

SECTION 1



LuxCis® ARINC 801 Contacts

F725



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Our Most Important Connection is with You.™

Introduction



Fiber optic solutions constantly face new challenges and more demanding specifications.

- Fiber optic components need to be lighter, smaller, more performant and withstand tougher operational conditions
- Optical systems also need to be easy to implement with minimum maintenance

To fully address these needs, Radiall offers the LuxCis® ARINC 801 product range, a proven flexible and always expanding fiber optic interconnect solution for MultiMode and SingleMode PC and APC applications in aerospace and other harsh environments.



Flying since 2003, the LuxCis® ARINC 801 contact exhibits excellent performance in the most severe environments. Its unique design provides high density capabilities and ease of manipulation, making it the first choice for the ARINC 801 standard and several major companies in various markets.



A COMPLETE INTERCONNECT SOLUTION

The same contact fits all connectors

The LuxCis® ARINC 801 product range combines Radiall expertise in fiber optics and in multipin interconnect solutions.

Refer to Section 2 for interconnect solutions with LuxCis® ARINC 801 contacts.

Introduction

MARKETS AND APPLICATIONS

LuxCis® ARINC 801 has been qualified for military and commercial aerospace programs and is used in many applications in oil and gas, naval, transportation and other industries with harsh environmental requirements.

Examples of applications for LuxCis® ARINC 801 contacts are:



Civil Aerospace

Airframe avionics, IFE (In-Flight Entertainment), HUD (Heads Up Display), power & flight management, pressurized and unpressurized area transmissions

Military Aerospace

Avionics, radar, weapons system, power & flight management

Data Transmissions

High speed data networking, including wavelength multiplexing, broadcast, radio signal

Radars

Remote antennas, phase array radar, military radio networking, satellite

Test Equipment

Modulator, repeater, transceivers, measurement and test equipment in laboratories

Navy & Shipboard

Radar and missile system, communication

Geophysics

Oil & gas, mining, exploration with streamers arrays, roofers and shearing equipment

Sensors

Structural, environmental and airborne sensors

INTERNATIONAL STANDARD DOCUMENTS COMPLIANCE

LuxCis® ARINC 801 design, developed by Radiall, has been used as the basis design for several standards.

The Radiall LuxCis® ARINC 801 interconnect solution is manufactured according to EN/AS/JISQ 9100 and is RoHS compliant. It also complies with the following standards:

ARINC Standard

Radiall solution, based on LuxCis® contact, has been voted as the FO interconnect solution for aerospace applications by the ARINC committee and airlines and is described in the ARINC 801 specification. ARINC 801 describes the contacts and the specific inserts used in MIL-DTL-38999 shells and EPX® connectors.

EN Standard

- EN4639-0XX: describing the LuxCis® inserts for the EN4644 (EPX®) connectors
- EN4639-101: describing the LuxCis® contact
- EN4640: describing the LuxCis® configurations for ARINC 600 connectors
- EN4645: describing the LuxCis® configurations for MIL-DTL-38999 based connectors

SAE Standard

- AS 6250



Introduction

FEATURES AND BENEFITS

High Optical Performance

- Physical contact technology, proven interconnect with high optical performance
- Unique solutions available with APC capability, providing very low Return Loss (RL>65 dB)
- Ruggedized contact to meet harsh environment requirements while maintaining high optical performance

Robust Design

- Metal body
- Crimping on the cable, strengthening members & jacket
- Full pull-proof design on loose structure cables
- Keyed contact for APC applications, provides optimal alignment and prevents rotation

