND INTERCONNECTS



Multibranch wire harness with Glenair Micro-D connectors



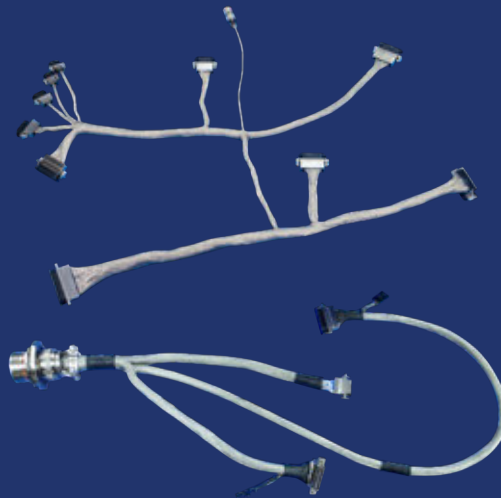
Complex Mighty Mouse cable harness for a Mars rover application



Splice-free Micro-D and Nano cable assemblies



Lightweight microfilament ArmorLite™ EMI/RFI shielded assemblies with Glenair Signature SuperNine, Micro-D, and Nano connectors



Mylar tape-wrapped assembly with Glenair Micro-D connectors



SPACE-GRADE HARNESS FABRICATION AND CLEAN-ROOM INTEGRATION (SALEM, GERMANY)

Glenair's space systems business unit in Salem, Germany specializes in the fabrication of complex space-grade harness assemblies built from Glenair Signature interconnect components including Micro-D, Mighty Mouse, and other small form-factor interconnects.



Hand assembly work performed by ESA-certified assembly staff

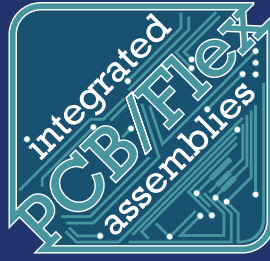


Harness integration into space payload electromechanical devices



EMI shielded and open-wire bundle assemblies ready for flight

SPACE-GRADE
TURNKEY FLEX
CIRCUIT
INTERCONNECT
ASSEMBLIES



Flex, Rigid Flex, and Rigid PCB assemblies with signature interconnect technology for flight-grade applications

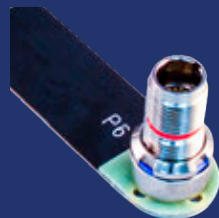


Turnkey connectorized flex, rigid flex, and rigid PCB assemblies incorporating Glenair's broad range of innovative small form-factor circular and rectangular PC-tail connector solutions for optimized ease-of-assembly and SWaP

GLENAIR SIGNATURE PC-TAIL CONNECTOR TYPES AVAILABLE IN TURNKEY FLEX ASSEMBLIES



Series MWD Micro-D and spring-contact AlphaLink



Series 88 SuperFly Nano Miniature



Series 79 Micro-Crimp



SuperNine MIL-DTL-38999 type flexi with board connector

TURNKEY

Flex, Rigid Flex, and Rigid PCB Assemblies with Glenair Signature PC tail connectors for reliable, repeatable performance



MULTIBRANCH FLEX / PCB ASSEMBLIES WITH GLENAIR SIGNATURE CONNECTORS

Space-grade Micro-D flex assembly with NASA EEE-INST-002 screening



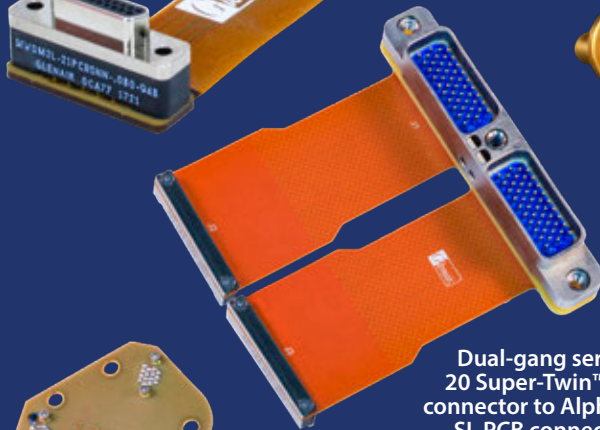
High-shock matched-impedance Mighty Mouse assembly with flex circuit



Space-grade Series 28 HiPer-D to Series 80 Mighty Mouse I/O jumper: a tight space-constrained rectangular-to-circular solution



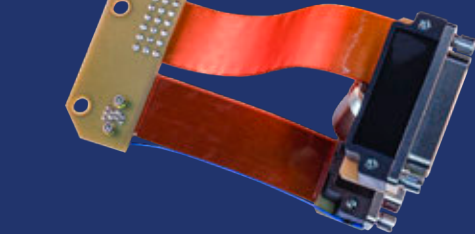
Dual-gang series 20 Super-Twin™ I/O connector to AlphaLink SL PCB connector



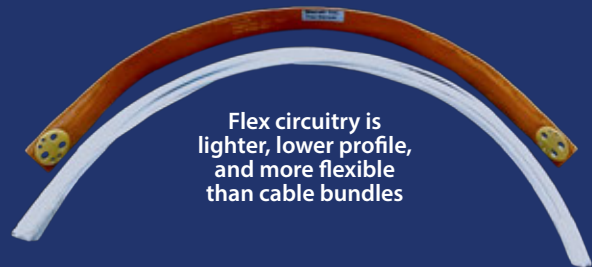
Hybrid flex/rigid flex multibranch Micro-D and Series 23 SuperNine flex assembly with discrete RF circuits



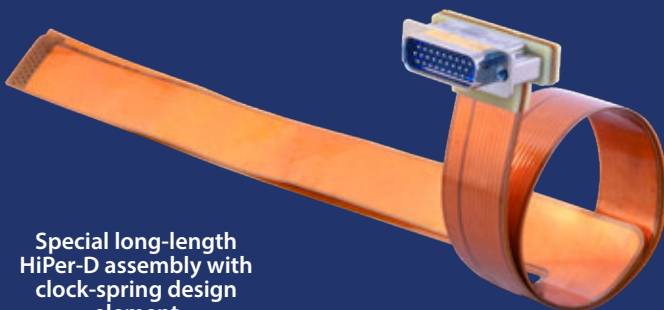
Stacked Micro-D I/O connectors with flex jumper to rigid PCB assembly



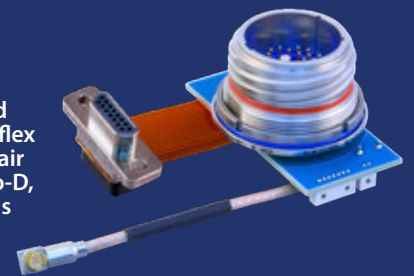
Flex circuitry is lighter, lower profile, and more flexible than cable bundles



Special long-length HiPer-D assembly with clock-spring design element



High vibration and shock resistant rigid flex assembly with Glenair Mighty Mouse, Micro-D, and RF connections



TOTAL VERTICAL
INTEGRATION
FROM CONTACTS
TO CABLES TO
CONNECTORS



Flight-Grade RF, Microwave,
and mmWave Connector
Assemblies and Discrete
RF Contacts and Connectors



RF I/O-to-board
ganged cable
assemblies with
Glenair Signature
connectors, contacts,
and cable



VITA 67.3 RF ASSEMBLIES



Fully-customizable
SMPM and SMPS
connectors,
contacts, and
accessories

GLENAIR SIGNATURE MULTI-PIN I/O CONNECTORS FOR GANGED RF / MICROWAVE APPLICATIONS



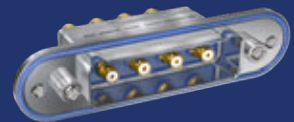
Series 23 SuperNine
"better-than-QPL"
MIL-DTL-38999 Series III
type connector



Series 80 Mighty Mouse
reduced size and weight
aerospace-grade
connector



Series 806 Mil-Aero
micro miniature circular
with performance
IAW D38999



Series 795 RF
precision-machined
aerospace-grade
coax connector

FLIGHT-GRADE

RF and Microwave Turnkey Cable Assemblies



with Glenair Signature Connectors,
Contacts, and BluMarkRF Coax Cables

50 AND 75 OHM COAX CONTACTS FOR USE IN MULTIPIN AEROSPACE-GRADE CONNECTORS



Size #16 coaxial contacts



Size #12 coaxial contacts



Size #8 coaxial and concentric twinax contacts

G-Link^{RF}



26.5 GHz G-Link RF contacts with integral female SMA adapter for easy cable attachment

BLUMARK^{RF} COAX CABLES 50 OHM LOW-LOSS COAX CABLES



Size 047
26.5 GHz
hand-formable
tin-soaked braid



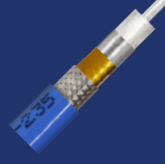
Size 086
40 GHz
FEP jacket



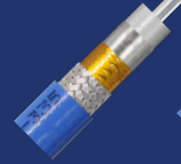
Size 160
18 and 40 GHz,
with FEP or
ETFE jacket,
Low Phase Change



Size 200
26.5 GHz
FEP or
ETFE jacket
triple shield



Size 235
18 GHz,
FEP or
ETFE jacket
triple shield



Size 300
18 GHz,
FEP jacket
triple shield



Size 450
10 GHz,
FEP jacket
triple shield

50 OHM COAX JUMPER ASSEMBLIES WITH LOW-LOSS CABLE AND PRECISION-GRADE CONNECTORS



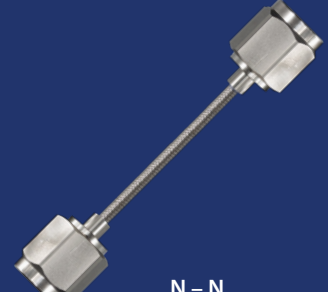
SMA
086 cable,
tinned-copper braid
DC-26.5 GHz



SMA
141 cable,
tinned-copper braid
DC-26.5 GHz



N - SMA
141 cable,
tinned-copper braid
DC-18 GHz



N - N
141 cable,
tinned-copper braid
DC-18 GHz

RF CONNECTOR ADAPTERS AND PROTECTIVE COVERS, PRECISION-GRADE



TNC-SMA
adapters



N-SMA
adapters



SMA-SMA
adapters



SMP-SMA
adapters



2.92-SMA
adapters



Protective covers
for RF connectors

HIGH-SPEED
CONNECTORS,
CONTACTS,
AND CABLES

HighSpeed

VersaLink™, SpeedMaster™, El Ochito®,
and other Signature high-speed
datalink connectors



SpeedLine
High-Speed Data Link Cables™

Glenair high-speed datalink
assemblies are proudly made
with Signature SpeedLine
high-speed cable

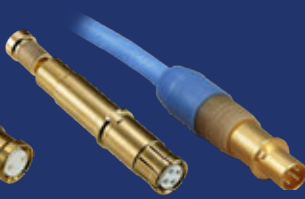
Glenair Signature high-speed interconnects are
optimized for all popular datalink protocol standards



RF / HIGH-SPEED DATALINK CONTACTS



Size #8 differential
twinax contacts



Size #8
quadrax contacts



Size #8 spring-loaded
BMB microwave contacts



Size #12 SMPM type
spring-loaded coaxial



G-LinkRF
SMA contact adapter

SIGNATURE

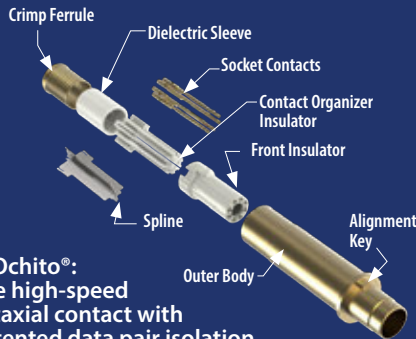
High-Speed Datalink Interconnect Solutions

up to 28 Gbps

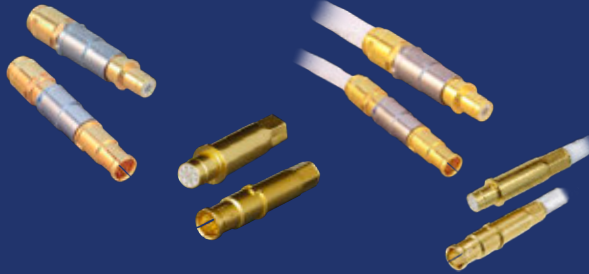


El Ochito

THE OCTAXIAL SIZE #8 CONTACT FOR GbE/10GbE ETHERNET, USB 3.0, HDMI, AND MORE

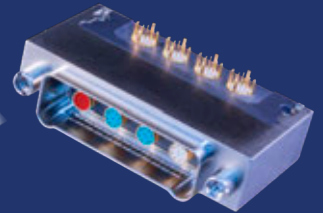


El Ochito®:
The high-speed octaxial contact with patented data pair isolation



Discrete contacts for D38999 Series III, Series 806 Mil-Aero, SuperNine®, ARINC 600, and Series 79 for both #24 and #26 gauge cable

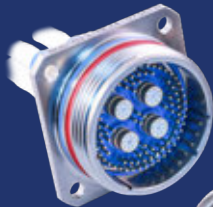
Turnkey jumpers with Cat 6A #24 or #26 gauge flexible aerospace cable



Series 79 right-angle PCB connector with El Ochito white (Ethernet), blue (USB 3.0), and red (100 Ohm HDMI, DVI, SATA, and PCI)



Series 882 SuperFly Datalink El Ochito nanominiature



Series 806 Mil-Aero high-speed El Ochito micro miniature



SuperNine MIL-DTL-38999 "Better than QPL" high-speed El Ochito



Series 792 Micro-Crimp precision-machined high-speed El Ochito



GLENAIR SIGNATURE HIGH-SPEED CONNECTOR SERIES



VersaLink micro miniature differential twinax with Signature Series 806, 795, and Micro-D packaging



High-Speed Micro-D TwistPin contact 10+Gb/sec. (example insert with four high-speed signal pairs)



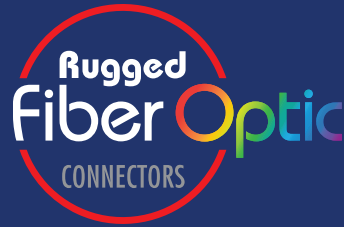
GMMD modular high-speed Micro-D RF / 10GbE connector



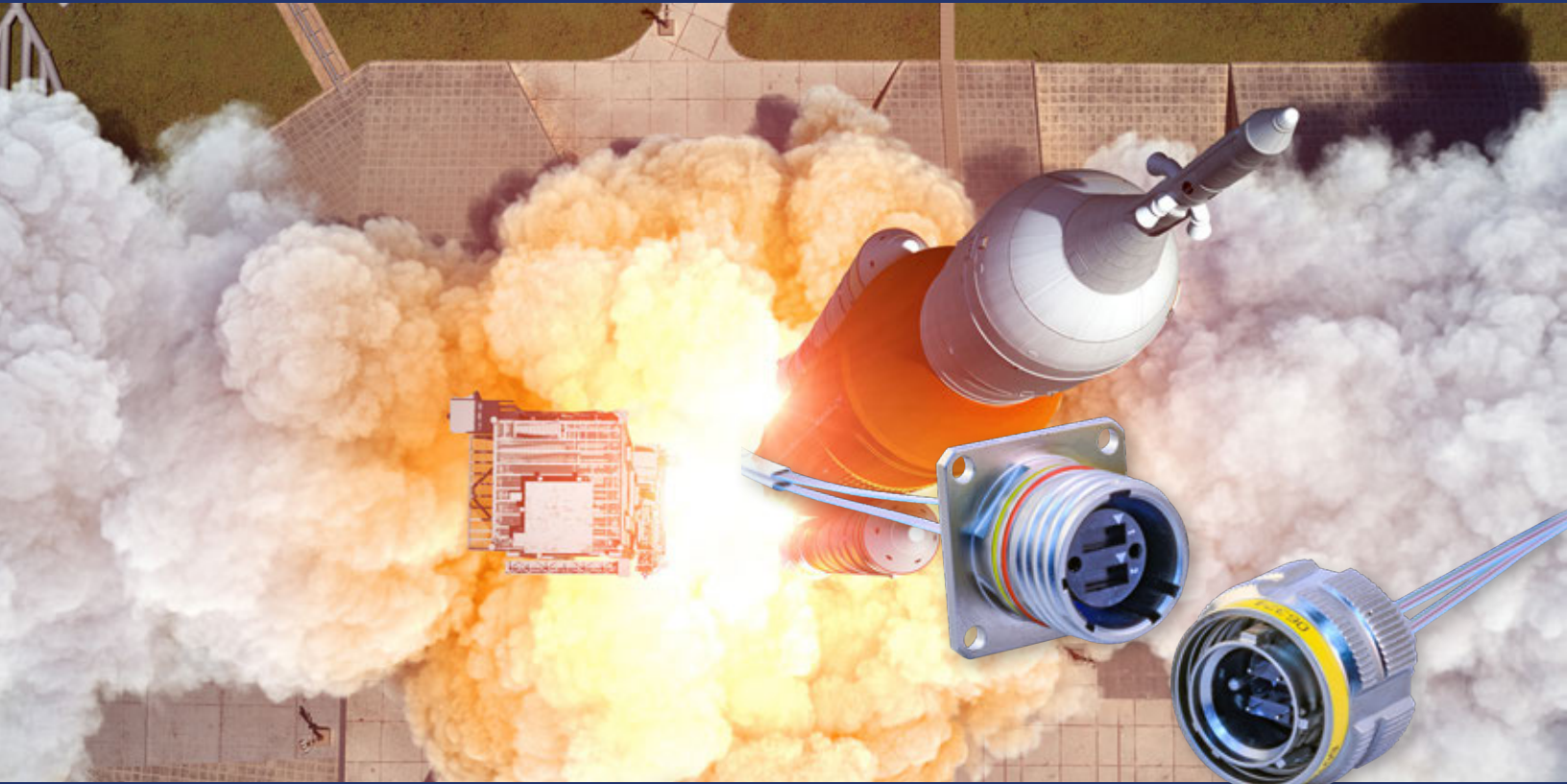
Speed-Master™ modular 10G+ Ethernet (shown in SuperNine® packaging)



RADIATION-
TOLERANT
SPACE-GRADE
FIBER OPTICS



Space-Grade Fiber Optic
Datalinks Including PRIZM
MT and MCX Ferrules
Plus Eye-Beam™ Power
Expanded-Beam for FSO



Glenair is pleased to introduce Eye-Beam Power, the world's first ruggedized, high-optical power terminus for multi-pin connectors, optimized for FSO applications.

