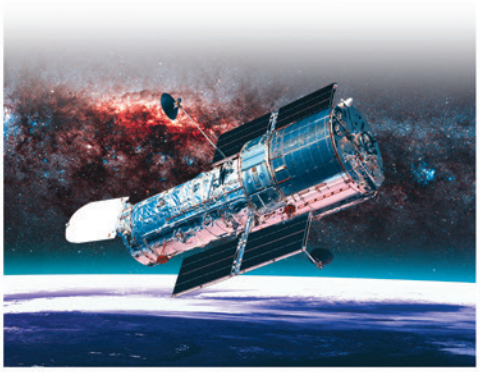
AirBorn

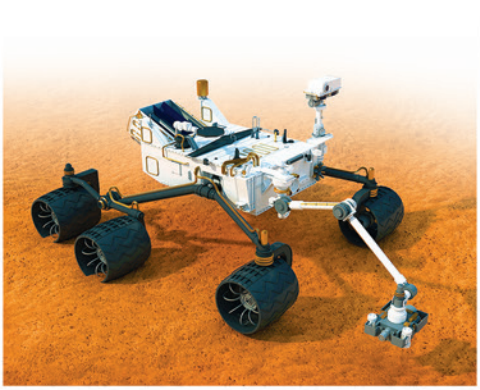
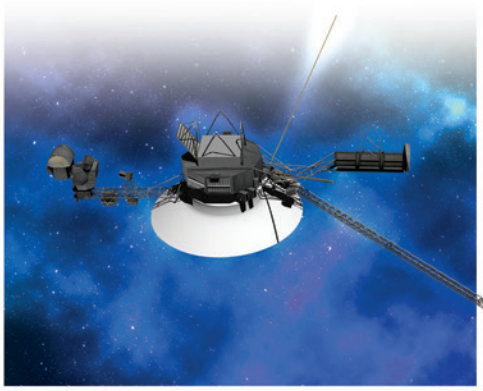
Bringing Your Innovations To Life

Space-Rated Interconnects

& Value-Added Services

AirBorn components have over 4 decades of spaceflight heritage.