High Density Solution

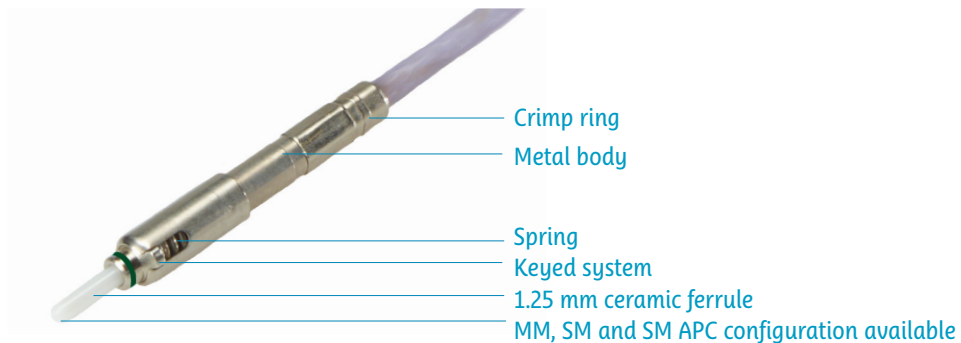
- Using 1.25 mm ferrule
- Up to 12 LuxCis® ARINC 801 contacts in each EPX® EN4644 insert
- Up to 32 LuxCis® ARINC 801 contacts in MIL-DTL-38999 size 25 circular connector

User-Friendly

- Uses a standard size 16 plastic tool for insertion and extraction
- Dedicated multipin connectors with removable sleeve holder for optimal ease of termini cleaning and inspection process
- Full range of tooling kits available
- Compatible with LC test equipment

Versatile Solution

- Same contact fits in a wide range of connectors with maintained optical performance
- Hermaphroditic: no pin and socket configuration
- Available in MultiMode PC, SingleMode UPC and SingleMode APC
- Compatible with a wide range of cables and fiber types
- Interconnect hybrid solutions
- Hermetic configurations available



Characteristics and Performance

The LuxCis® contact has been qualified per ARINC 801 and EN standards. Please refer to these documents for detailed information. The LuxCis® ARINC 801 product range has passed many other qualifications, including customer driven qualifications. The values mentioned do not represent maximum achievable results but tested values.

Main results and performance information are in the following tables:

OPTICAL CHARACTERISTICS

	SingleMode UPC	SingleMode APC	MultiMode PC
Wave length	1310-1550 nm		850-1300 nm
Insertion Loss			
Mean	0.15 dB	0.2 dB	0.10 dB
Standard deviation	0.10 dB	0.12 dB	0.07 dB
Return Loss	>50 dB	>65 dB	>20 dB

Insertion Loss against a reference patchcord: IEC 61300-3-4 Method B, also described in ARINC 805

Return Loss: IEC 61300-3-6, also described in ARINC 805

MECHANICAL AND ENVIRONMENTAL CHARACTERISTICS

Test	Standard	LuxCis® in EN4644 (EPX®) Connector	LuxCis® in Mil-DTL-38999 (R8) Connector	LuxCis® in ARINC 600 (NSX) Connector	LuxCis® in LxC-R® Single Channel Connector
Thermal cycling	SAE AS 13441 method 1003.1	-55°C/+125°C (cable dependent)			
Temperature endurance	TIA/EIA 455-4	1000 h @ 125°C (cable dependent)			
Vibration	TIA/EIA 455-11	27 Grms	43 Grms 60 G sinus	16.4 Grms	50 Grms
Shocks	TIA/EIA 455-14	50 G, 11 ms	300 G, 3 ms	50 G, 11 ms	300 G, 3 ms
Durability	TIA/EIA 364-09	100 cycles	500 cycles	500 cycles	500 cycles
Maintenance aging	SAE AS 13441 method 2002.1	10 cycles			
Cable retention 1.8 mm diameter	SAE AS 13441 method 2009.1	68 N			
Cable retention 0.9 mm diameter	SAE AS 13441 method 2009.1	7 N			
Humidity	TIA/EIA 455-5	10 cycles/24 h - 90% RH - -25°C/+65°C			
Salt spray	SAE AS 13441 method 1001.1	96 h	2000 h	48 h	500 h
Altitude immersion	TIA/EIA 455-15A	Minimum pressure equivalent to an altitude of 15,200 m (50,000 ft.).			

For any additional information, please contact your local Radiall representative.