EYE-BEAM POWER

- Rugged Size #8 drop-in expanded-beam optical contact
- Compatible with 1064nm polarization-maintaining fiber with a 0.5 dB typical insertion loss
- Low temperature rise at peak power

EYE-BEAM POWER: RUGGED HIGH-POWER FIBER OPTICS FOR FSO APPLICATIONS



SuperNine "better than QPL"
MIL-DTL-38999 Series III



Series 806 Mil-Aero
microminiature circular



Series 792 high-performance
micro rectangular

SPACE-GRADE Fiber Optic Connectors and Cables



Signature high-density and high-power fiber optic connection systems



Glenair US and UK are qualified by US Conec to terminate 1 and 2 row PRIZM[®] MT and ferrules for ribbon and round cable fiber

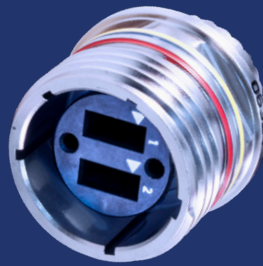
ABOUT MT FERRULE FIBER OPTICS

PRIZM[®] MT is a monolithic optical fiber ferrule that integrates microlenses and mechanical alignment features into a single component. The design provides low insertion loss and return loss for up to 32 fibers and is optimally resistant to debris contamination. Glenair supplies the PRIZM MT ferrule in factory-terminated cable assemblies for both inside-the-box as well as environmental point-to-point applications. Ruggedized aerospace-grade I/O and backplane connectors are also available for use with standard MT Elite[™] physical contact (PC) ferrules. MT Elite compatible connectors and ferrule kits are ordered separately for complete convenience in the implementation of both singlemode and multimode fiber optic datalinks.

SUPERNINE MT CONNECTOR CONFIGURATIONS



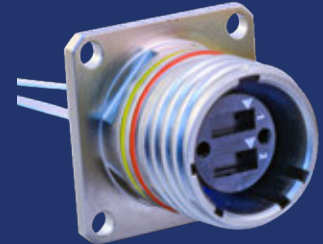
Cable Plug



In-Line Receptacle



Jam-Nut Receptacle



Panel-Mount Receptacles

SERIES 79 MT CONNECTOR CONFIGURATIONS



Plugs and receptacles with integrated banding porch, retaining plates, or EMI gasket for ribbon or round fiber media supporting both MT Elite[®] and PRIZM[®] MT ferrules.

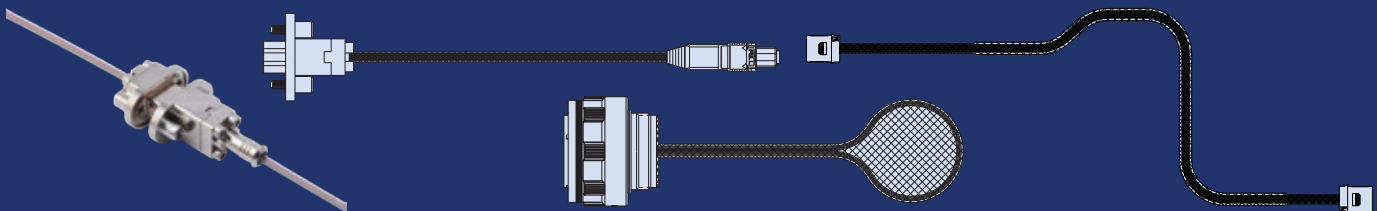
VITA 66 STYLE MT CONNECTORS



VITA 66.1 and 66.4 format. Discrete backplane connectors and MT ferrule assemblies.

CATALOG FAST-TURNAROUND "ASAP" MT OPTICAL FLEX JUMPERS AND CABLE ASSEMBLIES

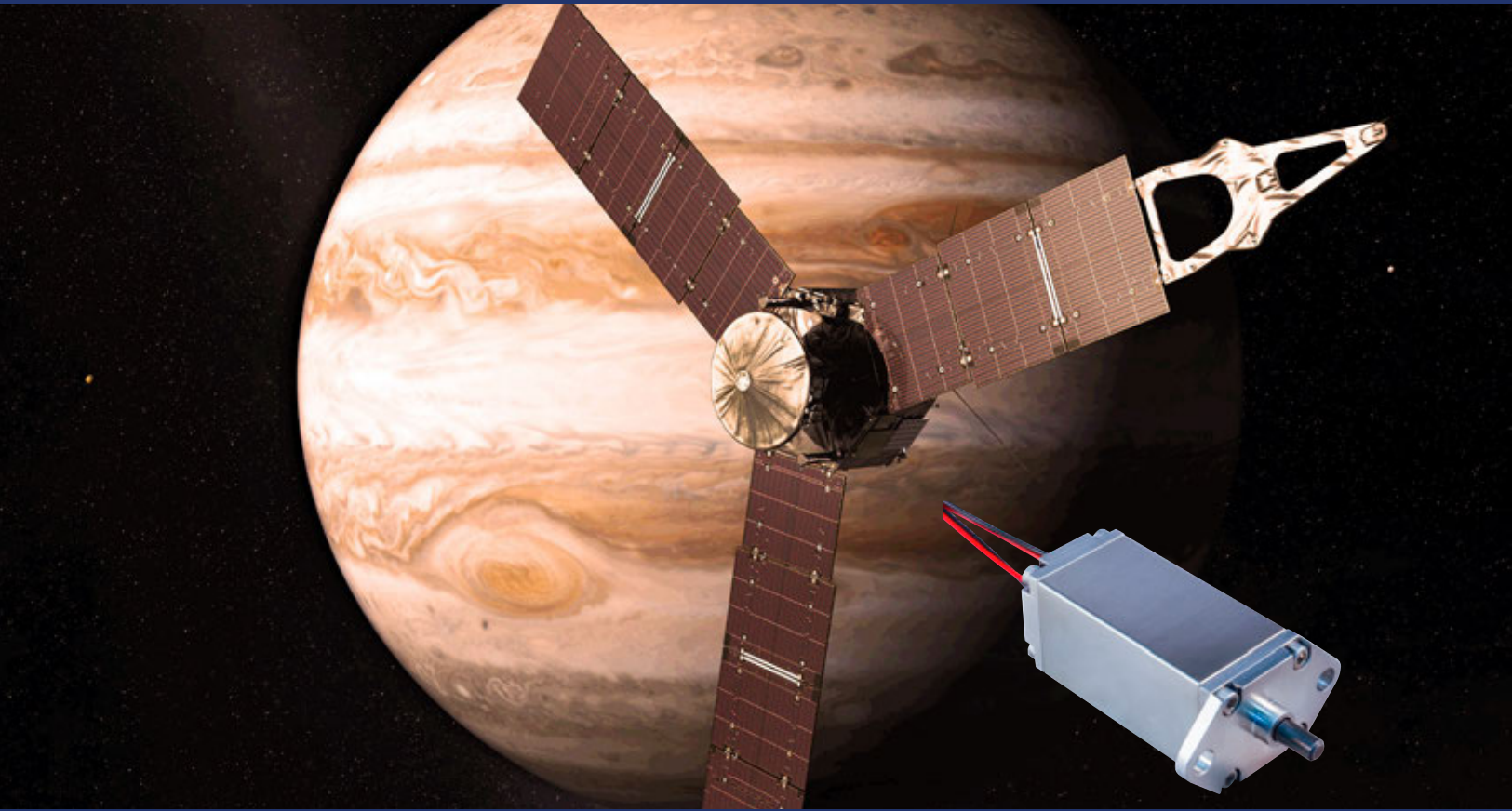
Glenair supplies—as a commercial off-the-shelf product—point-to-point optical flex jumpers with MT Elite and PRIZM MT optical ferrules. Available configurations include simple MT-to-MTP jumpers in straight or curved profiles, circular and rectangular I/O connectors with MT optical fiber pigtails, as well as special optical loop assemblies. A complete range of multimode and singlemode fiber in popular sizes, plus radiation-hardened fiber for earth orbit applications. Series 79- and SuperNine-to-MT ribbon fiber breakout cable assemblies available.



LIGHT, MEDIUM,
AND HEAVY-DUTY
PRELOAD
RETENTION AND
RELEASE



**Non-Pyrotechnic Hold Down
and Release Mechanisms—
US- and EU-made IAW local
standards and market
requirements**



**High-reliability, non-explosive (split-spool)
HDRMs, separation nuts, and pin pullers/
pushers for dependable preload retention
and release of deployable space systems**

Glenair pyrotechnic-free release mechanisms offer quick release time, low shock, relatively low power input, and virtually no temperature sensitivity. HDRM Series includes separation nuts, pin pushers, and pin pullers—direct wired or connectorized—with a broad range of preload carrying capacity. HDRM EU Series designed for ESA applications and standards.

- Pyrotechnic-free alternative (low-shock fuse-wire) for single-event release of deployable space systems—electrical initiation up to 5 amps
- Single-event device, user-serviceable and refurbishable
- Redundant or non-redundant actuation circuit
- Not susceptible to transient and noise (EMI/EMP/ESD/RFI) inputs
- Extended temperature ranges: -150°C to +150°C



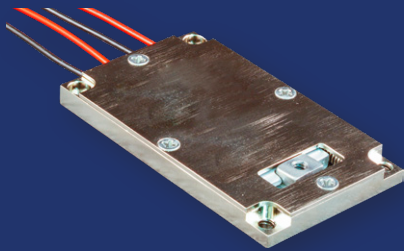
NON-PYROTECHNIC

Hold Down and Release Mechanisms

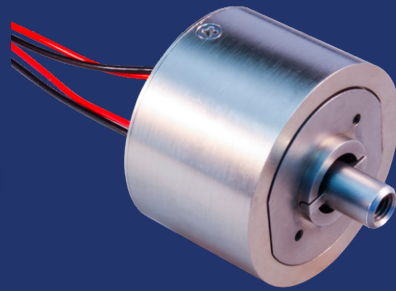


Separation nut, pin puller, and pin pusher configurations with flight heritage

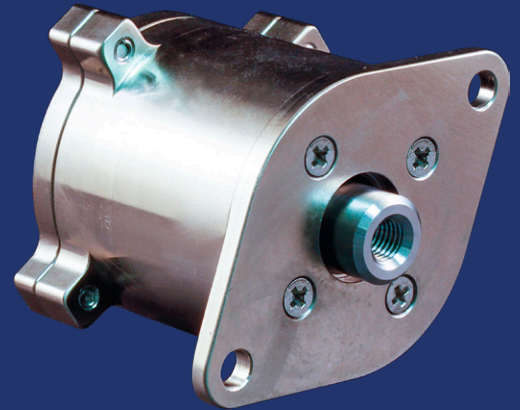
HDRM DUTY CLASSES



Light-Duty HDRM
Redundant circuit,
5 – 75 lb release preload

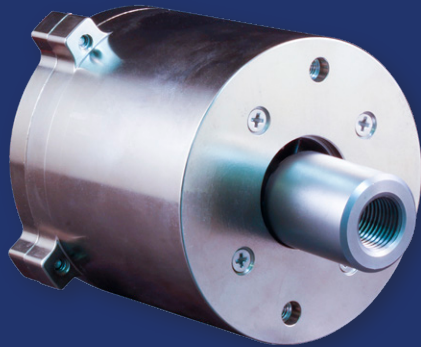


Medium-Duty HDRM
Redundant circuit,
300 – 4000 lb release preload

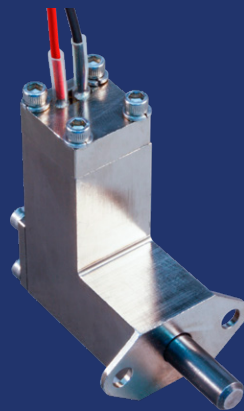


Heavy-Duty HDRM
Redundant circuit,
5000 – 20,000 lb release preload

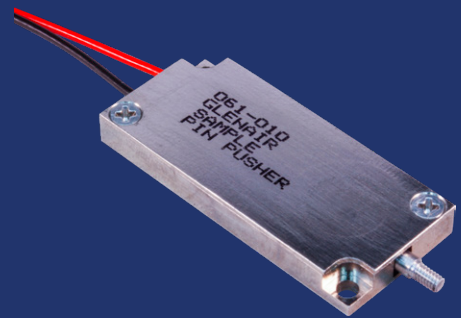
HDRM RELEASE TYPES



Separation nut



Pin puller



Pin pusher

EUROPEAN-MADE HDRM SOLUTIONS IAW ECSS-E-ST-33-01C SPACE MECHANISM STANDARD



Medium-Duty HDRM
Redundant circuit,
1.5 kN release preload



Medium-Duty HDRM
Redundant circuit,
11 kN release preload



Medium-Duty HDRM
Redundant circuit,
18 kN release preload

INTERSTAGE
AND SATELLITE
DEPLOYMENT
ADJUSTABLE
SEPARATION FORCE
CONNECTORS

 **SuperNine**[®] Space Mechanisms

**Blind-Mate, Float-Mount, and Assisted
Release Connectors with Adjustable
Separation Force and Misalignment Feature**



Available feed-thru
configurations

Blind-mate, fixed and float-mount interconnects for commercial launch, satellite, and military/defense applications

Application: Glenair Series 253 blind-mate connectors are designed for use in commercial rack-and-panel instrumentation applications, satellite deployment, scientific payloads, interstage, UAV, and munitions release, and more.

- Available in most symmetrical MIL-STD-1560 insert arrangements with contacts sizes from #23 to #8
- Selected materials offer low outgassing properties and high resistance to both corrosion and stress corrosion cracking
- NASA outgassing bake-out process available
- Designed to withstand the rigors of launch and flight—including shock, vibration, thermal vacuum, acceleration, and temperature extremes
- Crimp-removable contacts standard. PC tails, dual-flange standoffs, hermetically sealed, and custom blind-mate configurations available



SPACE-GRADE BLIND MATE SuperNine float-mount and adjustable separation force connectors

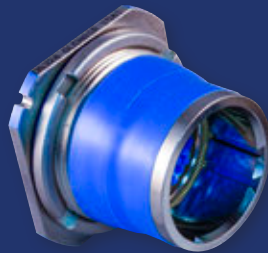


MIL-DTL-38999 Series III type, environmental, crimp contact

CRITICAL MECHANICAL FEATURES OF BLIND-MATE AND ADJUSTABLE SEPARATION FORCE (ZEF) CONNECTORS



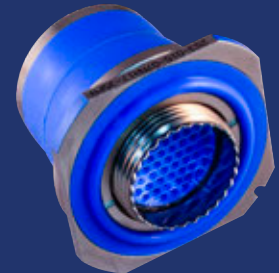
Roll-off nose: allows for the smooth disconnection of blind mate plugs and receptacles.



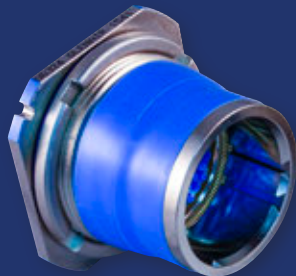
Float mounting: allows for coplanar movement of the receptacle during mating, preventing contact and shell damage.



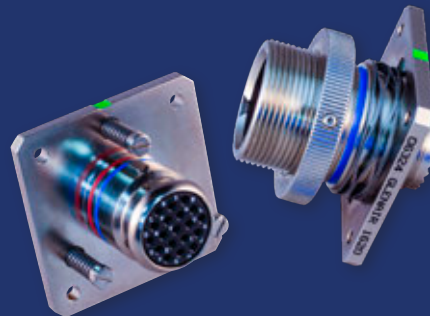
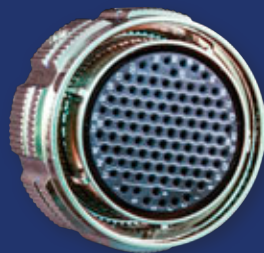
Misalignment accommodation: Radial, axial, and angular misalignment during mating is accounted for with integral wave springs.



Sealing: Misalignment accommodation makes environmental sealing difficult. The problem is solved with auxiliary external seals.



EMI shielding: Glenair incorporates ground springs in receptacle connectors and grounding fingers in special coupling nut-equipped plugs to optimize 360° shell-to-shell continuity.



Assisted separation force: Adjustable kick-off style with spring-loaded posts and an adjustment ring to calibrate separation force. A second style uses wave springs on the shell body.



