INTELLIGENT RELEASE INTER-CONNECT SYSTEM (IRIS™)

A Revolutionary Fiber Optic Inter-Connect System

Overview

Optical Cable Corporation (OCC®) introduces a revolutionary fiber optic inter-connect system, which disengages upon impact to a traffic control enclosure. IRIS™ allows for a fully restored fiber optic connection, without field repair or re-termination of the fiber optic cable. Most importantly, IRIS protects the installed fiber plant from damage when the control enclosure is impacted.

Designed to sense mechanical axial and shear loads from within the traffic control enclosure, IRIS's patent-pending release technology releases and separates, thereby protecting the installed fiber plant. When the sensing ring is pulled by a horizontal force within a 360° horizon, the mechanical latch surrounding the engaged fiber optic connector is tripped. The multi-channel fiber optic connector disengages and retracts under positive pressure, thus ejecting the plug to "break away" from the receptacle in milliseconds, avoiding collateral damage by the collapsing traffic control cabinet.

- Plug-and-play inter-connect
- Eliminates fiber maintenance points
- First completely dust proof and waterproof system
- Pre-terminated to eliminate field installation time and cost
- Minimizes collateral damage
- Minimizes downtime
- First true reusable breakaway system
- No need for additional patch cords or panels
- True backbone fiber protection

Background

Intelligent Transportation Systems, or ITS, encompasses a broad range of wireless and fiber optic communications-based information, control and electronics technologies. When integrated into the transportation system infrastructure, these technologies help monitor and manage traffic flow, reduce congestion, provide alternate routes to travelers, enhance productivity and save time, money and lives.

Given the emphasis of increased fiber optic inter-connect within the ITS architecture, protecting and restoring fiber connectivity within the traffic control cabinet is critical (especially given the increased fiber count) to provide control as well as protect revenue-bearing services such as traffic violation detection. Destruction of a traffic control cabinet results in lost synchronization, productivity and time, as well as the loss of thousands of dollars to repair multiple fiber optic cables at any given intersection. Protecting the installed fiber plant with IRIS greatly reduces the impact from both financial and out-of-service conditions.

Step 1
IRIS installed in traffic control cabinet.

Step 2
The IRIS is armed by removing the safeguard ring (yellow item in shown step one).

Step 3
The sensing ring (silver color) is pulled in any 360˚ direction by tethers from within the cabinet. The positive spring pressure ejects the plug within milliseconds.

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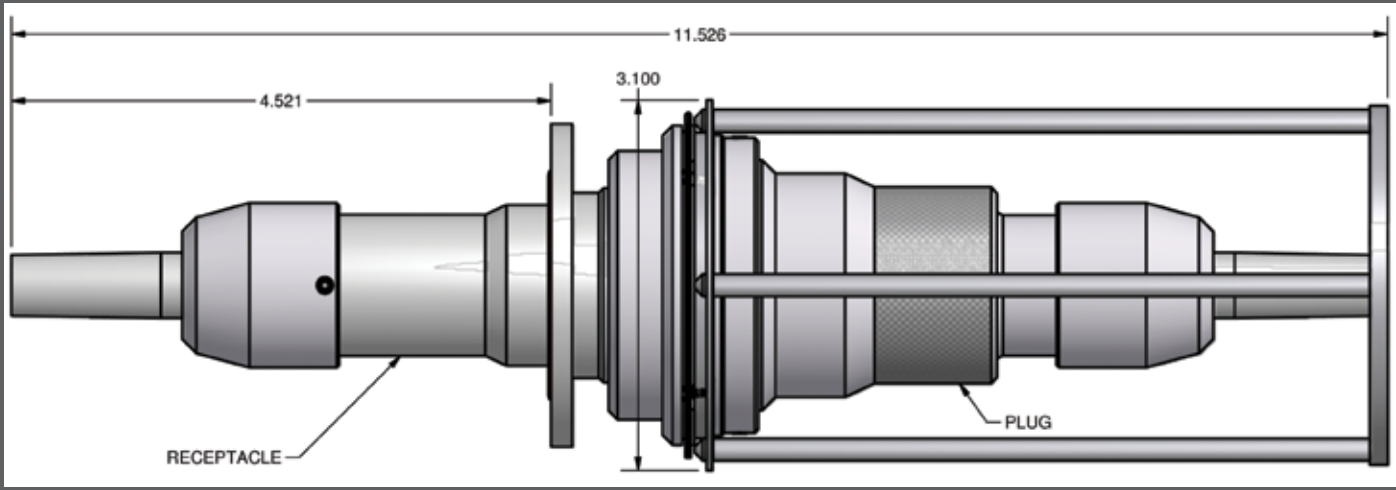
Features and Benefits