Product Range

OPTICAL CONTACT

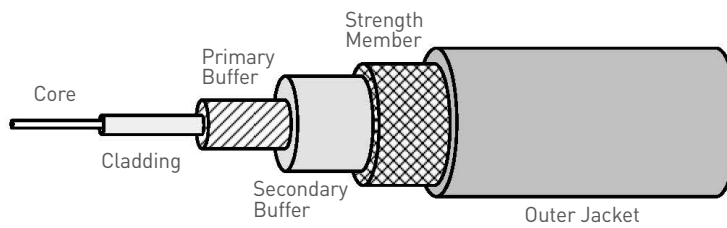
The LuxCis® ARINC 801 contact has a variety of different part numbers to accommodate many configurations: SingleMode APC, SingleMode UPC and MultiMode as well as loose and tight structure cables and various cable diameters.

Outside dimensions of the LuxCis® ARINC 801 contact do not change but the internal ones comply with the structure of the cable. Hence the construction of the LuxCis® ARINC 801 contact part number depends on which cable or fiber type is desired.

The structure of a cable is defined per ARINC 802:

Loose structure: A fiber optic cable structure that allows slight movement of the secondary buffer next to the inner strength members and outer cable jacket.

Tight structure: A fiber optic cable structure that allows no movement of the fiber and secondary buffer with respect to the outer jacket.



The LuxCis® contact range can accommodate virtually all the cables used for aerospace and military applications (ARINC, SAE, EN, FONDA, MIL). For any additional information, please contact your local Radiall representative.

HOW TO ORDER

F725 0 03 419

F725: ← LuxCis® ARINC 801 series

- Ferrule type:** ←
- 00:** PC ferrule for 9/125 µm SingleMode fiber
 - 03:** PC ferrule for 50/125 or 62.5/125 µm MultiMode fiber
 - 04:** PC ferrule for 100/140 µm MultiMode fiber
 - 05:** PC ferrule for 200/230 µm MultiMode fiber
 - 50:** APC ferrule for 9/125 µm SingleMode fiber

- Cable type and diameter:** ←
- 118:** 900 µm cable
 - 318:** 1.2 mm cable with strengthening members, tight structure
 - 419:** 1.6 to 2.2 mm cable, loose structure
 - 519:** 1.6 to 2.2 mm cable, tight structure

For instance, to terminate a loose structure cable with a cable diameter size from 1.6 to 2.2 mm for a MM PC application, the part number F725 003 419 is needed.

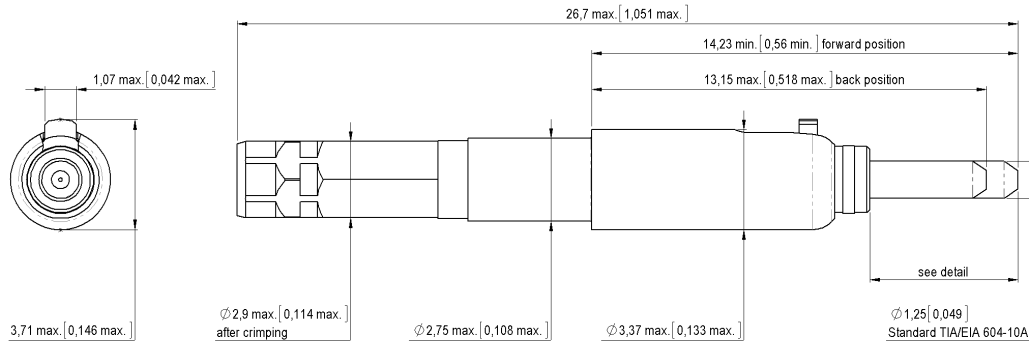
LuxCis® contact part numbers cross-referenced with ARINC 801 equivalent:

Part Number	ARINC 801 Equivalent
F725 003 419	LM (Loose MultiMode)
F725 000 419	LS (Loose SingleMode)
F725 050 419	LSA (Loose SingleMode APC)
F725 003 519	TM (Tight MultiMode)
F725 000 519	TS (Tight SingleMode)
F725 050 519	TSA (Tight SingleMode APC)