Available non-ITAR environmental blind-mate and adjustable separation force solutions		
Basic Part No.	Description	Mates With
253-014	Fixed jam-nut mount plug with roll-on/roll-off nose and Accessory threads	253-015
253-015	Floating jam-nut mount receptacle with misalignment accommodation and optional sealing	253-014
253-016	Fixed wall mount plug with spring assist (zero separation force)	253-017
253-017	Floating wall mount receptacle with adjustable separation force and misalignment accommodation	253-016
253-018-07	Blind-mate feed-thru, jam-nut mount plug with B-side D38999 type receptacle mating interface and assisted kick-off (spring force)	253-019
253-018-G6	Blind-mate in-line feed-thru with B-side D38999 type plug mating interface and assisted kick-off (spring force)	253-019
253-019	Floating jam-nut mount receptacle with misalignment accommodation and optional sealing	253-018
253-031	Blind-mate jam-nut mount plug with kick-off spring and accessory threads	253-032
253-032	Floating jam-nut mount receptacle with misalignment accommodation	253-031
253-033	Float mount feed-thru, jam nut mount receptacle to 38999 type Series III plug mating interface	253-019
253-025	Locking circuit and test mate connector	253-016

INDUSTRY'S
BROADEST RANGE
"BETTER-THAN-
QPL" D38999
CONNECTORS

SuperNine® Environmental Connectors

The advanced-performance MIL-DTL-38999 Series III type connector for space applications



Designed for use in rugged vibration and shock applications, Glenair SuperNine is the only D38999-type series connector to pass the Bell Helicopter 299-100-B29 vibration testing

SuperNine® is a "Better-than-QPL" MIL-DTL-38999 series connector with outstanding durability, sealing, ease of shield termination, broad range of PC tail configurations, environmental and hermetic bulkhead feed-throughs, connector savers, as well as off-the-shelf EMI/EMP filter connectors and more—all with Glenair's legendary service, support, and product availability

ALSO AVAILABLE: D38999 SERIES I AND SERIES II BAYONET-LOCK CONNECTORS



D38999 Series I (scoop-proof) and Series II (low-profile) bayonet-lock connectors in Class G space-grade configurations

SERIES 23

SuperNine®

MIL-DTL-38999 Series III Type

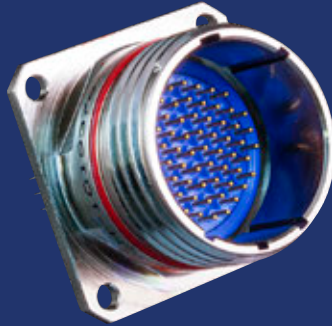
Advanced performance aerospace / defense connectors



RUGGED, HIGH VIBRATION AND SHOCK COUPLING AND MATING TECHNOLOGY



Anti-decoupling, high vibration ratcheting coupling nut for ultimate safety and reliability



Triple-start stub ACME mating thread profile for fast mate and demate during maintenance cycles



Special-purpose high-power in MIL-DTL-38999 Series III packaging

BROAD RANGE OF PC TAIL STANDOFF DESIGNS FOR I/O-TO-BOARD APPLICATIONS



Dual standoff design for superior resistance to vibration and shock

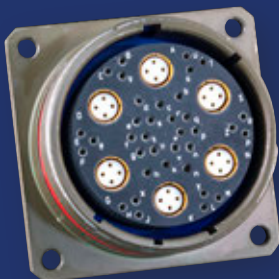


EMI / RFI planar-array filter connector for critical avionic systems



Ultra low-profile flat configuration for reduced package size applications

HIGH-SPEED AND RF DESIGNS FOR SENSORS AND SATELLITE UPLINK DATA COMMS



Industry-standard Quadrax-equipped layouts for signal and high-speed data



Ultra-light weight Octaxial contacts for 10Gb data transfer per contact



High-frequency RF designs for satcom communications

COTS AND CUSTOM
ENVIRONMENTAL
AND HERMETIC
EMI/RFI FILTER
CONNECTORS



EMI/RFI Filter Connectors
and EMP Suppression:
Planar Array Power, Signal,
and TVS Solutions



Planar filter array and TVS diode connectors diodes in standard catalog as well as build-to-order configurations

- Planar, multilayer ceramic capacitive filters, with and without transient voltage suppression diodes
- Space-grade plating and outgassing processing
- C and Pi electrical configurations
- PC tail, crimp or solder cup termination
- 35 – 240,000 pF capacitance
- Fast and reliable diode burn-in and test services
- Turnkey in-house manufacturing of all filter connector elements and processes

Table I: Capacitor Array Code / Capacitance Range

Class	Pi - Circuit (pF)	C - Circuit (pF)
X	160,000 - 240,000	80,000 - 120,000
Y	80,000 - 120,000	40,000 - 60,000
Z	60,000 - 90,000	30,000 - 45,000
A	38,000 - 56,000	19,000 - 28,000
B	32,000 - 45,000	16,000 - 22,500
C	18,000 - 33,000	9,000 - 16,500
D	8,000 - 12,000	4,000 - 6,000
E	3,300 - 5,000	1,650 - 2,500
F	800 - 1,300	400 - 650
G	400 - 600	200 - 300
J	70-120	35-60



Planar filter arrays and TVS diodes may also be incorporated into rectangular connector packaging such as the Micro-D and Series 79 Micro-Crimp devices shown here.

SPACE-GRADE
EMI/EMP Filter connectors



Innovative designs · total vertical integration



Extended-shell
PC-tail cylindrical filter
with threaded standoff



Special-purpose
filter connector cable
adapter (Sav-Con®)



Custom reduced-length
sidecar filter connector design



Series 80 Mighty Mouse
PC-tail filter receptacle



Series 80 Mighty Mouse
solder-cup filter receptacle
with integrated banding porch



MIL-DTL-38999 type
crimp-contact termination
filter receptacle



MIL-DTL-38999 Series
III type EMP TVS diode-
equipped filter connector



MIL-DTL-83723 type filter
connector, gold-plated for atomic
oxygen corrosion resistance



Quick-disconnect circular with
solder-free contact filter array

SPACE - GRADE
HERMETIC
SEALING
CONNECTOR
SOLUTIONS



Best-of-Class Hermetic Seal
Connector Designs



Resolve gas, moisture and particle
ingress problems with
conventional glass-sealed
hermetic or advanced
CODE RED lightweight
encapsulant-sealed
designs



ALL SOLUTIONS DELIVER

- Superior pressure resistance to 32,000+ PSI
- Higher resistance to extreme operating temperatures to 260°+ C
- Superior mechanical strength
- No material breakdown or aging over time
- Helium leak rate $<1 \times 10^{-7}$ cc/sec to 1×10^{-10}

CODE RED

LIGHTWEIGHT HERMETIC SEALING

Lightweight hermetic encapsulant sealing solution with 1×10^{-7} leak rate performance. Available today in Mighty Mouse 806 Mil-Aero, M24308/9 D-Sub and D38999/23



Aluminum shell CODE RED hermetic connectors and copper contacts reduce weight and improve electrical performance compared to heavier-duty glass-to-metal seal hermetic solutions

ADVANCED PERFORMANCE

Glass-Sealed Hermetic Connectors

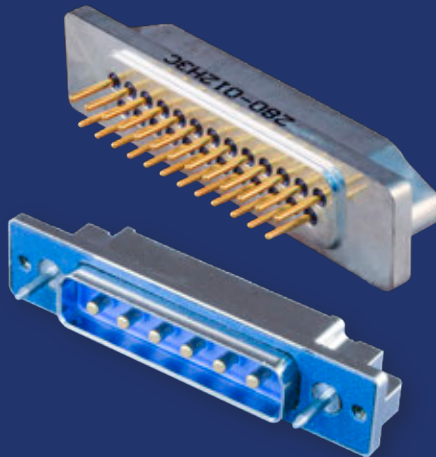


Thousands of same-day-availability part numbers

UNIQUE HERMETIC OFFERINGS AND CATALOG (COTS) SOLUTIONS



Coax, Triax, Quadrax and hybrid-contact layouts



Rectangular hermetics including Series 28 HiPer-D and Series 79



E1 Ocho high-speed octaxial contacts in a lightweight CODE-RED sealed bulkhead feed-thru



Triax hermetic



Hermetic Sav-Con Feed-thrus and Gender Changers



Dual-flange PC tail hermetic



Hermetic with crimp-removable contacts



Hermetic bulkhead penetrators



Hermetic receptacles with integrated band porch

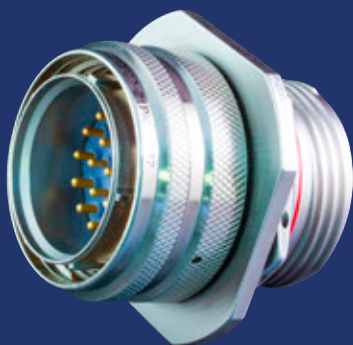
CIRCULAR AND
RECTANGULAR
FLIGHT-GRADE
AND GROUND TEST
APPLICATIONS



Flight-Proven Connector Savers
and Bulkhead Feed-Thrus



The smart solution for preventing contact damage and extending the service life of cable assemblies and box and panel-mount receptacles



Series changers and gender changers available in both Sav-Con® and bulkhead feed-thru configurations



circular and rectangular configurations available including hermetic and EMI/RFI filter configurations

- Sav-Con®s for every Military Standard connector—circular and rectangular
- Hundreds of successful space launch and space flight applications
- Bulkhead feed-thrus for environmental, filter and hermetic applications
- Pin/pin, pin/socket, and socket/socket versions
- Traditional plug-receptacle savers, as well as in-line versions and gender changers
- Available EMI/EMP filter savers and adapters
- Optional locking mechanism

HIGH-PERFORMANCE CONNECTOR GO-BETWEENS

Sav-Con® Connector Savers and Bulkhead Feed-Thrus



Each Glenair Sav-Con® Connector Saver meets the military specification performance requirements of its mating connector. Glenair manufactures and supplies a Sav-Con® connector saver for every military standard connector currently in use including:

- MIL-DTL-26482 Series I and II
- MIL-DTL-28840
- MIL-DTL-38999 Series I, II and III
- MIL-DTL-83723
- LN 29729 (SJT)
- PATT 105 and PATT 602
- MIL-DTL-5015
- Series 801 and 805 Mighty Mouse
- Series 89 Nanominiature
- M24308 D-Subminiature
- MIL-DTL-83513 Micro-D Subminiature
- Series 28 HiPer-D M24308 intermateable
- Series 79 Micro-Crimp

Comprehensive materials, plating, and polarization options available

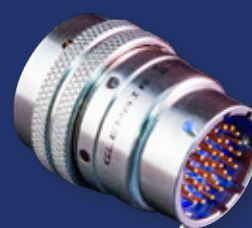
TRADITIONAL PLUG-RECEPTACLE SAV-CON® CONNECTOR SAVERS



MIL-DTL-38999 series III type



Series 89 Nanominiature rectangular



MIL-DTL-38999 series II bayonet-coupling saver



Series 80 Mighty Mouse Sav-Con®

BULKHEAD FEED-THRUS



Special high-voltage power bulkhead feed-thru



Special wide panel accommodation Mighty Mouse bulkhead feed-thru



MIL-DTL-5015 bulkhead feed-thru

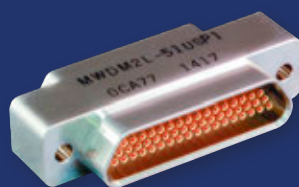


Special non-cadmium plating classes

SPECIAL-PURPOSE ADAPTERS AND SAVERS



EMI/RFI filter Sav-Con® adapter (D38999 Series III type shown)



Rectangular EMI/RFI filter Sav-Con adapter (MIL-DTL-83513 type shown)



Power distribution connector savers (MIL-D-5015 type shown)



TRL 9
PROVEN FLIGHT
HERITAGE MICRO
MINIATURE
CONNECTOR

SERIES
806
MIL-AERO

Advanced performance,
reduced size and weight
connector series IAW
MIL-DTL-38999



Series 806 offers significant size and weight savings while meeting all key performance benchmarks of MIL-DTL-38999 Series III for a broad range of space flight applications including sensors, telemetry, power, and system databus.

SIZE AND WEIGHT SAVING SOLUTIONS: CATALOG OR CUSTOM



High-availability catalog solutions plus custom designs such as this unique Quadrax implementation

- Next-generation small form factor aerospace-grade circular connector
- Designed for harsh application and high-altitude environments
- Robust and reliable anti-decoupling technology
- High density 20HD, 22HD, RF, and high-speed contact arrangements
- Lightweight hermetic and filter versions
- +200°C temperature rating
- Improved ramp angle on mating interface for better vibration and shock resistance

Series 806 Mil-Aero Micro Miniature Circular Connectors



for space-grade applications

SERIES 806 MIL-AERO: FEATURES / SPECIFICATIONS

- High-density #20HD and #22HD arrangements for reduced size and weight
- Supported wire sizes:
#20HD contacts 20–24 AWG
#22HD contacts 22–28AWG
- Dielectric withstanding voltage
#20HD layouts: 1800 Vac
#22HD layouts: 1300 Vac
- Reduced pitch triple-start modified anti-decoupling stub ACME mating threads
- +200°C operating temperature
- “Triple ripple” wire sealing grommet (75,000 ft. rated)
- Snap in, rear release crimp contacts
- Metal contact retention clips
- Integral Nano-Band shield termination platform
- EMI shielding effectiveness per D38999M para. 4.5.28 (65 dB min. leakage attenuation @ 10GHz)
- 10,000 amp indirect lightning strike
- MIL-S-901 Grade A high impact shock

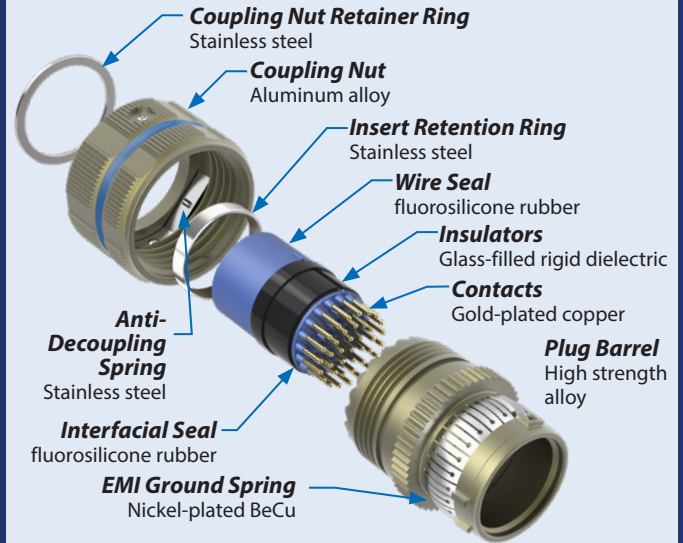
AVAILABLE LIGHTWEIGHT ALUMINUM “CODE RED” HERMETICS

CODE RED is a lightweight encapsulant sealing and application process with 50% package-weight savings compared to glass-to-metal seal Kovar/stainless steel solutions.

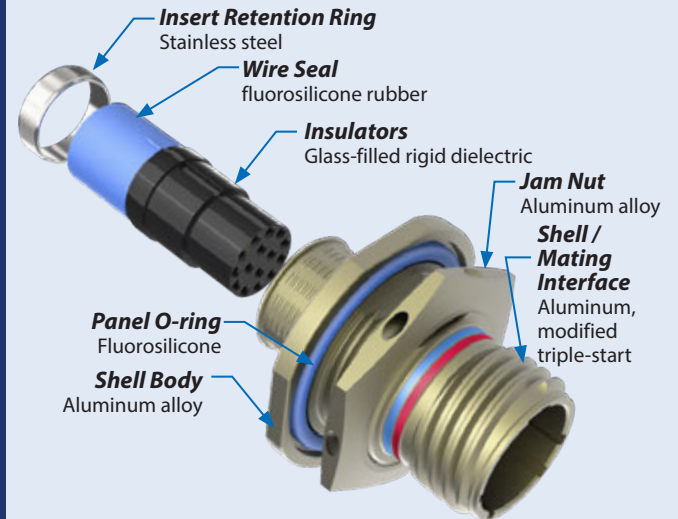
Non-outgassing CODE RED (IAW NASA/ESA) provides durable hermetic sealing with better than 1×10^{-7} leak rate performance. Gold-plated copper contacts deliver outstanding low-resistance current carrying capacity.



SERIES 806 MIL-AERO PLUG

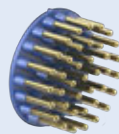


SERIES 806 MIL-AERO RECEPTACLE



SMALLER AND LIGHTER WITH EQUAL D38999 PERFORMANCE?