FEATURES		BENEFITS
Fiber Optic Inter-Connect System capable of surviving and restoring service after server mechanical impact		The IRIS™ system protects the investment of the outside plant by disengaging upon mechanical impact or detonation. Fiber Optic service is easily restored by re-arming the IRIS connector installed within a new enclosure.
Environmental Design		The IRIS™ Inter-Connect system is designed to operate within uncontrolled environments and survive temporary submersible conditions. The sealing features also prevent accumulation of dust and debris, thus extending the field maintenance lifecycles.
Mechanical Detonation System		Enables Fiber Connector system to disengage rapidly and without damaging fiber optic contacts.

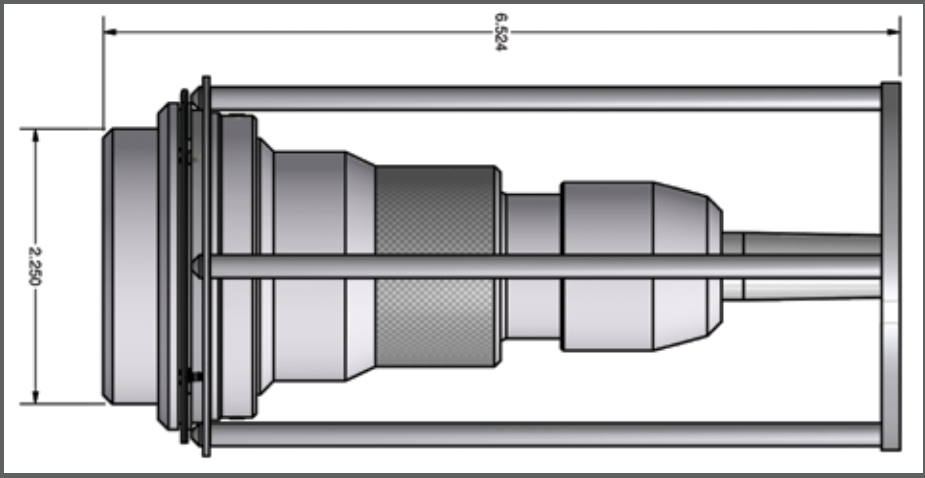
Features and Benefits

FEATURES		BENEFITS
Circular Sensing Ring		Allows tethering from all four quadrants within a traffic control cabinet.
Arming Ring		Allows field service personnel to safely re-arm or service the system without accidently detonating the connector.
Designed for 2 CH, 4 CH, 6 CH, 8 CH and 12 CH single-mode (9/125µm) fiber optic connectivity		The IRIS™ system can accommodate from 2 to 12 fiber optic channels. The plug side of IRIS features 6ft. pigtails with choice of ST, SC or LC simplex connectors. The Receptacle side is purchased with choice of fiber count and length of blunt end.
Turnkey, pre-tested fiber optic assemblies		IRIS™ enables efficient installation of pre-tested fiber optic assemblies within minutes. Though the receptacle pigtail is spliced into the fiber plant, the Plug/Receptacle connectors are all pre-terminated and test verified.

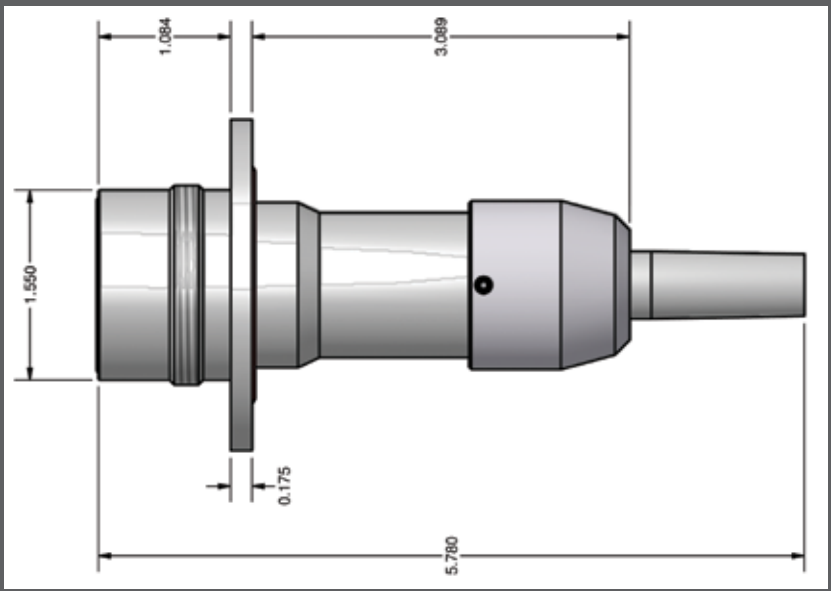
Product Drawing



Mated Plug with Jam-Nut Receptacle (2 CH–12 CH)