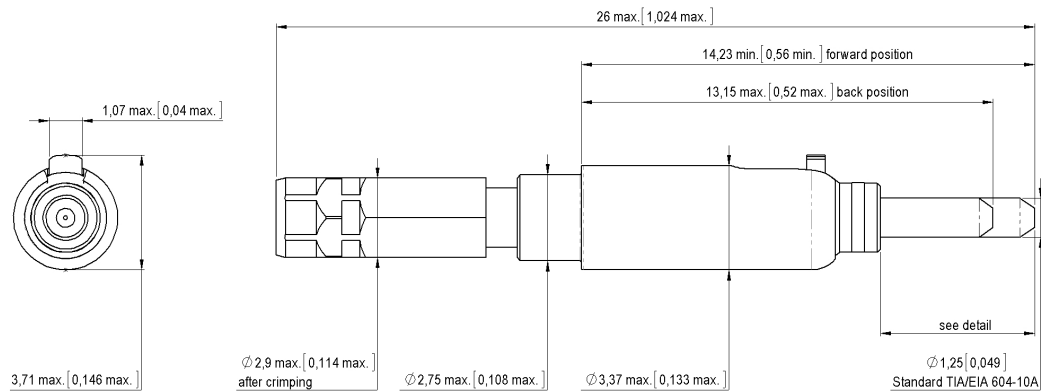
Product Range

OPTICAL CONTACT DIMENSIONS

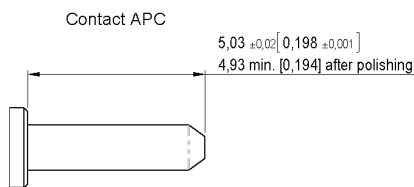
LuxCis® ARINC 801 contact for loose structure cables: pull-proof



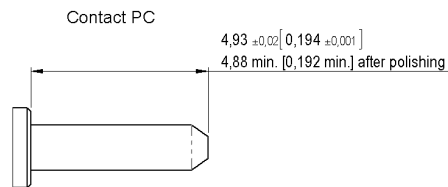
LuxCis® ARINC 801 contact for tight structure cables: not pull-proof



APC LuxCis® ARINC 801 contact



UPC LuxCis® ARINC 801 contact



Color code on the contact to facilitate fiber and polishing recognition:



SingleMode APC LuxCis® ARINC 801 contacts feature a **green** line around the ferrule holder.



SingleMode UPC LuxCis® ARINC 801 contacts feature a **blue** line around the ferrule holder.


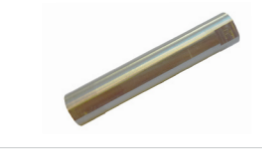






MultiMode LuxCis® ARINC 801 contacts feature no line of color.

Product Range

ADAPTERS

The following adapters require the use of a standard size 16 M81969/14-03 tool (Radiall PN:282 515) to insert or extract the LuxCis® ARINC 801 contact.

Description	Part Number	
LuxCis® to LuxCis® adapter, simplex bulkhead feedthrough	F725 701 100	
LuxCis® to LuxCis® adapter, simplex straight	F725 700 100	
LuxCis® to LuxCis® adapter, duplex, for PCB	F725 745 000	
LuxCis® to LC adapter, simplex, LC panel cut-out	F719 060 000	
LuxCis® to LC adapter, duplex, LC panel cut-out	F719 058 010	
LuxCis® to LC adapter, duplex, MIL-DTL-38999 panel cut-out	F719 058 000	

Quick release adapters do not require the use of any tool. This feature makes them ideal for measurements and tests in laboratories.

Description	Part Number	
LuxCis® to LuxCis® adapter, quick release	F780 799 001	
LuxCis® to LC adapter, quick release	F780 799 000	

All LuxCis® ARINC 801 adapters use zirconia ceramic alignment sleeves. Their mechanical endurance is up to 200 mating cycles.

Accessories and Tools

TOOL KITS



To support customers in maintenance and manipulation of optical systems, Radiall offers a full range of kits, tools and accessories.