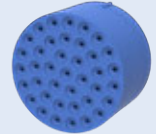
High-Density Layouts
Twice as many contacts in a smaller package



“Top Hat” Insulator
High voltage rating, foolproof alignment



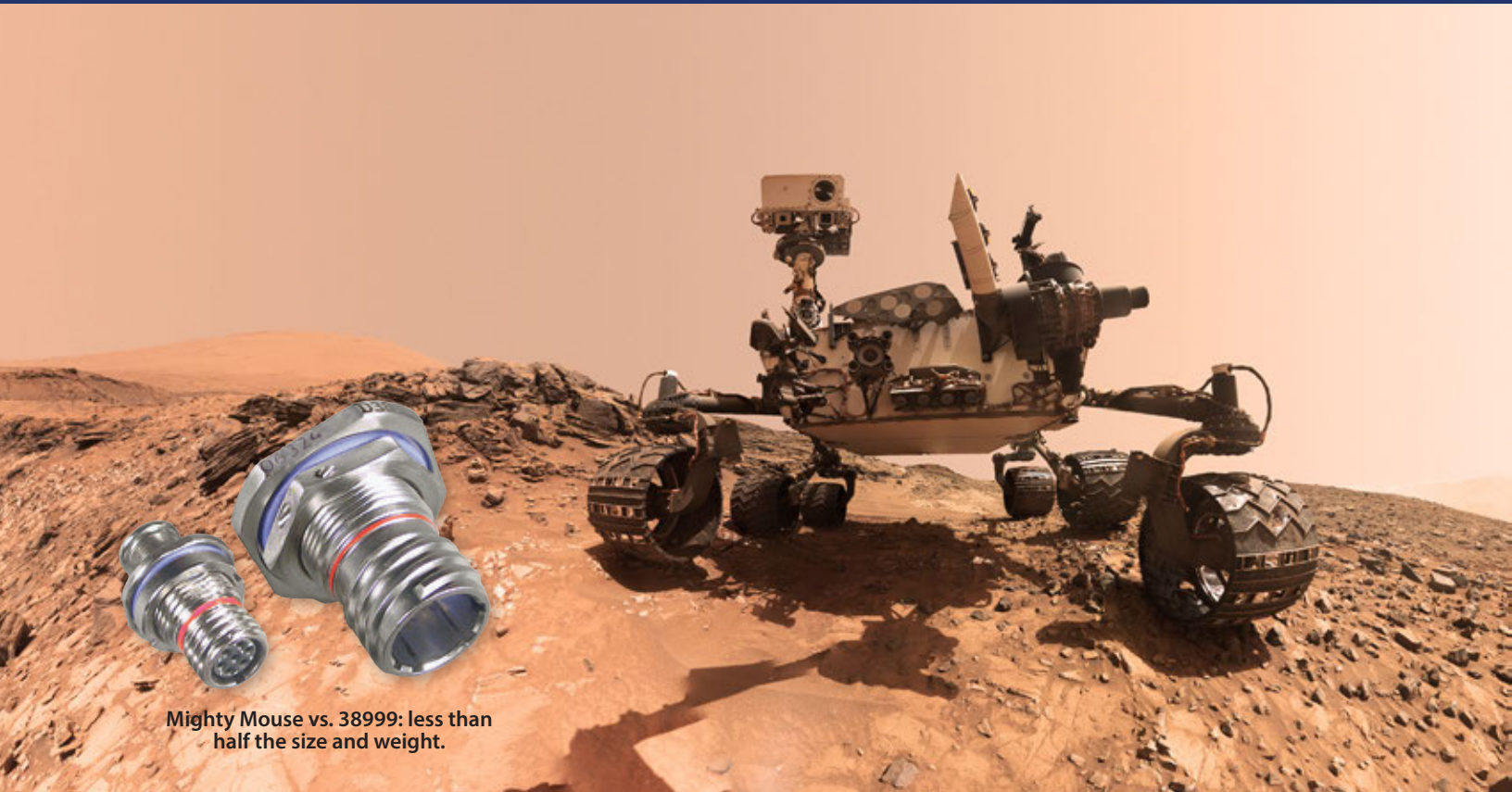
Triple Ripple Wire Seal
Reliable 75,000 ft. altitude immersion



INDUSTRY - LEADING
MINIATURIZATION,
PERFORMANCE, AND
AVAILABILITY



Mighty Mouse micro
miniature connector series
for optimized SWaP

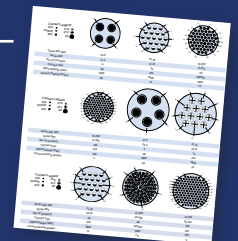


Mighty Mouse vs. 38999: less than half the size and weight.

Mighty Mouse Connectors: Reducing the Size and Weight of Space-Grade Wiring Systems

- 8 coupling styles and 67 contact arrangements from 1 – 130 contacts
- MIL-DTL-38999 caliber performance
- Size #23, #22, #20, #20HD, #16, #12, #8 signal, power, RF, and high-speed contacts
- Discrete connectors and turnkey cable assemblies

FULL RANGE OF SUPPORTED CONTACTS, 67 CONTACT ARRANGEMENTS

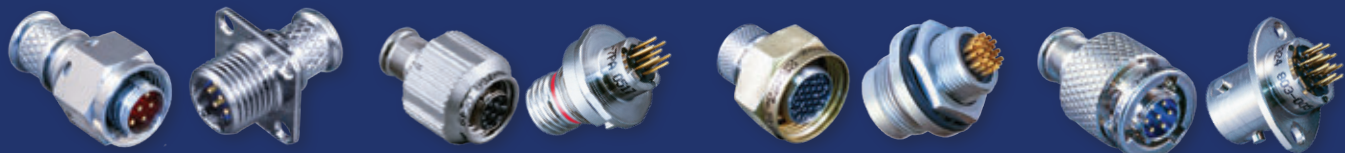


67 arrangements,
from 1–130 contacts

SERIES 80 MICRO MINIATURE
Mighty Mouse Connectors and Cables
 Awesome performance, itty-bitty package



CHOOSE FROM 8 DIFFERENT COUPLING DESIGNS



Series 800
UN thread

Series 801
double-start ACME thread

Series 802
AquaMouse UNEF thread

Series 803
bayonet coupling



Series 804
quick-disconnect

Series 824
locking quick-disconnect

Series 805
triple-start thread, size #23
contact layouts

Series 806
modified triple-start, size #22HD
and #20HD layouts

AVAILABLE MIGHTY MOUSE CONNECTOR CLASSES



IP67
environmental



Glass-to-metal seal
hermetic



CODE RED
Lightweight hermetic



EMI/RFI
Filter



EMP Transient Voltage
Suppression



Bulkhead feed-thrus and
penetrators



Sav-Con[®]
connector savers



High-frequency
RF / Microwave

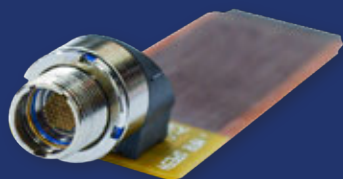


High-speed
Ethernet

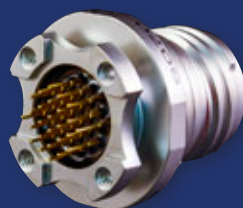


Single- and multimode
fiber optic

AVAILABLE COTS SPECIAL-PURPOSE DESIGNS AND PACKAGING



High-density flex jumpers



Double-standoff PC tail



Special feed-thrus

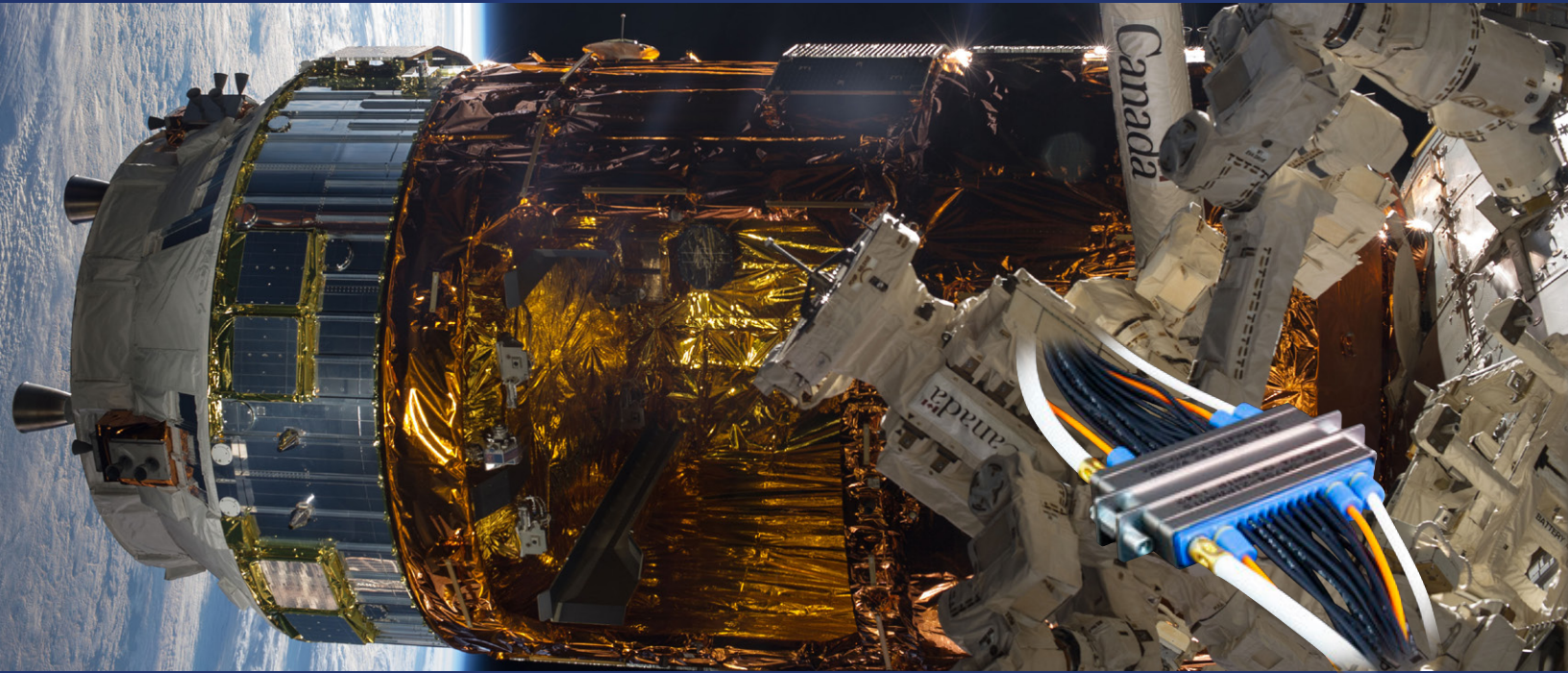


Shielded cable assemblies

HIGH-PERFORMANCE
STANDARD,
HIGH-DENSITY,
POWER, AND
HIGH-SPEED



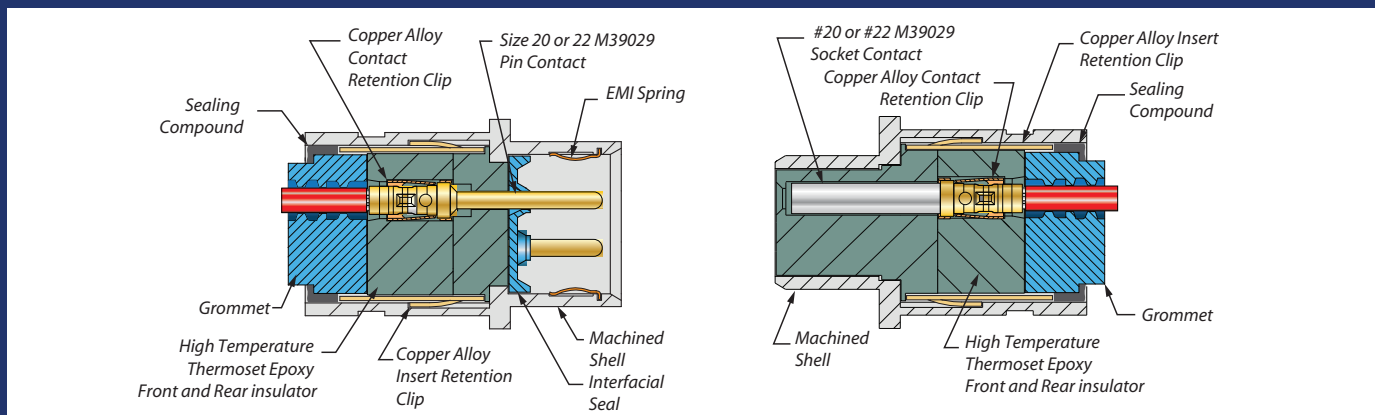
Advanced-Performance HiPer-D Connectors—Aerospace-Grade M24308 Intermateable



HiPer-D: the advanced-performance M24308 intermateable with one-piece precision-machined shells and enhanced shielding, sealing, and high temperature and vibration tolerance

- 200° continuous operating temperature
- Integrated ground spring for EMI/RFI protection
- 11 standard and 20 combo insert arrangements
- High-temp insulators
- Fluorosilicone seals (NASA outgassing available)
- Rugged machined shells

STANDARD AND HIGH DENSITY HiPer-D® - CUTAWAY



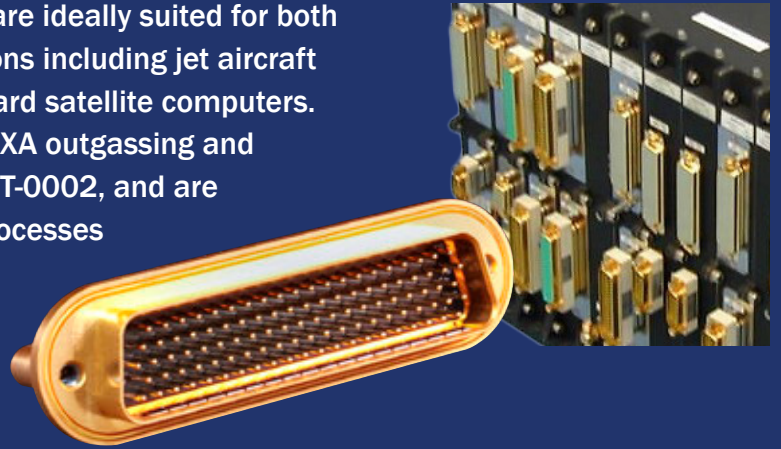
SERIES 28

HiPer-D Aerospace-Grade M24308 Connectors



Precision-machined · shielded · sealed

Glenair HiPer-D M24308 D-sub connectors are ideally suited for both high-altitude and exoatmospheric applications including jet aircraft avionic systems and military defense on-board satellite computers. Connectors are supplied with NASA/ESA/JAXA outgassing and screening in accordance with NASA EEE-INST-0002, and are fabricated with materials and production processes designed to eliminate the broad range of electrical, mechanical, and environmental failure modes endemic in stamped-and-formed connector packaging.



HiPer-D High-Performance D-Sub vs. MIL-STD-24308		
Specification / Feature	M24308	HiPer-D
Temperature	-55°C to +125°C	-65°C to +200°C
Insulator	Thermoplastic	Thermoset Epoxy
Shell	Steel (Brass)	Aluminum (SST)
Voltage	1000 VAC	1000 VAC
Grounding	Dimples in shell (not in Mil-Spec)	Nickel-plated Copper Alloy EMI spring
Environmental	No	Yes
Vibration, sine	20 g	60 g
Vibration, random	N/A	43 g
Shock	50 g	300 g
Bolt-on backshells	No	Yes

HIPER-D M24308 COMBO-DS FOR POWER, SIGNAL, AND RF APPLICATIONS

- Size #8 power and 50 ohm or 75 ohm RF contacts
- Mixed layouts with #8's and #20's
- 200°C continuous operating temperature
- 20 tooled layouts
- Crimp and PC tail terminations



HIGH-SPEED HIPER-D HIGH-PERFORMANCE M24308

Crimp contact non-environmental connectors with #8 contacts for high-speed data transmission

- One-piece rugged machined aluminum shell
- Two to five size 8 Coax, Twinax, or Quadrax contacts
- Common ground plane (no insulators)
- Available in straight and right angle PCB versions
- Non scoop-proof solution. For scoop-proof rectangular connector requirements, see Series 792



HIGHEST
RELIABILITY
MINIATURE
CRIMP-CONTACT
RECTANGULAR



Precision-machined
micro-miniature rectangular
connector for demanding
aerospace applications



Originally designed for NASA's Orion project, the 791's small size and blind mate capability make it a perfect choice for 2U and 3U electronics modules. Applications include radars, satcom, exoatmospheric vehicles, flight avionics, power distribution units, and satellite instrumentation.

Polarized / keyed shells prevent mis-mating and allow designers to specify identical layouts side-by-side without risk of circuit damage

- Next-generation small form factor aerospace-grade rectangular connector approved for manned space flight
- Scoop-proof recessed pin contacts
- 37 arrangements; 12 shell sizes; size 23, 16, 12 and 8 contacts
- Environmental
- EMI shielded
- Guide pins for blind mate modules



Prevent mis-mating with Mod Code 555 special keying option

Next-generation micro-miniature rectangular for demanding space applications



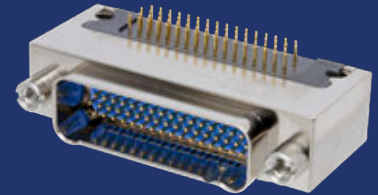
FEATURES OF SERIES 791 COMPARED TO MICRO AND D-SUBMINIATURE CONNECTORS



Higher-density crimp-contact insert arrangements



High-density power and mixed power-and-signal arrangements



Fully-shrouded straight and right-angle PC tail configurations



Panel-mount design with O-ring sealing



Scoop-proof mating interface



Float-mount designs for rack-and-panel applications



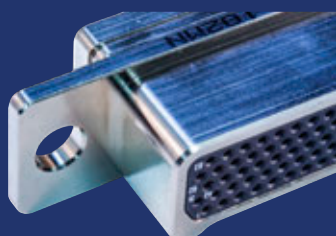
Rugged-construction dual polarization lobes



Special keying option prevents mis-mating



Integrated banding porch for shield termination



Rear-end backshell accommodation



COTS-configuration with rugged MT fiber optic ferrule



Panel-mount version with available EMI ground spring

10GB ETHERNET,
USB 3.0, HDMI
HIGH-SPEED
DATALINK
CONNECTOR



The next-generation micro miniature rectangular connector with El Ochito contacts for high-speed aerospace applications



The robotics workstation inside the ISS cupola

SpeedLine
High-Speed Data Link Cables

The Series 792 connector brings high-speed data-rate performance to the Glenair Series 79 rectangular family. Size 8 cavities accept standard Quadrax or El Ochito® shielded octaxial contacts making it a perfect choice for radars, weapons systems, mission computers and displays, communications gear, and more.