Engineering & Manufacturing Electronic Component Solutions Since 1958

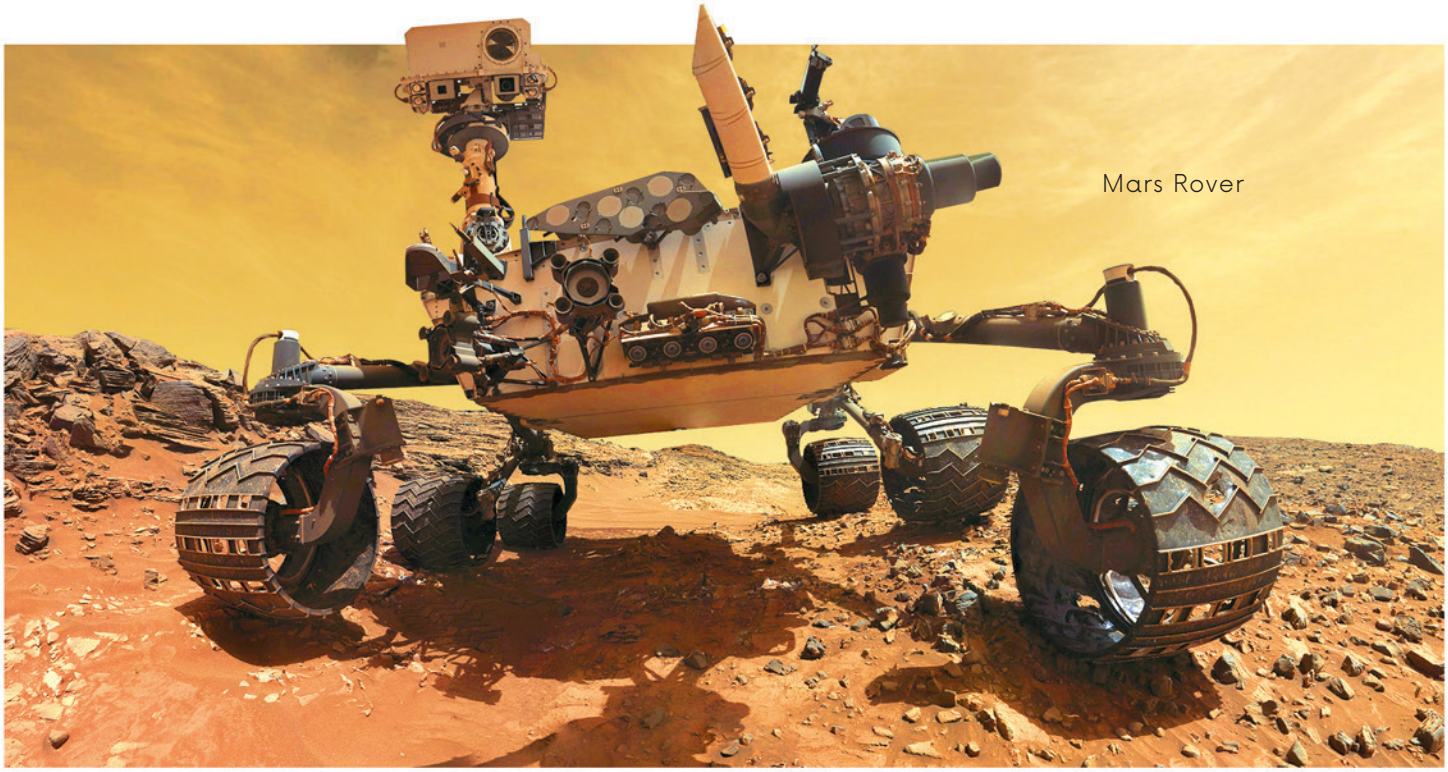
AirBorn is an employee owned company whose core business is engineering & manufacturing specialized connectors & electronic components for OEMs worldwide. We serve customers across many industries including: Commercial Air, Industrial, Medical, Military/Defense & Space Exploration.

AirBorn components are a part of many historical space applications. Beginning with the ***Apollo missions*** and extending into the ***Voyager I & II*** space vehicles, ***Space Shuttles***, ***International Space Station***, ***Hubble Telescope***, ***Mars Rovers*** and innumerable Earth-orbiting satellites. Customers trust AirBorn products and have since our inception in 1958.

From deep sea to deep space, our innovative interconnect, value add & box build solutions are chosen by leading companies in space exploration to operate their most critical systems, in the most hostile environments.

AirBorn

3500 AirBorn Circle — Georgetown, TX 78626 • p. 512.863.5585



Mars Rover

Rugged & Reliable Interconnects

AirBorn's W-Series, R-Series, M-Series & N-Series connector families have all been launched aboard vehicles into the vastness of space — but the list won't end there. Our high-speed verSI family, ideal for high-vibration signal integrity applications, is being designed into future missions as is our Series 360* circular interconnect family.

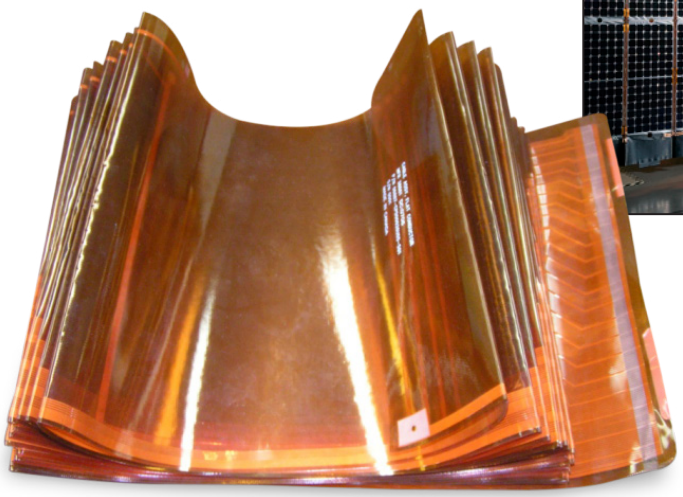
Key features and materials used in our interconnect design which make them ideal for the severities of space exploration include:

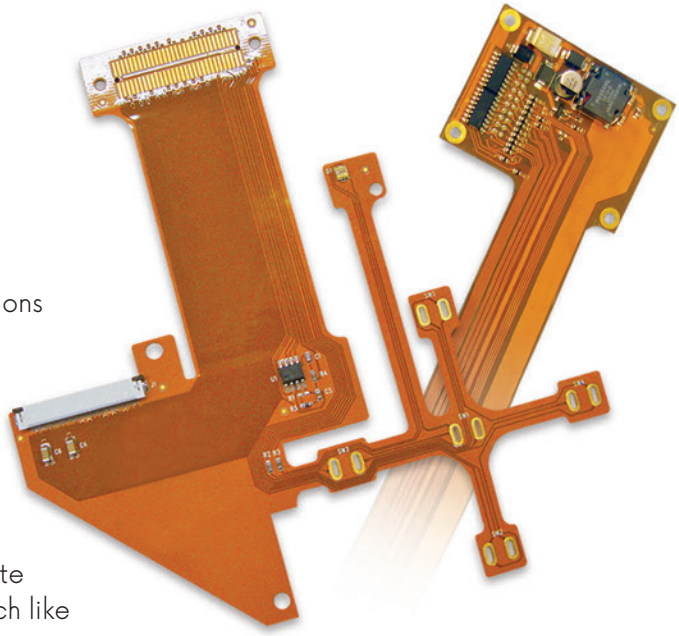
- All assemblies meet NASA's out-gassing specifications
- Pure tin is never used in assemblies destined for space applications
- Ruggedized, multi-point contacts for extreme environments

Our interconnects are designed to withstand the rigors of not only space flight but launching, landing and operating in worlds beyond our own.

*Series 360 connectors are currently available in North America only.

Multi-Mission Modular Solar Array





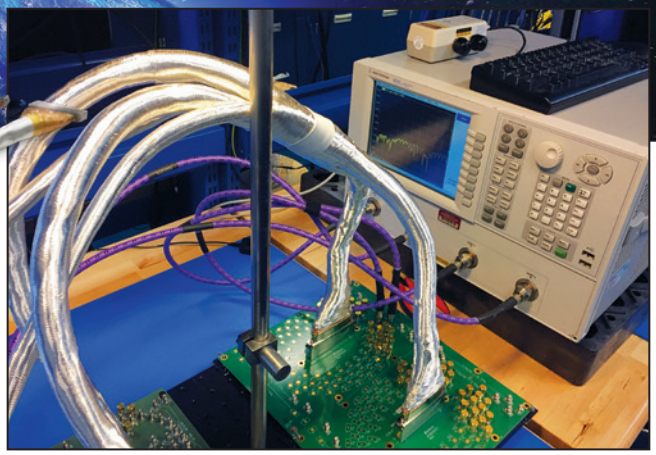
Flexible Circuit Assemblies

AirBorn manufactures flexible circuit assemblies for many applications but it's particularly useful where product weight and intricate 3D routing is a design concern, such as within space vehicles.

For Lockheed Martin, we manufactured flexible cable assemblies exceeding 63 feet in length for their Multi-mission Modular Solar Array (MMSA). Array thickness was reduced from .75" - 1" in a typical rigid panel down to 0.002" thick in the MMSA. This new design is a component of Lockheed Martin's LM2100 satellite bus program, created to harness the unlimited power of the sun, much like the solar arrays on the International Space Station.