The LuxCis® ARINC 801 tool kits provide efficient, easy and reliable fiber optic inspection, cleaning, termination and polishing. Radiall's tool kits feature high quality tools and materials, state-of-the-art devices and detailed procedures.

Termination and Polishing Kits

Part Number	Description
F780 861 000	Termination kit (with 220 Volt curing oven)
F780 862 000	Termination kit (with 110 Volt curing oven)
F780 860 000	Polishing kit (with mechanical polisher)



Termination kit
F780 861 000 or F780 862 000



Polishing kit
F780 860 000

Inspection and Cleaning Kits

Part Number	Description
F780 538 000	PREMIUM Inspection & Cleaning kit (with handheld video display)
F780 539 000	Inspection & Cleaning kit (without handheld video display)
F780 541 000	Cleaning supplies kit (for Inspection & Cleaning kit replenishment)



PREMIUM Inspection &
Cleaning kit
F780 538 000

Note: Radiall also supplies effective test solutions to measure Insertion Loss, Return Loss and end face geometry of LuxCis® ARINC 801 fiber optic contacts.

Refer to Section 11, Tool Kits and Accessories, for more information on Radiall's tooling offers.

Please note photos shown serve only as a reference and actual product may vary.

Accessories and Tools



Inspection Assistant Kits

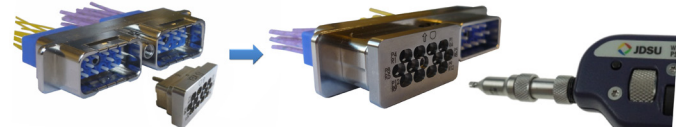
To support and ease the inspection and cleaning process, Radiall has developed dedicated devices enabling trouble-free maintenance of LuxCis® ARINC 801 contacts inside multipin connectors: EPX® EN4644 and R8 MIL-DTL-38999.

With the inspection assistant guides, there is no need to take extra precaution when inspecting and cleaning the optical end face. This device can be used with the microscope probe included in the Radiall Inspection & Cleaning kit (F780 538 000 and F780 539 000).

In MIL-DTL-38999 type connectors:



In EPX EN4644 connectors:



Key features:

- Optimized inspection and cleaning process
- No extra manipulation: guide cavities designed to permit the cleaning of the optical end face without removing the guide
- Ease of handling
- Adapted to PC, UPC and APC LuxCis® ARINC 801 fiber optic contacts
- Available for EPX® EN4644 and MIL-DTL-38999 type connectors

Assistant inspection guides are available in a complete kit or as individual items.

Series	Description	Part Number
Inspection assistant for LuxCis® inside R8 MIL-DTL-38999 type connectors	Full kit: - Guides for R8 plugs and receptacles from size 11 to 25 - Dedicated tips for microscope probe (F780 725 000 ⁽²⁾ for APC and F780 725 001 ⁽²⁾ for PC) - Cleaning sticks to clean the guide cavities	F780 725 200
	Individual guide for plug size X ⁽¹⁾	F780 725 0XX ⁽¹⁾
	Individual guide for receptacle size X ⁽¹⁾	F780 725 1XX ⁽¹⁾
Inspection assistant for LuxCis® inside EPX® EN4644 connectors	Individual guide for EPXB plug and receptacle	F780 725 300
Tips for digital microscope probe	Tips for PC polishing	F780 725 001 ⁽²⁾
	Tips for APC polishing	F780 725 000 ⁽²⁾
	Angled tip for inspection of PC termini in hard-to-reach areas	F780 898 001 ⁽²⁾

⁽¹⁾Replace X by the size (from 11 to 25) of the connector you wish to inspect and clean.

⁽²⁾Tips to be assembled with the narrow long type barrel (F780 898 000) to be attached on the microscope probe

Accessories and Tools

MASTER CORDS

Radiall offers a broad range of high performance Master Cords, also known as Gold cables or Aerospace Measurement Quality Jumpers (AMQJ) as defined in ARINC 805. They are manufactured and tested using the latest measurement processes and standards. Used to accurately measure optical properties of optical systems, they offer very low optical losses.