El Ochito®

- High-speed Ethernet, USB 3.0, HDMI, and DisplayPort
- Industry-leading SpeedLine high-speed data link cable assemblies
- PCB-mount and cable
- Scoop-proof interface
- 12 arrangements, 6 shell sizes, from 1 to 9 way
- Precision-machined dual-lobe polarized shells
- Integrated EMI shielding and grounding
- Blind mate environmental

HIGH-SPEED Series 792



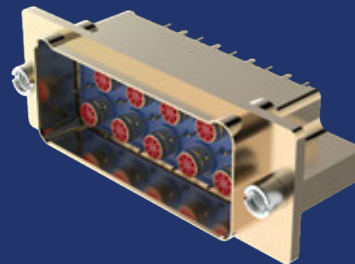
The next-generation micro miniature rectangular for high-speed aerospace applications

DESCRIPTION	REQUIREMENT	PROCEDURE / NOTES
Operating temperature	-65° to +175°C	EIA-364-32 Test Condition IV
Current rating	1.5 Amps (datalink contacts) 5 Amps (Size #23 contacts)	Datalink contacts tested: El Ochito® White
DWV (sea level)	750 VAC (Size #23 contacts) 1000 VAC (datalink contacts)	EIA-364-20
Insulation resistance	5000 MΩ minimum	EIA-364-21
Contact resistance, 25°C	55 millivolt maximum	EIA-364-06, 1.0 A test current, #24 AWG wire

DESCRIPTION	REQUIREMENT	PROCEDURE / NOTES	
Shell-to-shell resistance	2.5 millivolt maximum	EIA-364-83	
Shielding effectiveness	Frequency	Attenuation dB	EIA-364-66
	100	75	
	1000	50	
	3000	44	
	6000	38	
10000	35		
Ingress protection	IP67 rating	IEC-60529	



Twinax, Quadrax and El Ochito®
Connectors are available in three configurations: twinax for a single high-speed wire pair, quadrax for two data pairs, and El Ochito® for four.



Up to 9 data ports

The Series 792 Size F with nine ports is the largest connector in the series and is the only two row version. Sizes A – E, with one to five ports, are single row.



PCB Connectors

Series 792 PCB connectors have straight or right angle PC tails. Contacts are non-removable and are epoxy sealed.



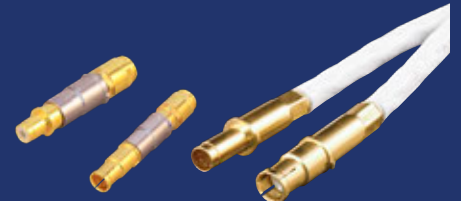
Panel Mount

Panel mount connectors have O-ring and threaded mounting holes for easy installation and are available with guide pins and float mounts.



Cable Connectors

High-speed shielded contacts snap into Series 792 cable connectors and are easily removed with a standard plastic tool.



El Ochito® Contacts and Jumpers

El Ochito® octaxial contacts and jumpers supplied for Ethernet, SuperSpeed USB, HDMI, DisplayPort, SATA and other multi-gigabit protocols.

El Ochito® octaxial contacts are intended for harsh environment military and aerospace data networks, and provide up to 50% total weight savings and 20 times faster data rates compared to legacy quadrax-based solutions.



El Ochito®
White
GbE
10GbE



El Ochito®
Blue
USB 3.0



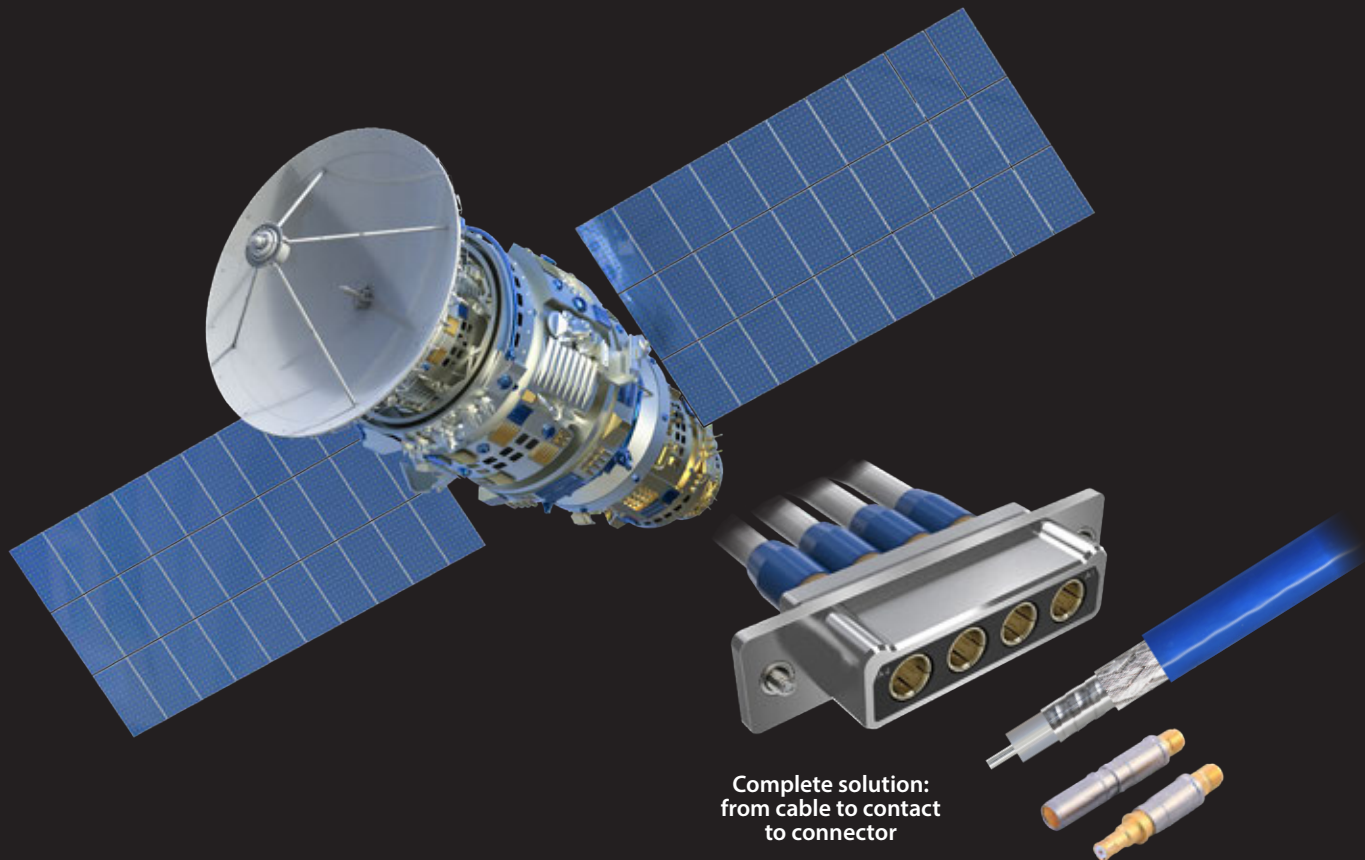
El Ochito®
Red
HDMI, SATA,
DisplayPort

- Snap-in, rear release octaxial contact for use with aerospace-grade high-speed cable
- Environmentally protected
- Support for all major high-speed datalink protocols
- Significant size and weight savings compared to quadrax

FLIGHT-GRADE
MULTI-PORT
HIGH-FREQUENCY
RECTANGULAR
COAX CONNECTOR

SERIES™
795
RF

Precision-machined, scoop-proof
aerospace-grade Coax connector
for RF, Microwave, and mmWave
applications



Series 795 RF connectors have up to nine cavities for conventional size #8 RF contacts as well as Glenair innovative G-LinkRF BMB-to-SMA contacts. The scoop-proof dual-lobed shell protects the mating interface from mechanical abuse and hostile environments. Series 795 connectors are optimized for use with Glenair Series 852 high-frequency contacts. Contacts snap into connector body and are removable. These contacts accept high performance low-loss flexible cable.

- Two to nine ports for size #8 BMB-type coax contacts
- Single and double row insert arrangements
- Scoop-proof mating interface
- Precision-machined aluminum shell with lobed polarization
- Environmentally sealed
- EMI grounding fingers for optimal shielding performance
- Fully shrouded PCB terminal-to-board back end

HIGH-PERFORMANCE

Series 795 RF



Multi-port micro miniature rectangular with drop-in support for high-frequency RF contacts and cable

The Series 795 RF accepts a range of drop-in 50 and 75 Ohm contacts that enable RF transmission system designers to reduce the size, weight, and space requirements compared to conventional single-line coax connectors and adapters. Innovative G-LinkRF contacts save assembly time and labor.



For use with BluMarkRF cable
962-025-086

#8

Series 795
Series 806 RF

G-Link^{RF}



50 Ohm
26.5 GHz
852-256
852-157

852-071 Pin




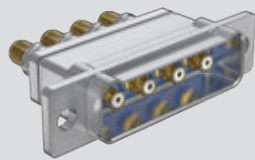
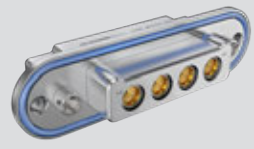
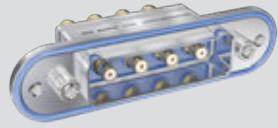

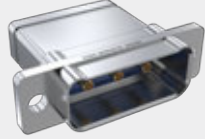



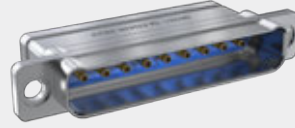
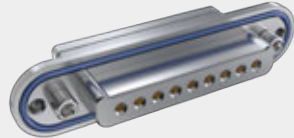
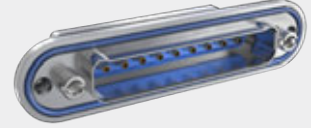
852-152 Socket



Size 8 for use with
-086 cable
18 GHz BMB interface
50 Ohm
Solder termination

Snap-in, rear release
pin and socket coax
contacts, spring-loaded.

Series 795 RF Connector Selection Guide

Cable Plugs, Socket Contacts	Cable Receptacles, Pin Contacts	Panel Mount Plugs, Socket Contacts	Panel Mount Receptacles, Pin Contacts
 795-001S (#8 BMB Contacts)	 795-002P (#8 BMB Contacts)	 795-003S (#8 BMB Contacts)	 795-004P (#8 BMB Contacts)
 795-005S (#12 SMPM Contacts)	 795-006P (#12 SMPM Contacts)	 795-007S (#12 SMPM Contacts)	 795-008P (#12 SMPM Contacts)
 795-009S (#16 SMPS Contacts)	 795-010P (#16 SMPS Contacts)	 795-011S (#16 SMPS Contacts)	 795-012P (#16 SMPS Contacts)



BLUMARK
COAX CABLES **RF**

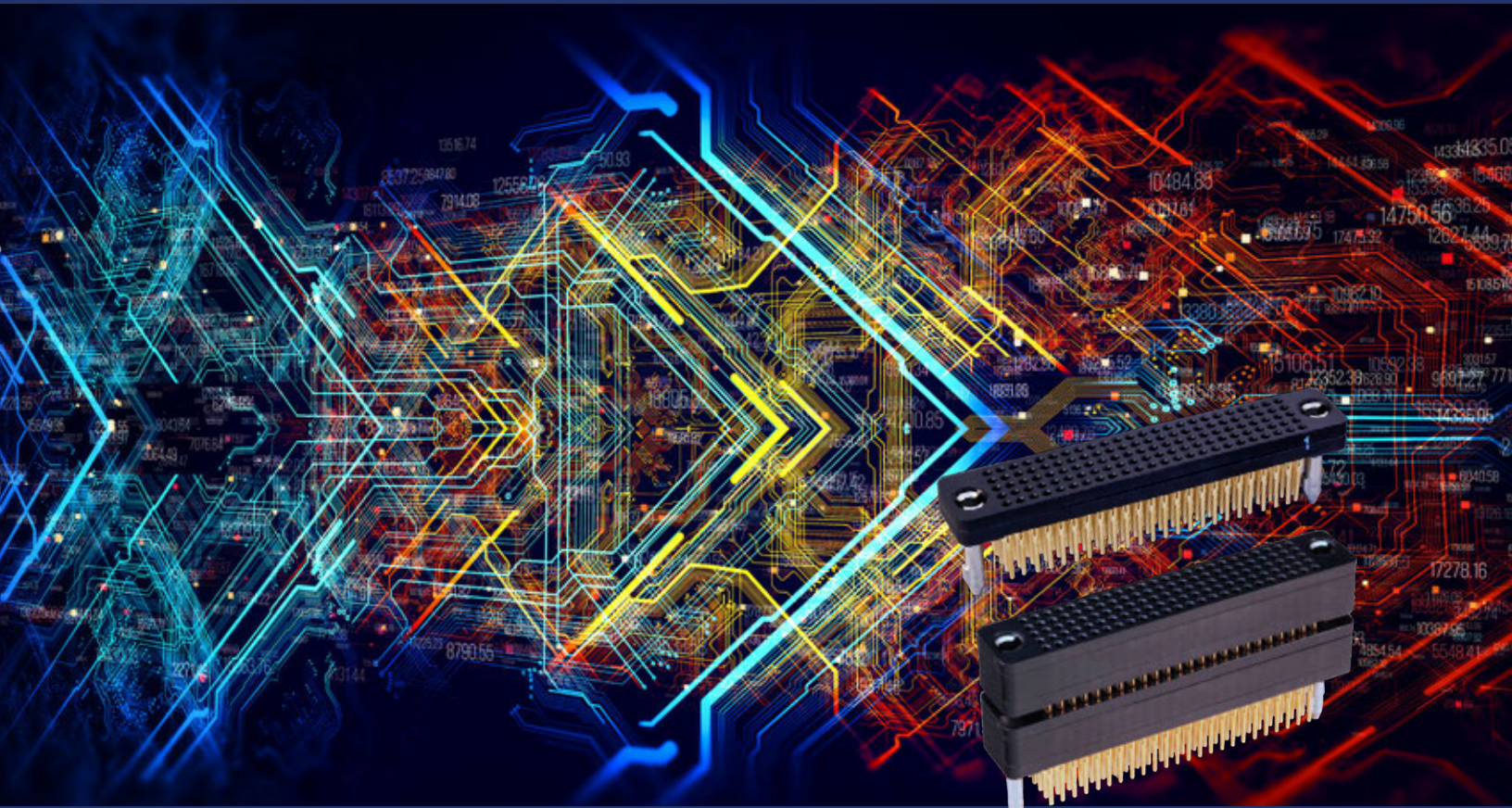
Series 962 BluMark RF 50 Ohm Coax Cables are available in seven size categories: 047, 086, 160, 200, 235, 300 and 450. These low attenuation cables are suitable for aerospace applications and test equipment. Jacket options include FEP and radiation-resistant space-grade ETFE. Triple-shielded high performance cables have expanded PTFE dielectric core for low loss up to 40 GHz.

- Low attenuation
- FEP and ETFE jackets
- Low Phase Change cables
- Seven size categories
- Compatible with standard RF/ Microwave connectors

COMPLETE
ECOSYSTEM
TOP, MIDDLE,
AND BOTTOM-OF-
STACK



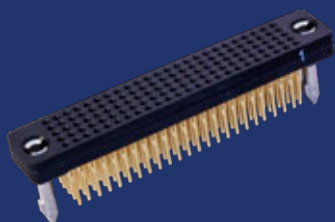
High-density, solder-free, compliant pin board-to-board stackable connectors



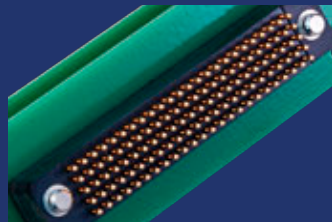
High-density, PCIe 3.0-ready board-to-board stackable connectors with solder-free compliant pin contacts.