3500 AirBorn Circle — Georgetown, TX 78626 • p. 512.863.5585

Custom verSI & microSI Cable Assemblies



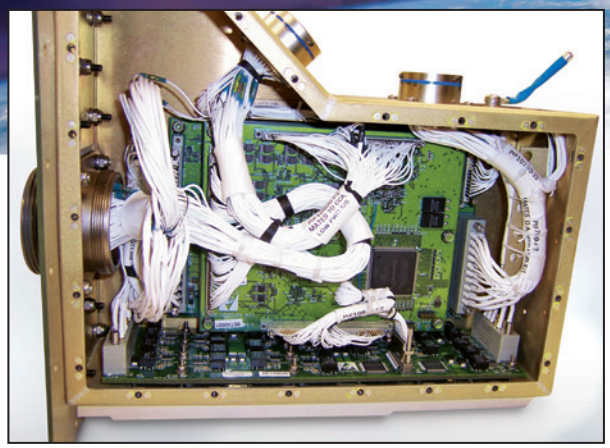
Vector Network Analyzer

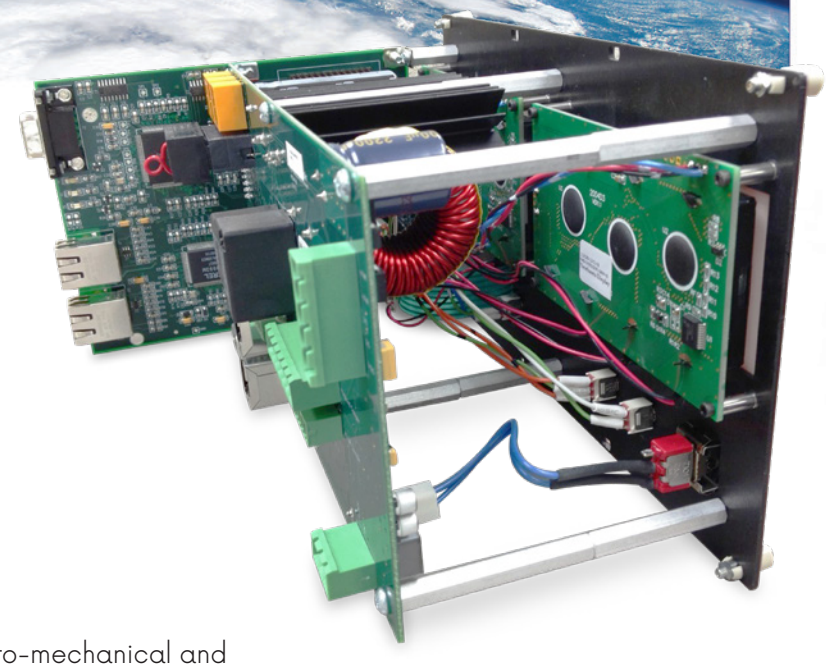
Custom Cable Assemblies

AirBorn's custom designed cables, utilizing our product and technology, meet rigorous space-rating requirements emphasizing quality, reliability and higher levels of performance. AirBorn provides design-in support to meet the high demands of the space market, while supporting all testing and program management endeavors. We test our cable assemblies to certify total dependability. Tests include: data transmission simulations, vector network analyzation (up to 50 gbs) to correlate simulation data to actual performance, in-circuit probing testing for post-production assemblies and PCB design/fabrication for validation of assemblies and components.

We're also proud to offer our FOCuS® brand of Space-Rated Active Optical Cables (SAOC®). Built on our proven, high-speed verSI connector platform, SAOC® exemplifies all the benefits of fiber with the ease & reliability of copper.

AirBorn manufacturing operators are NASA 8739.4 and IPC620 certified and trained to manufacture product for the space exploration market. Class I laser product that complies with FDA performance standards for laser products except for conformance with IEC 60825-1 Ed. 3, as described in Laser Notice No. 56, dated May 8, 2019.