The end face control processes, including geometry and concentricity tests, meet the criteria per the latest version of Telcordia GR-326-CORE. Radiall's Master Cords also comply with ARINC 805, TIA/EIA-455-171A, CEI 60874-14-1 and CEI 61754-4 specifications.



LuxCis® ARINC 801 Master Cords are available in various configurations and can be terminated with the following extremities: LC, SC, ABS1379, FC.

Refer to Section 11, Tool Kits and Accessories, to see the list of available part numbers.

ACCESSORIES

Description	Packaging	Part Number	
Plastic insertion/extraction tool, size 16 (M81969/14-03)	1 piece	282 515	
Dynamometric screwdriver for sleeve holder removal and installation	1 piece	F780 638 000	
1 bag of 10 dust caps for LuxCis® ARINC 801	1 bag of 10 pieces	F718 176 104	
1 bag of 100 dust caps for LuxCis® ARINC 801	1 bag of 100 pieces	F718 176 204	
1 bag of 100 sealing plugs for LuxCis® ARINC 801 cavities	1 bag of 100 pieces	F718 211 200	

F718 211 200: LuxCis® ARINC 801 Sealing Plugs:

Sealing plugs are specifically designed to fill the unused ARINC 801 cavities of multipin connectors such as EPX® EN4644, QM, NSX ARINC 600, MIL-DTL-38999 and others.

- Mimic the shape of a terminated LuxCis® ARINC 801 contact
- High temperature and fluid resistant
- Ergonomic design for easy insertion and extraction



Refer to Section 11, Tool Kits and Accessories, for more information on Radiall's tooling offers.

LuxCis® ARINC 801 Cable Assemblies

RADIALL CAPABILITY

With over 40 years of fiber optic experience, Radiall is a global leader in the design and development of high quality harnesses and complex optical systems for demanding applications. All products are manufactured in AS9100 certified assembly lines. Each cable assembly is visually inspected and tested per the criteria of the relevant industry standards (ARINC, EN, SAE, IEC).

Radiall can provide either standard cable assemblies or build-to-print configurations.

- Standard cable assemblies (also called Standard Jumpers) enable high reactivity and short lead time due to the direct availability of components and established manufacturing processes.
- With the build-to-print solution, Radiall complies with customer requirements, offering flexible designs and manufacturing processes to build assemblies to customers' exact specifications.

Flexible assembly processes enable Radiall to respond to low to high volume requirements.

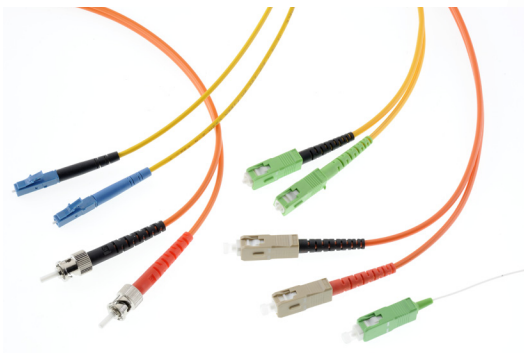
Radiall offers various polished and tested assemblies, with commercial and harsh environment components including:

Cables:

- Aerospace grade cable, loose structure, type ARINC 802, BMS 13-71, temperature range (-55°/+125°C)
- Aerospace grade cable, tight structure, type ARINC 802, ABS0963, temperature range (-55°/+125°C)
- Commercial grade cable "not for flight" for ground test applications
- MIL cable
- Ruggedized, armored and anti-rodent telecom cable for outdoor applications
- Loose, tight and ultra tight structure cables
- Simplex, scindex and duplex cables

Connectors:

- LuxCis® ARINC 801 contacts
- LC, SC, ST, FC ruggedized connectors
- Radiall ABS1379 contacts
- Size 12 and 16 MIL-PRF-29504 type termini
- MT based connectors



LuxCis® ARINC 801 Assemblies

HOW TO ORDER: STANDARD JUMPERS FOR HARSH ENVIRONMENTS

Radiall designs, manufactures and delivers high quality cable assemblies. They are manufactured in AS9100 certified assembly lines. The cable assemblies are visually inspected and tested per the criteria of the relevant industry standards (ARINC, EN, SAE, IEC).