- High-density .0625" pitch Chevron Contact System
- Performance up to 10.5Gbs
- Polarized insulator and hardware options
- High-temp PPS insulator meets NASA outgassing requirements
- Available wired / flex jumpers

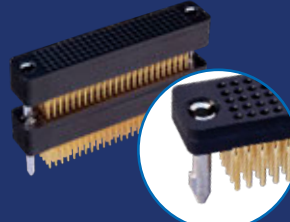
HD STACKER™ FOR MISSION-CRITICAL BOARD-TO-BOARD APPLICATIONS



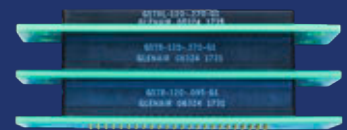
Solder-free press-fit (compliant pin) board mounting



.0625" pitch contact spacing: highest available density



Polarized shells and keyed guide pin hardware prevent mis-mating



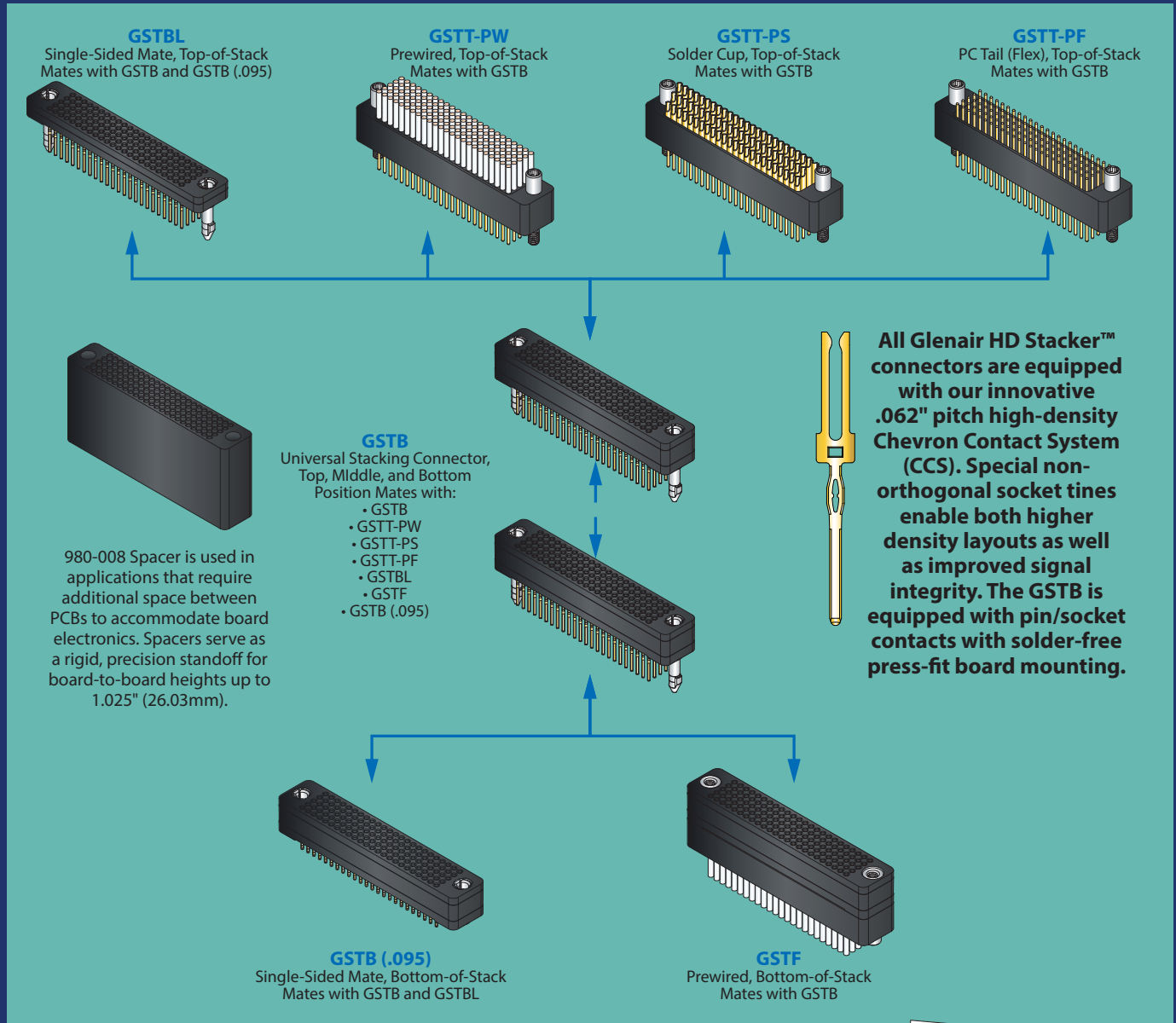
Controlled signal integrity for differential applications (PCIe Rev 3 capable)

.0625" PITCH "EYE OF THE NEEDLE" CONTACT High-Density Stacker™



Rugged board-to-board stackable connectors

HD STACKER™ POSITION AND MATING COMPATIBILITY GUIDE



QUALIFICATION TESTING / HIGH-SPEED PERFORMANCE

Stacker connectors were qualified in accordance with MIL-DTL-55302G testing for:

- Contact engagement/separation
- Contact retention
- DWV
- Electrical resistance
- Mechanical vibration and shock
- Insulation resistance
- Thermal shock
- Contact resistance
- Humidity

High-frequency electrical performance tests were performed for: Insertion loss, return loss, crosstalk, and time domain performance metrics including impedance and eye pattern. Complete test reports are available at www.glenair.com/test-reports-and-technical-information



MICRO-D
SUBMINIATURES
FLIGHT-GRADE
AND LAB-GRADE
SOLUTIONS



MIL-DTL-83513 and
Glenair Signature
Micro-D Connectors
and Splice-Free Cable
Assemblies

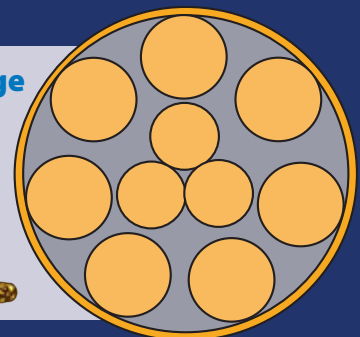


TwistPin equipped MIL-DTL-83513 Micro-D connectors and cables offer outstanding mating performance, durability, low contact resistance, and same-day availability

- High density TwistPin contacts on .050" centers
- Turnkey multibranch and complex cable assemblies
- 9 to 130 contact arrangements
- Single row, multi-row, low profile and high density insert arrangements
- QPL and commercial versions

The Micro TwistPin Advantage

Seven strands of TwistPin BeCu wire make direct contact with the machined socket, assuring low resistance, plenty of contact wipe, and superior shock and vibration performance.



Splice-free Micro-D and Nano
cable assemblies

MIL-DTL-83513 AND COMMERCIAL Micro-D Connectors



Mission-critical mating performance
industry-leading selection and availability

MATERIAL CLASSES AND QUALIFICATIONS



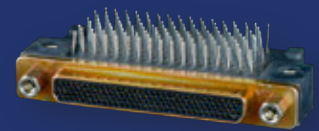
Environmental



Hermetic

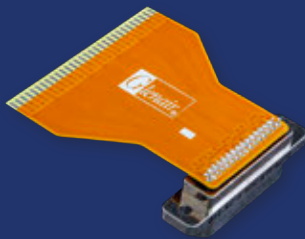


EMI / RFI Filter

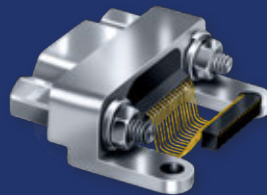


Space-Grade

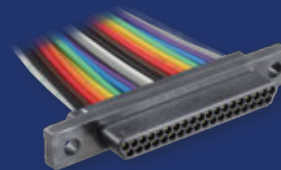
TERMINATION STYLES



Flex



PCB



Pigtail

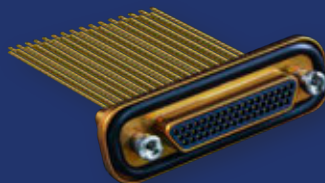


Solder

WIRED / CABLED CONFIGURATIONS



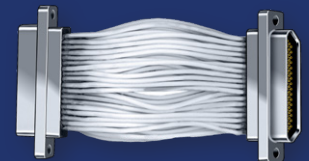
Shielded



Uninsulated



Insulated



Back-to-Back

PCB DESIGNS



Vertical



Horizontal



Surface-Mount



Shrouded

SPECIAL-PURPOSE DESIGNS



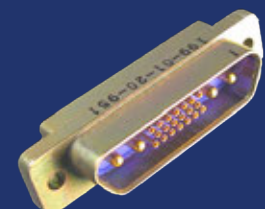
High-Temperature



Sav-Con®



Latching MicroStrip

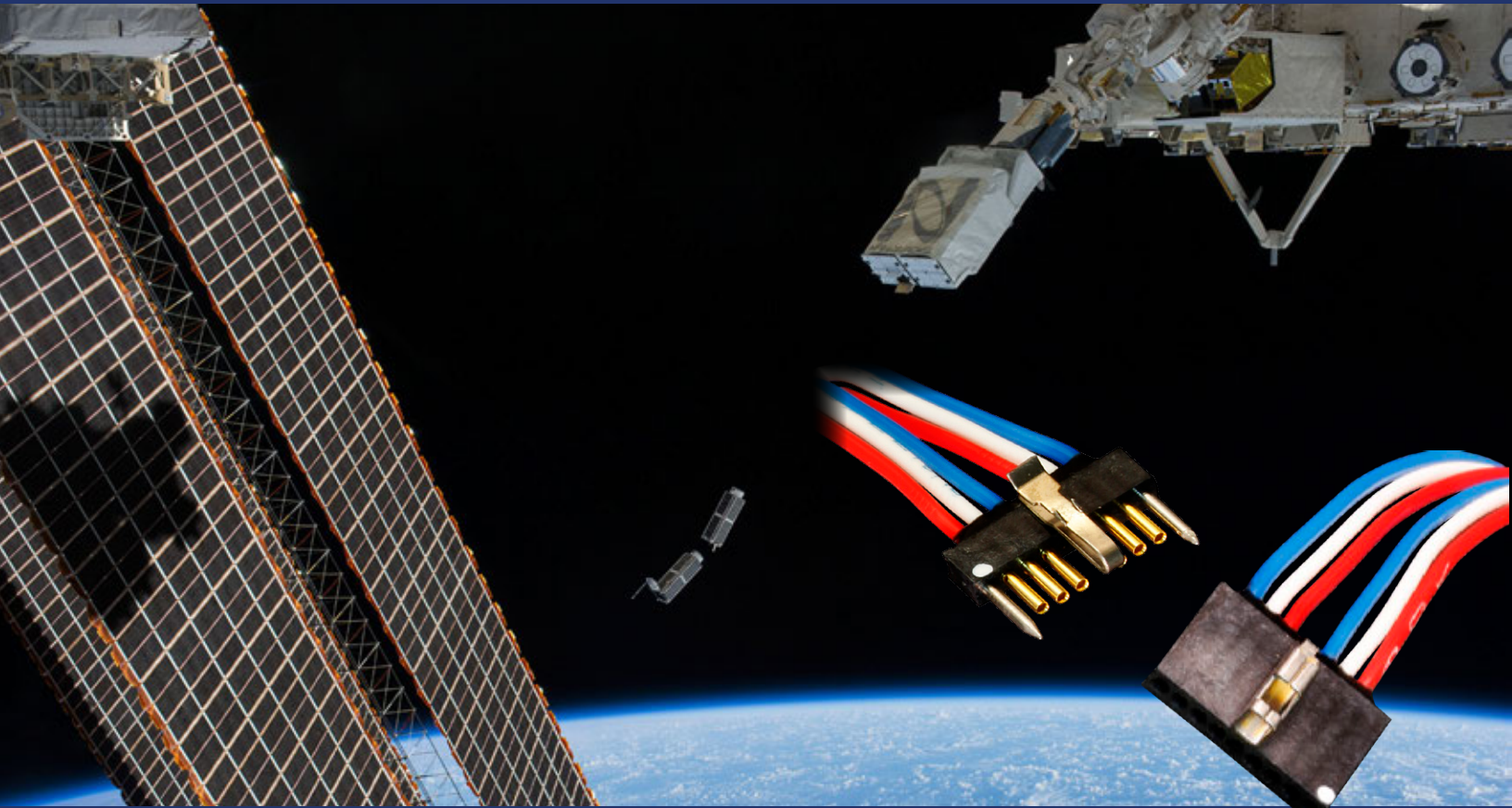


Combo

HIGH-DENSITY
STRIP
CONNECTORS
FOR 3 AMP SIGNAL
APPLICATIONS



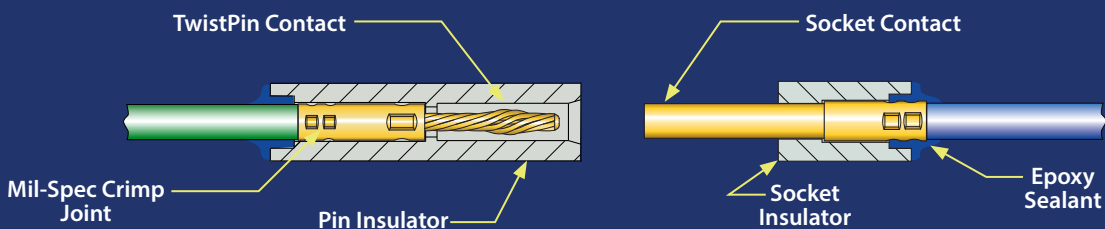
High-Reliability
Wire-to-Board
and Wire-to-Wire
MicroStrips



TwistPin performance and durability in an economical, space-saving single-row package IAW MIL-DTL-83513

- High-reliability TwistPin contact system
- #24-30 AWG wire size
- .050" pitch contact spacing
- Solder cup, pre-wired or PCB header terminations
- 3 Amps, -55 to +150C, 600 Vac

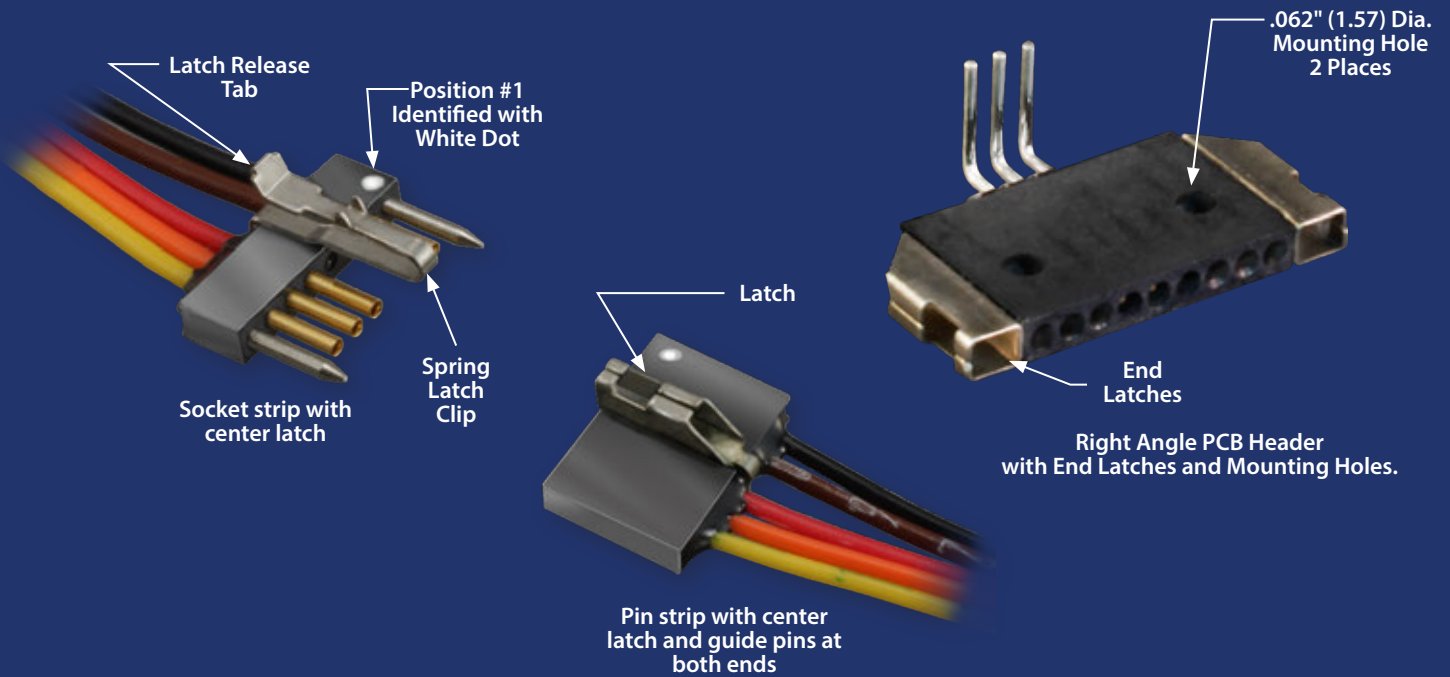
LATCHING MICROSTRIP CROSS-SECTIONAL VIEW





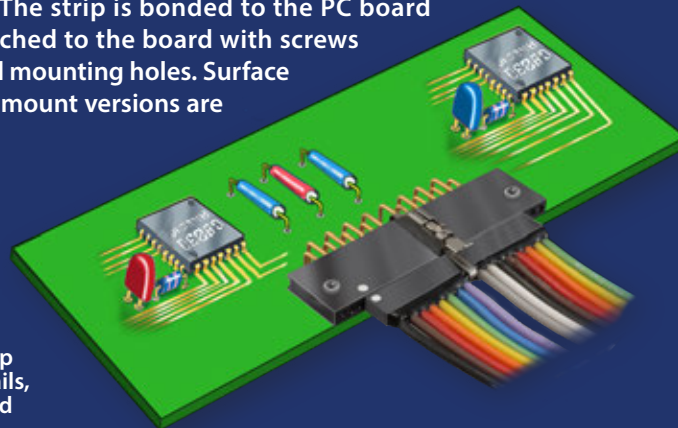
ABOUT SPRING LATCHES, GUIDE PINS AND MOUNTING HOLES

Optional stainless steel latch clips provide secure mating when subjected to shock and vibration. A single center latch is suitable for most applications. Dual end latches are also available. The spring latch is always installed on the socket strip. The latch receiver is installed on the pin strip. To unmate the connectors, simply press the release tab while pulling the connectors apart. MicroStrips are available with stainless steel guide pins. A single guide pin provides circuit polarization. A guide pin on each end helps to align connectors when mating and prevents damage to contacts. For most applications the preferred configuration is a single center latch with no guide pins. Mounting holes are now available. Attach strips to circuit boards with size 0-80 screws (customer-supplied).



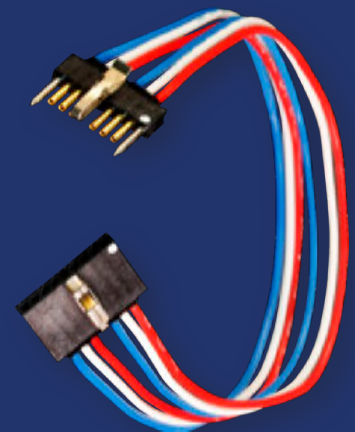
ABOUT BOARD MOUNT STRIPS

Space customers typically use MicroStrips for high reliability board-to-wire I/O applications. The pin strip is usually configured with right angle thru-hole PC tails. The strip is bonded to the PC board with epoxy, or attached to the board with screws installed in optional mounting holes. Surface mount and vertical mount versions are also available.