Complete Custom Chassis/Box Builds

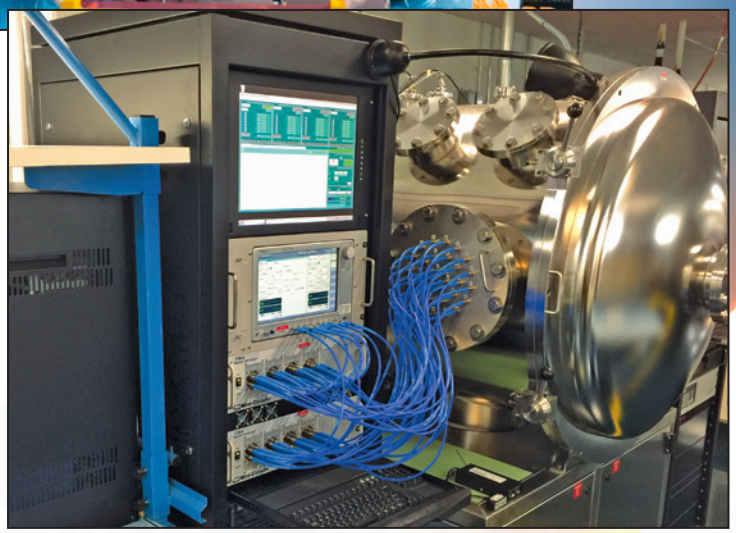
AirBorn can design and manufacture high-level electro-mechanical and complete chassis/box build assemblies according to your project's specific needs. Our Model-to-Market® service means we take our customer's most basic product idea and foster it through design, development, testing and mass production. Our extensive testing ensures your product consistently performs to expectations and is ready to take on the severities of space flight.

Processes to ensure the quality of your build:

- Cable & harness integration
- Detailed material planning & logistics management
- Multi-plant capabilities accommodate volume orders & on-time delivery
- Procurement & inspection of standard/custom parts
- UL & CSA certified manufacturing facilities

We fabricate many complete builds for our customers in space exploration. Each were manufactured to endure the punishing environs of rocket launches and space flight and reliably stand ready for more.

3500 AirBorn Circle — Georgetown, TX 78626 • p. 512.863.5585



Thermal Vacuum Chamber

Engineering & Lab Services

AirBorn employs 50+ degreed engineers in-house to assist in design and product development; expertly guiding from inception through mass production. AirBorn utilizes an A2LA accredited* laboratory to test against the highest standards imaginable to ensure our products stand up to the rigors of space exploration. From extreme temperature fluctuations to vibration & shock tests that simulate a violent launch, we design unmatched quality into our interconnects and cable assemblies to withstand a bumpy ride.

When your goal is to explore new worlds with unforgiving environments or achieve the longevity required to travel decades through interstellar space — count on AirBorn quality to get you there.

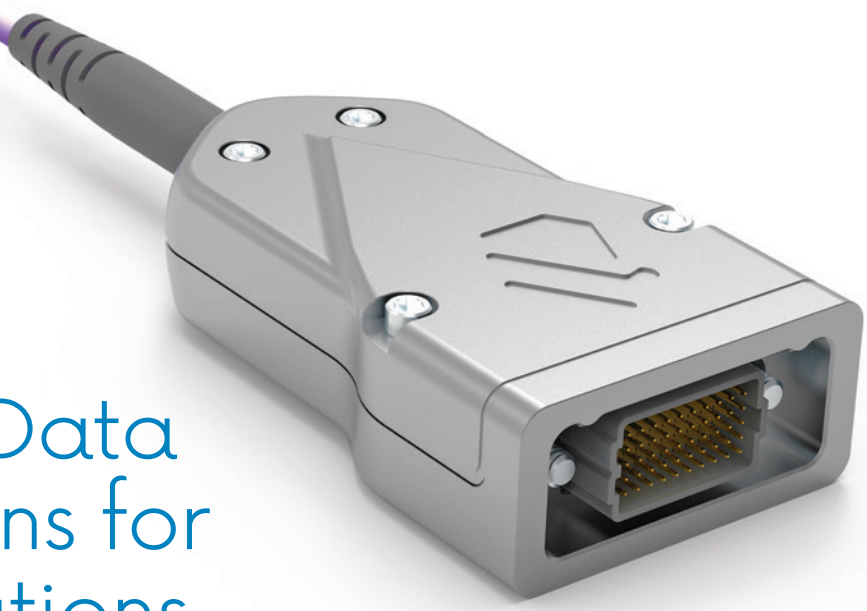
- Contact Engagement & Separation Forces
- Contact Retention/Wire Retention
- Dielectric Withstanding Voltage (Sea Level & Altitude)
- Durability
- Insert Retention
- Insulation Resistance
- Low Signal Level Contact Resistance
- Mating & Unmating Force
- Resistance to Soldering Heat
- Shock
- Solderability
- Temperature Cycling
- Vibration
- X-Ray/CT imaging & inspection