LUXCISMM 52 LCMM L100

End 1:

LUXCISMM	LuxCis®	MultiMode	
LUXCISSM	LuxCis®	SingleMode	UPC (RL>50dB)
LUXCISSM8	LuxCis®	SingleMode	APC 8° (RL>65dB)
LCMM	LC	MultiMode	
LCSM	LC	SingleMode	UPC (RL>50dB)
LCSM8	LC	SingleMode	APC 8° (RL>65dB)
SCMM	SC	MultiMode	
SCSM	SC	SingleMode	UPC (RL>50dB)
SCSM8	SC	SingleMode	APC 8° (RL>65dB)
FCMM	FC	MultiMode	
FCSM	FC	SingleMode	UPC (RL>50dB)
FCSM8	FC	SingleMode	APC 8° (RL>65dB)
STMM	ST	MultiMode	
STSM	ST	SingleMode	UPC (RL>50dB)
ABS1379MM	ABS1379	MultiMode	

Cable:

14	900 µm	MM 62.5/125 µm	loose	Simplex	aerospace grade
15	900 µm	MM 62.5/125 µm	tight	Simplex	aerospace grade
16	900 µm	MM 50/125 µm	loose	Simplex	aerospace grade
13	900 µm	MM 62.5/125 µm	loose	Simplex	commercial grade
11	900 µm	MM 62.5/125 µm	tight	Simplex	commercial grade
10	900 µm	MM 50/125 µm	tight	Simplex	commercial grade
60	900 µm	SM 9/125 µm	tight	Simplex	commercial grade
52	1.8-2 mm	MM 62.5/125 µm	loose	Simplex	aerospace grade
52D	1.8-2 mm	MM 62.5/125 µm	loose	Duplex	aerospace grade
53	1.8-2 mm	MM 62.5/125 µm	tight	Simplex	aerospace grade
55	1.8-2 mm	MM 50/125 µm	loose	Simplex	aerospace grade
78	1.8-2 mm	MM 50/125 µm	tight	Simplex	aerospace grade
92	1.8-2 mm	SM 9/125 µm	loose	Simplex	aerospace grade
23	1.8-2 mm	MM 62.5/125	loose	Simplex	commercial grade
40	1.8-2 mm	MM 62.5/125 µm	loose	Scindex	commercial grade
27	1.8-2 mm	MM 50/125 µm	loose	Simplex	commercial grade
39	1.8-2 mm	MM 50/125 µm	loose	Scindex	commercial grade
73	1.8-2 mm	SM 9/125 µm	loose	Simplex	commercial grade
77	1.8-2 mm	SM 9/125 µm	loose	Scindex	commercial grade

End 2:

See End 1

X no termination

Length of the cable in centimeters

Standard length tolerance in centimeters	
from 12 to 100 cm	0/+2.4 cm
from 100 to 1500 cm	0/+3.4 cm
from 1500 to 3000 cm	0/+4.4 cm
from 3000 to 5000 cm	0/+17.4 cm

To validate a part number please consult your Radiall representative. Technical datasheets are available upon request. Specific requirements (additional tests, specific labeling and additional protection of the cable) or any other cable assembly configuration can be accommodated on demand.

Our Most Important Connection is with You.™

LuxCis® ARINC 801 Assemblies

OPTICAL SYSTEM CAPABILITY

Radiall's design and manufacturing expertise, together with its wide interconnect product offering, enable Radiall to meet customers' needs for custom harness solutions.

Available to provide support for optical links requiring excellent performance and ease of installation, as well as develop application specific accessories or interconnect solutions when required.

Radiall is able to support a wide range of requirements, from simple contact and connector solutions to the most complex fiber optic based harnesses or sub systems for harsh environments.



Refer to Section 9 for more information on Radiall's optical systems, harnesses and cable assembly capabilities. For any additional information, please contact your local Radiall representative.