Right angle pin strip with staggered PC tails, mounting holes and center latch

SINGLE ROW BACK-TO-BACK MICROSTRIPS



.050" pitch single row surface mount back-to-back microstrip

NANO CONNECTORS
CIRCULAR AND
RECTANGULAR
CONFIGURATIONS



MIL-DTL-32139 QPL and Glenair Signature
Nano miniature connector designs



MIL★STAR
HIGH-PERFORMANCE HOOKUP WIRE AND CABLE

Turnkey solutions from
shielded cable assemblies
to discrete wire-to-board
interconnects

The M32139 Nano is the smallest and lightest mil-spec connector in the business. 1 Amp contacts are set on .025" centers and terminated to 30 AWG wire or PCB tails. Glenair supplies both standard QPL designs as well as a broader range of signature offerings.

- Single and double row
- Metal shell, aluminum, titanium or stainless steel
- TwistPin contact system
- Gold alloy contact, unplated
- Thru-hole and surface-mount PCB versions

THE NANO TWISTPIN ADVANTAGE



Transverse cross-section of a TwistPin contact crimped to solid wire



- Gas-Tight Crimp Joint
- Better Shock and Vibration Performance
- Corrosion Proof Contact Alloy



SERIES 89

Nano miniature Connectors



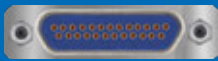
Nano high density · single- and dual-row · cable and PCB

Series 89 Nano miniature Connector Performance	
Contact Spacing	.025" (0.64mm) Contact Centers
Wire Accommodation	#30-#32 AWG
Current Rating	1 AMP Max
DWV	250 VAC RMS Sea Level
Insulation Resistance	5000 Megohms Minimum
Operating Temperature	-55° C. to +125° C.
Contact Resistance	71 Millivolt Drop Maximum
Shock, Vibration	100g's, 20 g's
Durability	200 Mating Cycles
Corrosion Resistance	48 Hours Salt Spray
Mating Force	5 Ounce Max, 0.4 Ounce Min

HOW SMALL ARE THEY?



D-Subminiature Connector
25 Contacts
on 0.109 Inch Spacing



Micro-D Connector
25 Contacts
on 0.050 Inch Spacing



Nano Connector
25 Contacts
on 0.025 Inch Spacing

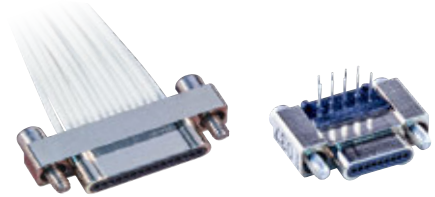


Also available: aerospace-grade Nano circulars

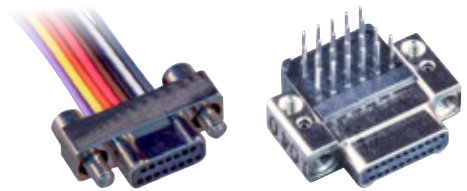
Nano Circular Connectors and Accessories



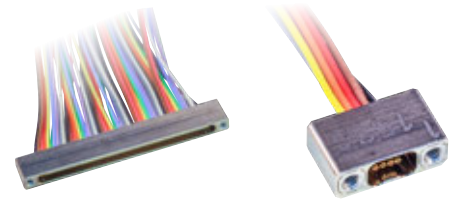
Nano Rectangular Single-Row Connectors and Accessories



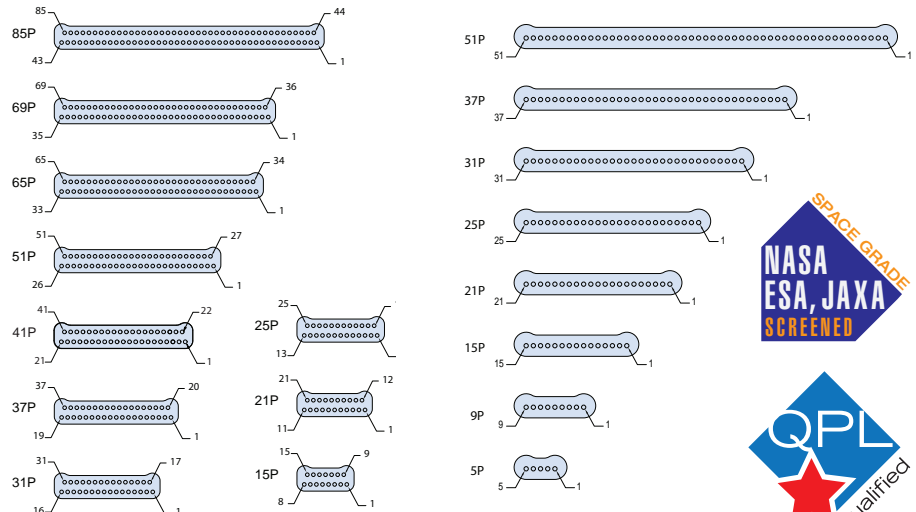
Nano Rectangular Dual-Row Connectors and Accessories



MIL-DTL-32139 Qualified Connectors and Accessories



NANO MINIATURE CONTACT ARRANGEMENTS



COMPOSITE AND
THIN-WALL
ALUMINUM
REDUCED WEIGHT
BACKSHELLS



EMI Shield Termination
Backshells for Satellite
Wire Harnesses



Space-Grade Shrink Boots
GTS 4123: heat-shrinkable
fluoropolymer alloy shrink boots
for operating temperature range
-50°C to 175°C

Circular and rectangular backshells and connector accessories: corrosion resistance, weight reduction, environmental durability and design innovation



The Glenair Qwik-Clamp connector accessories shown here are used on the International Space Station. The gold plated circular part is extremely resistant to space corrosion and radiation. Both styles are designed with smooth surfaces to eliminate potential damage to space suits.

- High-performance connector accessories for every environmental, mechanical and electromagnetic shielding requirements
- NASA, ESA, and JAXA screened and qualified to AS85049, SSQ 21635, 21636, 22698 and 22681 and other standards
- Modern designs for bus applications, line cards, instrument panels, and non-circular bundles
- Lightweight composite materials available
- Removable-entry solutions with split shells and integrated banding platforms

SPACE-GRADE INNOVATIONS

Circular and rectangular backshells and connector accessories



COMPOSITE DESIGN INNOVATION RADICALLY REDUCES INTERCONNECT SYSTEM WEIGHT



Band-in-a-Can backshell



Swing-Arm with banding insert

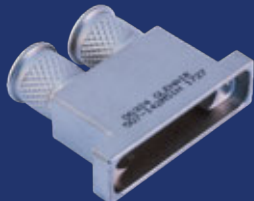


Mighty Mouse composite

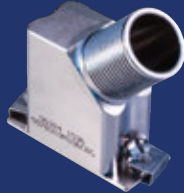


Isolated conductive ground path

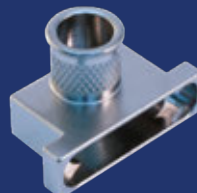
SPACE-GRADE MICRO-D AND D-SUBMINIATURE BACKSHELLS AND ACCESSORY HARDWARE



Single, dual, and triple entry



Angled entry



Side entry

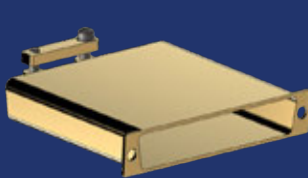


Elliptical entry



Composite split shell

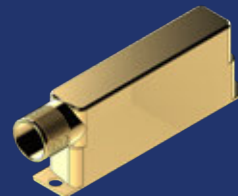
ESCC TYPE FOR MIL-DTL-24308 D-SUB ESA APPLICATIONS IAW ESCC 3401/072



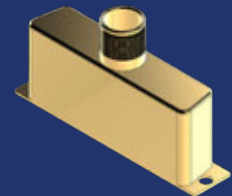
Strain Relief IAW ESCC 3401/072, Type Variants 05, 06, 07, 08, 09, and 72



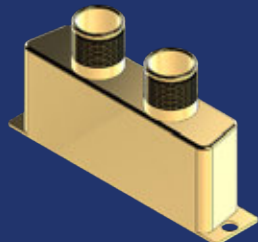
Shorting Cans IAW ESCC 3401/072, Type Variants 10, 11, 12, 13, 14, 73 / 61, 62, 63, 64, 65, 80



90° EMI/RFI Banding Backshell IAW ESCC 3401/072, Type Variants 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, and 76



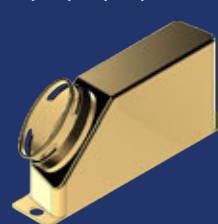
Straight EMI/RFI Banding IAW ESCC 3401/072, Type Variants 35, 36, 37, 38, 39 and 77



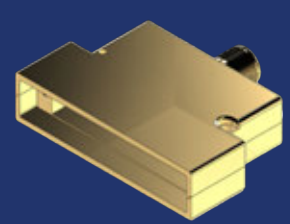
Dual Entry IAW ESCC 3401/072, 40 Type Variant



Elliptical Entry IAW ESCC3401/072, Type Variants 46, 47, 48, 49, 50, and 78



45° Elliptical IAW ESCC3401/072, Type Variants 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, and 79

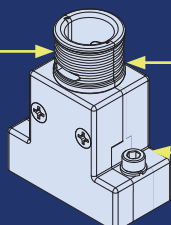


Straight IAW ESCC 3401/072, Type Variants 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 74, and 75

REMOVABLE-ENTRY AND CABLE CLAMP BACKSHELLS: 557-625 AND 557-653

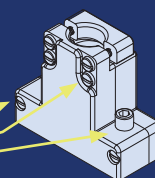
Removable round cable entry banding version

Removable entry with anti-rotation feature remains captive during assembly



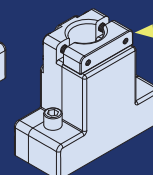
Tongue-and-groove split-shell design for superior EMC performance and ease-of-assembly

All captive hardware—no FOD—even when backshell is split



Cable clamp version

Ultra low-profile cable clamp design



WEIGHT - SAVING
LIGHTWEIGHT
CABLE AND
CONDUIT
SHIELDING

ARMORLITE™

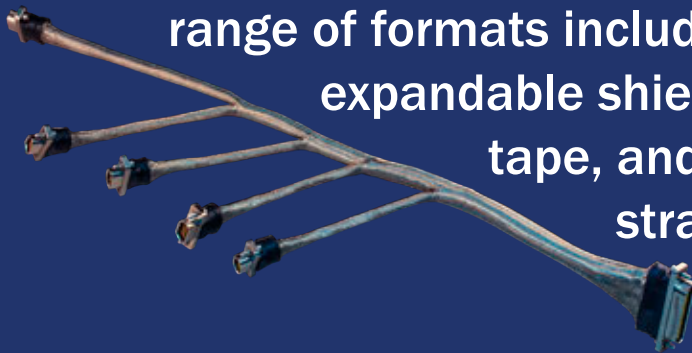
Microfilament nickel-clad flexible stainless steel EMI/RFI braided shields and ESD bonds



Overbraided conduit assemblies for flight applications (above) and launch vehicle applications (left)

ArmorLite™ is an expandable, flexible, high-strength, conductive stainless-steel microfilament braid material designed for use as EMI/RFI shielding in high-performance wire interconnect systems. ArmorLite™ is packaged in a wide range of formats including bulk expandable shielding, mesh tape, and ESD bond straps.

- Ultra-lightweight EMI/RFI overbraiding for EMC and solar radiation applications
- Microfilament stainless steel: 70% lighter than NiCu A-A-59569/QQB575
- Lightweight, flexible ESD bond straps
- New ArmorLite™ CF with configuration with enhanced temperature tolerance
- Superior flexibility and “windowing” resistance: 90 to 95% optical coverage
- 70,000 psi (min.) tensile strength
- Flight-grade solution with proven TRL 9 performance



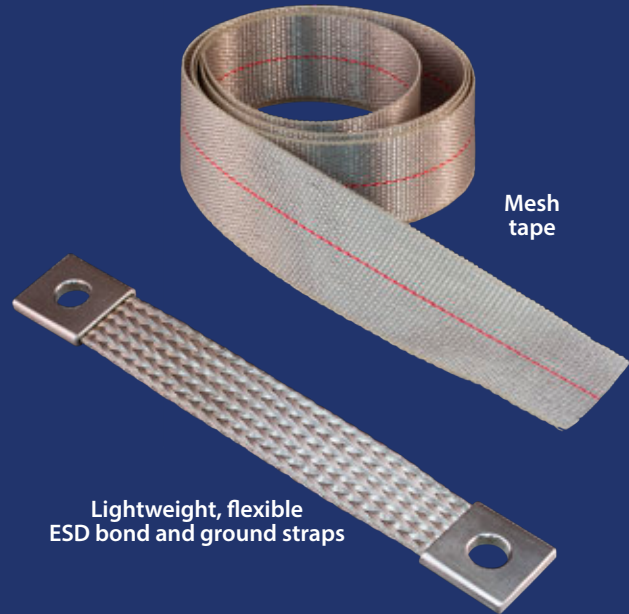
LIGHTWEIGHT, FLEXIBLE
ArmorLite™ Microfilament Braid
 for EMI/RFI Shielding and Bonding Applications



ARMORLITE™ SHIELDING SOLUTIONS AND PACKAGING



Factory overbraided

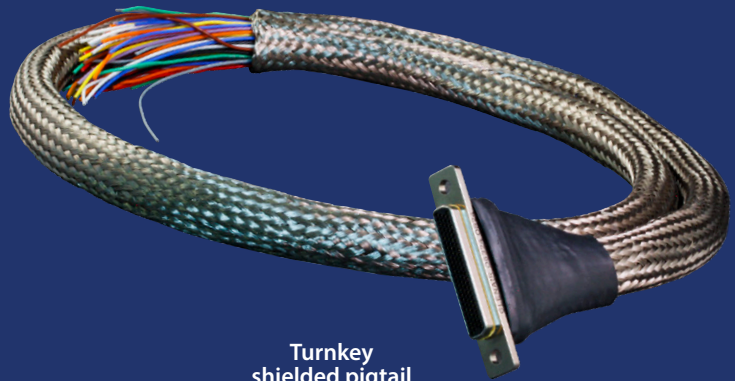


Mesh tape

Lightweight, flexible ESD bond and ground straps



Integrated shield sock



Turnkey shielded pigtail

ALSO AVAILABLE FOR ADDITIONAL WEIGHT SAVINGS: AMBERSTRAND METAL-CLAD COMPOSITE BRAIDED SHIELDING



AmberStrand® 100% vs. nickel-coated copper			
Braid Dia.	AmberStrand® 100% 103-026	Nickel-Copper 100-003	% Weight Savings/ Foot
.062	.6	1.9	68%
.125	1.0	4.8	79%
.250	1.8	16.1	88%
.375	2.3	18.5	87%
.500	3.7	22.3	83%
.625	4.4	27.7	84%
.750	5.2	34.3	85%
1.000	8.0	35.0	77%

AmberStrand® 75% vs. nickel-coated copper			
Braid Dia.	AmberStrand® 75/25% NiCu 103-027	Nickel-Copper 100-003	% Weight Savings/ Foot
.062	.9	1.9	52%
.125	1.5	4.8	68%
.250	2.4	16.1	85%
.375	3.9	18.5	79%
.500	5.4	22.3	76%
.625	6.4	27.7	77%
.750	7.2	34.3	79%
1.000	11.0	35.0	69%



Reference Applications

Brief history of Glenair space-grade design-ins



Atmospheric Infrared Sounder (AIRS)

Glenair-built cables provide signal and power interconnection on a broad range of space applications including The **Atmospheric Infrared Sounder (AIRS)** instrument aboard the Aqua Earth-observing satellite, JPL Mars Probes, the Space Shuttle, and the AIRS satellite. Several notable space applications include:

The **Gravity Probe**, confirmed two key predictions of Einstein's general theory of relativity in 2011 by monitoring the orientations of ultra-sensitive gyroscopes relative to a distant guide star. Glenair-built cables are on board.



Gravity Probe

Titan II space-launch vehicles, with Glenair-made interconnect harnesses, propelled all twelve manned Gemini capsules.

Hermetic connectors are ideal for high-pressure/low-leakage applications in air, sea and space environments. Made of stainless steel (CRES) with glass insulators fused to the connector shell, and suitable contacts meeting a leak rate of 1×10^{-6} cubic centimeters of Helium per second, these mounted receptacle connectors and bulkhead feed thrus prevent gases from travelling through apertures or penetrations created for the routing of interconnect cabling. Glenair hermetics have protected a range of space programs including:

The **X-38** program implemented to design and build a spacecraft capable of flying itself and the Space Station crew back to Earth in an orbital emergency.



The X-38

Pegasus rockets, the winged space booster vehicles used in an expendable launch system developed by private industry.

MetOp-A, Europe's polar-orbiting satellite dedicated to operational meteorology.



MetOp-A

A well designed interconnect system will include a complement of grounding and shielding technologies to insure EMC. **EMI filter connectors** are an effective method to achieve electro-magnetic compatibility. Glenair is extremely well versed in supplying filter connector products optimized for use in space-grade applications, providing products compliant to EEE-INST-002, Table 2G, the recognized standard for space grade filters. Glenair MIL-DTL-38999, Series 80 Mighty Mouse, Series 28 HiPer-D, and Series 79 Micro-Crimp filter connectors are currently qualified and used by Ball Aerospace, Boeing Space, NASA/JPL, Orbital Sciences, Sierra Nevada Corp., and others. Notable Glenair Filtered connector space applications include:

Skynet, for the United Kingdom Ministry of Defence, to provide strategic communication services to the three branches of the British Armed Forces and to NATO forces engaged on coalition tasks.