*Not all testing listed above is included in our A2LA Scope of Accreditation. Please consult A2LA Certificate #4132.01 for a list of accredited tests.

The FIRST Space-Rated Active Optical Cable

Available TODAY!

FOCuS®



Revolutionary Data Communications for Space Applications

AirBorn is excited to introduce the latest disruptive technology to hit the space market in a generation. Our FOCuS® active optical cable technology now embodies the fully-qualified, Space-Rated Active Optical Cable (SAOC®). Built on our proven, high-speed verSI connector platform, SAOC® exemplifies all the benefits of fiber with the ease & reliability of copper.

The verSI-based SAOC® is designed to operate at 4 channels, 12.5 Gbps per channel (50 Gbps aggregate). Radiation-hardened and non-outgassing components are used throughout the assembly to assure complete reliability. Optimizing size and weight factors in the design, we made certain the SAOC® is ideal for spaceflight and the extreme conditions that come to bear during a launch.

3500 AirBorn Circle — Georgetown, TX 78626 • p. 512.863.5585

Materials & Finishes

Pin Contacts (Male)	Material	BeCu per ASTM B194
	Finish	50uIN min localized Au per ASTM B488 type II, code C over 50uIN min Ni PER ASTM B689 type 1
Molded Insulator	Material	Glass-Filled Liquid Crystal Polymer (LCP) per ASTM D5138
Shell	Material	Aluminum alloy 6061-T6 per SAE AMS-4027 or 6061-T6511 per SAE AMS-QQ-A-200/8
	Finish	500uIN min electroless Ni per SAE AMS-2404, class 3
Hardware	Material	Stainless steel per ASTM A484/A484M, ASTM A582/A582M, or ASTM A320
	Finish	Passivated per SAE AMS-2700

Cable Performance

Parameter	Unit	Min	Typical	Max
Storage Temp. Range	C	-55		125
Case Operating Temp. Range	C	-40		90
TID Radiation Hardening	krad			>100
SEE MeVcm2/mg			>40	
Fiber Tension	N			30
Fiber Bend Radius	in.	2.5		
Operating Voltage	Vdd	3.15	3.3	3.45
Data Rate Per Channel	Gbps	1.25		12.5
Power Consumption	mW		670	1100
Bit Error Rate	BER			10^-12
Return Loss	dB		-8	
Rx Differential Output Voltage	mVp-p	250		900
Outgassing	Max. TML OF 1% and max. CVCM OF .1% per MIL-DTL-83513			

Pin-Out Details*

A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
ModselL	GND	GND	RX2-N	RX2-P	GND	GND	TX3-P	TX3-N	GND
B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
GND	RX4-N	RX4-P	GND	GND	TX1-P	TX1-N	GND	GND	GND
C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
GND	GND	GND	RX1-N	RX1-P	GND	GND	TX4-P	TX4-N	GND
D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
GND	RX3-N	RX3-P	GND	GND	TX2-P	TX2-N	GND	GND	ModrdyL
E1	E2	E3	E4	E5	E6	E7	E8	E9	E10
ResetL	GND	GND	SCL	SDA	GND	GND	FlagL	3.3V	3.3V

* All above pinout details are specific to verSI SAOC interconnect only.