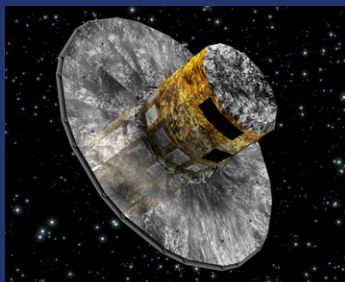


Skynet

The **James Webb Space Telescope (JWST)** is a large, infrared-optimized space telescope. Launched in 2021, JWST is designed to find the first galaxies that formed in the early Universe, connecting the Big Bang to our own Milky Way Galaxy.

Micro-D connectors, including environmentals, hermetics, filters, and flex assemblies are commonly used in space applications for their high-performance and small size. The precision-machined shell of the Micro-D, with its robust mating retention forces, makes for an ideal connector for rocket and space vehicle applications that are subject to high levels of vibration and shock. The Micro-D is easily customized with package and mounting modification to fit virtually any integration challenge. A short list of Glenair Micro-D space applications would include the James Webb Space Telescope, SkyNet 5 military satellite, ALMA space telescope, JPL Mars Probe, Mars Curiosity and Perseverance Rovers, AIRS satellite, and others. Several notable space applications that use Glenair Micro-D connectors include:

The **Herschel Space Observatory**, from the European Space Agency, made several scientific discoveries in its operational phase from 2009 – 2013, including a previously unknown and unexpected step in the star formation process, and the presence of molecular oxygen in space.



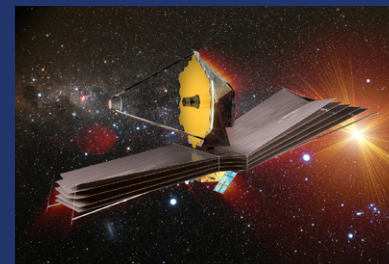
Gaia satellite

The European Space Agency also developed and built the **Gaia** satellite. Launched in 2013, its mission is to construct the largest and most precise map to date of the Milky Way. Its 2016 data release included positions and magnitudes for 1.1 billion stars

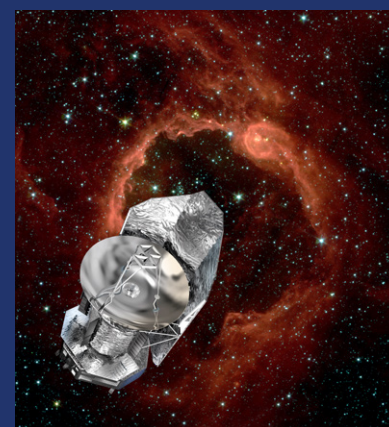
Cassini-Huygens was a joint NASA/ESA/ASI robotic spacecraft mission studying Saturn and its moons. Cassini executed several risky passes through Saturn's inner rings before completing its mission by burning up in atmospheric entry—but the data it returned will be analyzed for years to come.

CrIS is an advanced atmospheric sounding instrument aboard the United States Suomi National Polar Partnership (NPP) Polar-orbiting Operational Environmental Satellite. It produces high-resolution pressure, temperature, and moisture profiles from space, enabling more accurate predictions of severe weather events.

Glenair M32139 Class S Nanominiature connectors are DSCC approved for space programs. Glenair Nanominiature connectors, cable assemblies and flex circuit assemblies are currently in use on the several space-based telescopes, including the **Large Synoptic Survey Telescope (LSST)**, **James Webb Space Telescope**, and others.



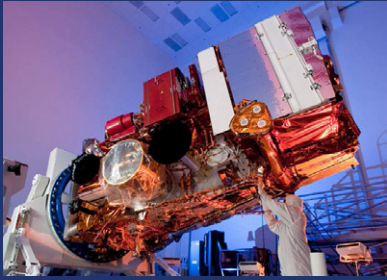
JWST



Herschel Space Observatory



Cassini-Huygens

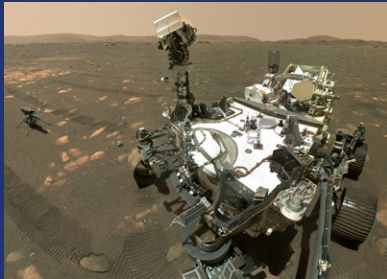


CrIS NPOESS Satellite

The **Series 79** connector is a Glenair original design. It features crimp, rear-release size #23 contacts on 0.075" spacing, as well as size #12 and #16 power and coaxial crimp contacts available in 29 insert arrangements for data and power transmission. The Series 79 Micro-Crimp is ideally suited for blind-mate rack and panel and/or module-to-chassis applications; and is currently qualified for use by Orion, Ball Aerospace, Honeywell Space, and LMCO Denver.

Glenair **Series 80 Mighty Mouse** connector and cable assemblies were developed as a smaller and lighter alternative to MIL-DTL-38999, offering virtually equal performance with up to 71% (weight) and 52% (size) savings for similar contact layouts. Mighty Mouse is well established in hundreds of safety-critical military, medical, industrial and geo-physical and space applications. Some space applications for this reduced form factor connector include:

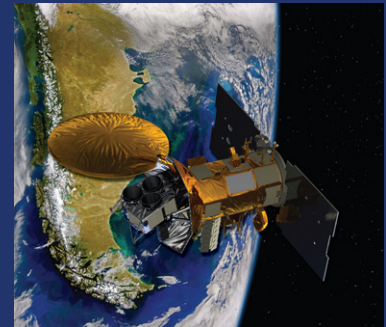
NASA's **Mars Exploration, Curiosity, and Perseverance Rovers**, ongoing robotic missions to explore the Martian surface and geology. The Perseverance rover marked its 2nd year of exploration in 2024 having collected 18 Martian samples, traveled over 9 miles, and transmitted over 200,000 images.



Mars Perseverance Rover looks at the Ingenuity helicopter, August 2022

The Mars Science Laboratory **Curiosity** landed in Mars' Gale Crater in 2012. This rover is over five times as heavy and carries over ten times the weight in scientific instruments as previous rovers. Within weeks, Curiosity discovered an ancient streambed where water once flowed, and evidence of a lake that could have supported microbial life in the distant past. Curiosity's original 2-year mission has been extended indefinitely, and it's still returning valuable data more than 10 years after landing.

Aquarius was a satellite mission to measure global Sea Surface Salinity. It provided the global view of salinity variability needed for climate studies.



Aquarius Satellite

Glenair **Sav-Con® Connector Savers** protect deliverable connectors subject to repeated mating and unmating cycles, especially from repetitive qualification test cycles. Sav-Con® Connector Savers prevent costly repair or replacement of cable plugs and receptacle connectors by absorbing connect and disconnect abuse and by reducing mating cycles during testing to the absolute minimum.

A virtual "Who's Who" of space programs use Glenair Sav-Cons including Boeing Satellite Systems, the Delta IV launch vehicle, Voyager, Galileo, Magellan, Cassini, and others—both during fabrication testing and in operation.

One of the most dramatic applications of our Sav-Con connectors is on the **Space Shuttle Orbiter** where they provided protection for the umbilical connectors from liftoff to touchdown on every mission.



A NASA LEO (Low Earth Orbit) Satellite

For many space applications, the cable shield is the most important element in controlling EMI and radiation damage. Unfortunately, metal shielding—especially when applied in multiple layers—can be extremely heavy. **AmberStrand** composite thermoplastic braid, and **ArmorLite** microfilament stainless steel braid provide robust EMI shielding at a fraction of the weight of conventional shielding. Glenair lightweight braid technologies are currently qualified for use by EADS Astrium, Honeywell Space, Orbital Sciences, and Ball Aerospace. Glenair lightweight EMI/RFI braided shielding notably served on:

The **Cassini-Huygens** Program, an international science mission to the Saturnian system.

Mars Pathfinder, which delivered an instrumented lander and a free-ranging robotic rover to the surface of the red planet.



The International Space Station (ISS)

The Glenair **Qwik-Clamp backshell** is used on the **International Space Station**. This gold plated part is extremely resistant to space corrosion and radiation and is designed with all smooth surfaces to eliminate potential damage to space suits.

Other circular backshell and connector accessory space applications include:

The European Space Agency's **Ariane 5**, which launches satellites and other craft into geostationary transfer orbit (GTO), medium and low Earth orbits, Sun-synchronous orbits (SSO) and Earth-escape trajectories

SEA Launch was a spacecraft launch service using a mobile sea platform for equatorial launches of commercial payloads. Glenair rectangular accessories are used on this and dozens of space programs including the International Space Station, MetOps, Herschel Space Observatory, James Webb telescope, and others.

The Glenair **Series 28 HiPer-D** High-Performance MIL-24308 Intermateable and qualified MIL-DTL-24308 Class K space-grade hermetic connectors have become the go-to standard for mission-critical space applications and are now qualified for use by Ball Aerospace, LMCO Denver, Orbital Sciences, and others.

Complete Interconnect System Designs

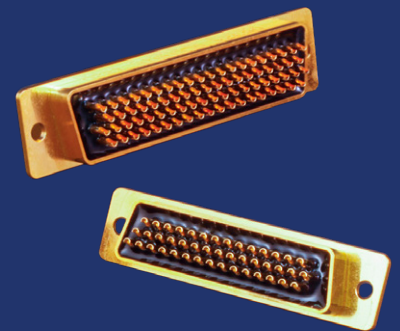
Glenair is the exclusive interconnect connector and cable supplier to the **Sierra Nevada Dream Chaser** reusable crewed suborbital and orbital space plane for Micro-D connectors, EMI filters, flex circuitry, lightweight microfilament braid, metal and composite backshells, and other technologies.

Hold-Down and Release Mechanism (HDRM) Flight Heritage

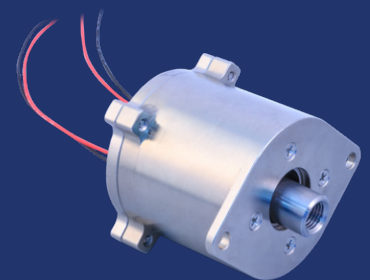
Glenair heavy-duty HDRMs were ESA-qualified for use on the **Euclid mission** to study dark matter and energy in deep space. Launched aboard a SpaceX Falcon 9 in 2023, the Euclid space telescope was deployed successfully by the Glenair HDRM device. The JAXA **Smart Lander for Investigating the Moon (SLIM)** is a small-scale exploration lander, again successfully deployed with Glenair non-pyrotechnic HDRM technology.



Space-grade Qwik-Clamp backshell designed for the International Space Station



Gold-plated space-grade Series 28 HiPer-D connectors



Glenair Heavy-Duty non-pyrotechnic HDRM



JAXA Smart Lander for Investigating Moon (SLIM)

GLENAIR GLENDALE:
Complete vertical integration
of manufacturing resources—
at home in Southern California
since 1956

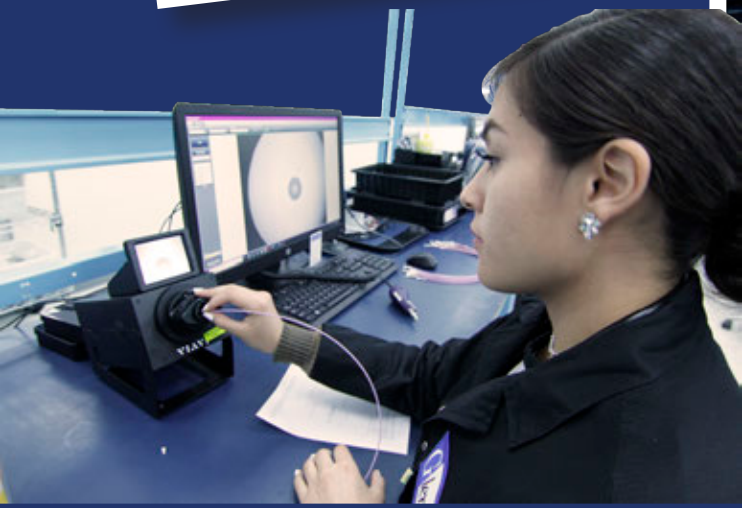


Glenair operates the largest high-reliability interconnect manufacturing operation in the United States, allowing us to fully support our broad range of land, sea, air, and space customers.





Glenair SoCal's most important asset: highly technical staff, fully empowered with all the right facilities and operation resources.





SAME-DAY SHIPMENT STOCKING

Immediate availability for high-demand connectors and tooling.



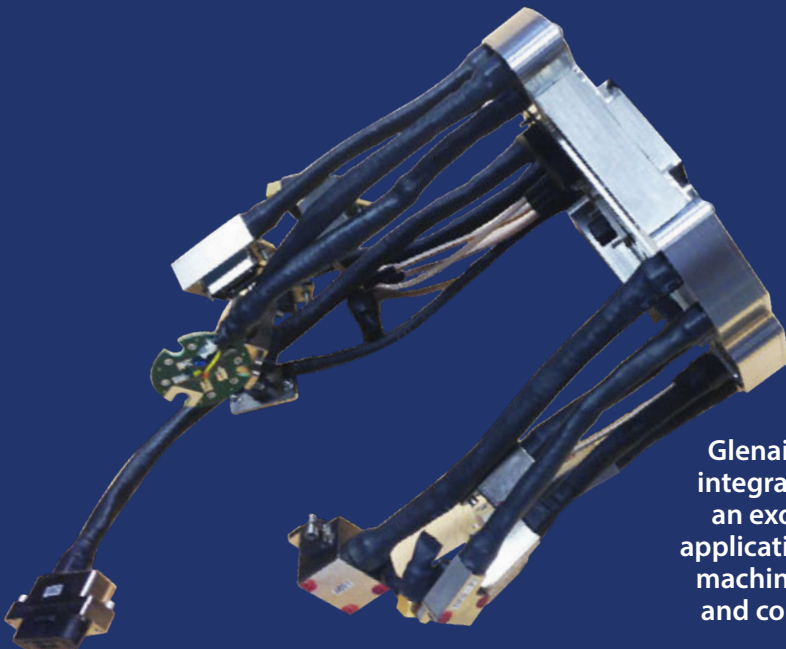
HARNESS ASSEMBLIES

for Micro-D, Nanominiature, and fiber optic connectors and cable assemblies.



IN-HOUSE TESTING CAPABILITIES

Glenair UK operates an independently accredited BS9000:CECC:IECQ test lab for internal and third-party product development / design verification and connector qualification including pure air standards.



Glenair UK complex integrated system for an exoatmospheric application with custom machined connectors and complex cabling





GLENAIR UK:
Mission-critical connectors
and assemblies for UK and
European markets with
a special focus on micro
and nanominiature flexi
assemblies

GLENAIR ITALIA:
Manufacturing harsh-environment military, nuclear, and aerospace interconnect technologies for power, high-speed Ethernet, and hermetic seal applications.



HIGH-CAPACITY CNC MACHINING CENTERS allow Glenair BLQ to provide lightning-fast turnaround on small and custom orders as well as large production runs, all with superior surface finishes and better part quality.



ADVANCED HERMETIC SEAL AND CONNECTOR PLATING CAPABILITIES
Space-compliant gold and nickel plating performed in-house. Hermetic seal connector fabrication with performance levels to 1×10^{-7} helium leak rates.



TOTAL VERTICAL INTEGRATION
includes In-house rubber and thermoplastic injection molding.



IN-HOUSE TEST LAB
with capabilities for both high-voltage as well as high-speed signal product qualification. Credentials include ISO 17025 and others.

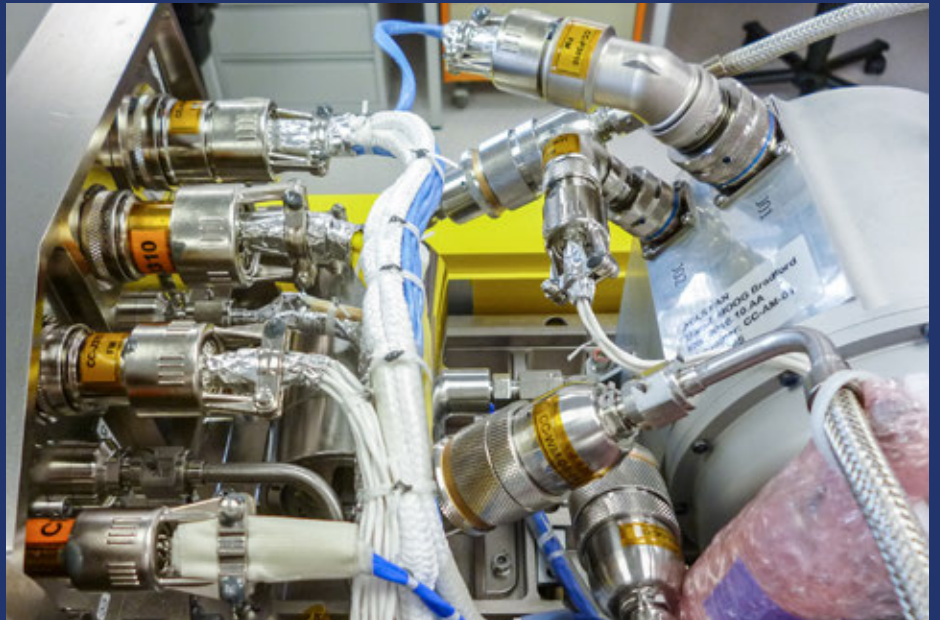


GLENAIR SALEM:

Our space systems business unit in Salem, Germany includes a 600 m² production floor, 300 m² ISO 8 and ISO 6 clean rooms, an ISO 5 flow chamber (certified to ESD Standard 61340-5-1), with ample accommodation for large mock-up and integration projects.



CLEAN ROOM ASSEMBLY
with both environmental
filtering and electrostatic
discharge protection.



SPACE-GRADE HARNESS FABRICATION AND INTEGRATION
In-house or at customer facility.



ELECTRO-MECHANICAL
Fabrication of space-grade
interconnect technologies
including HDRM (release nut)
mechanisms.



MISSION-CRITICAL INTERCONNECT SOLUTIONS

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