ModselL	Module select, active low
ModrdyL	Module ready, active low
ResetL	Reset, active low
GND	Ground
SCL	Serial clock
SDA	Serial data

TXx-P	Transmit channel positive
TXx-N	Transmit channel negative
RXx-P	Receive channel positive
RXx-N	Receive channel negative
3.3V	+3.3 V primary supply voltage
FlagL	Flag, active low

Active Optical Cables
Overview

FOCuS®

Tomorrow's Communication Today

The FOCuS Active Optical Cable product line is designed to meet the requirements for high-speed/signal integrity applications while delivering the quality and reliability customers have come to expect from AirBorn.

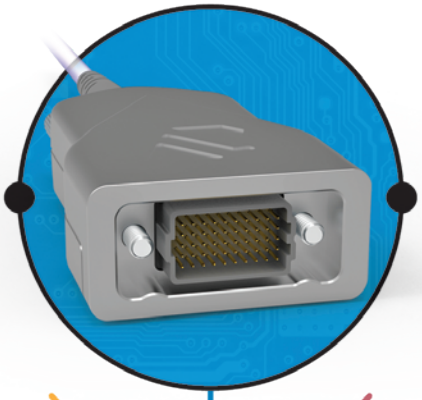
FOCuS affords design flexibility by offering vertical board-mount, right angle board-mount, AOC cable I/O, and Copper Cable I/O. The copper and AOC cables have the exact same pin-out to offer the flexibility of using either a copper cable for shorter lengths and easily changed to an Active Optic cable as needed.

Key Features & Benefits:

- Patented design
- Distances up to 100 meters
- Data rates of 12.5 Gbps/channel
- 4 Channels
- Rugged, light-weight, and low-profile cable
- EMI immune
- No fiber cleaning concerns
- Fast installation: mate & go
- No transceiver needed
- Evaluation kit available

3500 AirBorn Circle — Georgetown, TX 78626 • p. 512.863.5585

Q: What Applications Are AOCs Best Suited For?



A: Any Application Requiring One Of These:

High Speed
Supports speeds up to 12.5Gbps per channel.

Hassle-Free Fiber
Installed the same way as a copper cable.

Longer Distances
Delivers reliable high speeds up to 100m.

Sealed & Protected Optical Path
AOCs eliminate the number one cause of link failure – FOD (dirt on optics).

Weight Savings
Significant weight savings over copper cables.

Easier Maintenance Than Fiber
Factory terminated reduces potential for fiber contamination.

Reduced Space
Much smaller cable bundles and no need for transceiver on PCB.

Multiple Environments
Radiation-hardened space-rated as well as ruggedized option.

Improved EMI Protection
Fiber cable and shell design are critical for EMI reduction.

Design Flexibility
Using the common FOCuS pinout, copper and fiber are interchangeable.

The Time Is NOW: Active Optical Connectors & Assemblies

We engineered these fiber cable assemblies with Space, Military, Industrial, and Commercial Aviation applications in mind — but their practical uses extend into many industries. When you need dependability as well as performance, AirBorn's FOCuS AOCs are the answer for your toughest applications.

The AirBorn Advantage

Model-To-Market Solutions

Custom Power Systems

COTS VPX Power Supply Power Blade

Flexible Circuit Assemblies

Cable Assemblies

FUZE Assemblies

Active Optical Assemblies

Rectangular W Series

Rectangular R Series

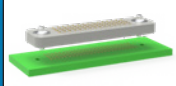
Micro D M Series

Nano D N Series

High-Speed Rectangular verSI

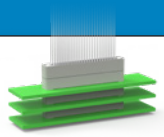
Modular Hybrid SInergy

Macro D RocKet



Z Axis Interposer Z Series

High-Speed Micro D microSI



Stackable RC Series

Circulars Series 360

Strip Connector AirStrip

PowerAmp 13A or 23A

Rugged Circulars TriMate

SB-2.24

AirBorn

p. 512.863.5585

www.airborn.com