Plug (2 CH–12 CH)



Jam-Nut Receptacle (2 CH–12 CH)

Performance Specifications

PERFORMANCE SPECIFICATIONS		
SPECIFICATION	PARAMETER	RANGE
Insertion Loss	Single-Mode (9/125um)	0.35dB – Typical, 0.50dB – Maximum
Temperature	Operational	-46°C to 85°C
Temperature	Storage	-62°C to 85°C
Cable Retention[1]	TIA-455-6	200 lbs. for 10 minutes
Cable Seal Flexing	TIA/EIA-455-1	Procedure I
Twist	EIA-455-36	100 cycles, ±90° twist
Mating Durability	EIA-455-21	500 cycles
Impact[2]	TIA/EIA-455-2	Method B, 8 drops
Vibration	TIA/EIA-455-11C	Condition C, 1.5 hr/axis
Mechanical Shock	TIA-455-14	Condition C, 5 shocks/axis
Thermal Shock	TIA-455-71	Schedule C, -62°C 85°C, 5 cycles
Temperature Humidity Cycling	TIA/EIA-455-4	65°C at 95% RH
Life Aging	EIA/TIA-455-11	85°C, 250 hours
Water Pressure	TIA-455-98	Method A, Prod. A, 1M–24 hours
Sand and Dust	EIA/TIA-455-35	16 Hours
Salt Spray	TIA-455-16	Condition C, 250 hours

NOTES

1 When tested with military-rated fiber optic cable

2 Plug, Receptacle tested open-ended

Projected Cost Benefits of IRIS™

NO IRIS™				
SCENARIO	**COMPONENT FAILURE**	**RESULT OF FAILURE**	**ESTIMATED RESTORE TIME**	**ESTIMATED RESTORE COST**
Vehicle hits cabinet, dislodging it from its pedestal.	Patch cables do not break away.	Electronics destroyed.	6 hours (if electronics are in stock)	$5,500.00
Vehicle hits cabinet, dislodging it from its pedestal.	Drop cable is pulled back from splice point.	Destroyed drop cable and possible damage to splice case and main fiber trunk.	10 to 14 hours (if drop cable is in stock)	$6,500.00 to $10,000.00 (depending on extent of damage)
Vehicle hits cabinet, dislodging it from its pedestal.	Patch cables break away as intended.	Broken patch cables, must be replaced.	4 hours (if patch cables are in stock)	$600.00
Flood fills cabinet above fiber connection.	Connector is backfilled with muddy water.	System incapable of transmission.	8 hours (after flood water subsides)	$2,750.00 (includes connector interface replacement)
Dust storm penetrates cabinet.	Connector becomes contaminated with dust.	System incapable of transmission.	4 hours	$450.00
ESTIMATED DAMAGE MODEL				**$15,800.00 Minimum**

WITH IRIS™				
SCENARIO	**COMPONENT FAILURE**	**RESULT OF FAILURE**	**ESTIMATED RESTORE TIME**	**ESTIMATED RESTORE COST**
Vehicle hits cabinet, dislodging it from its pedestal.	None – IRIS Connector trips. Backbone, drop cable and electronics stay intact.	Temporary loss of signal	5 minutes (after cabinet is reset)	$35.00
Flood fills cabinet above fiber connection.	None	No loss of signal	0 hours	$0.00
Dust storm penetrates cabinet.	None	No loss of signal	0 hours	$0.00
ESTIMATED DAMAGE MODEL				**$35.00**

Notes:
Time and material cost estimates are taken from real restoration projects and only reflect actual time to secure required replacement materials, install and test the fiber optic portion of the restoration. No delays for equipment reset or equipment access delays have been considered.

Ordering Information

IRIS Assembly	IR	A	12	A	–	AA	–	BA	–	0100	F

A – SM 9/125 µm (Bend Insensitive)
C – SM 6/125 µm
D – MM 50/125 µm
F – MM 62.5/125 µm

02 – Two Fiber
04 – Four Fiber
06 – Six Fiber
08 – Eight Fiber
12 – Twelve Fiber

A – Tight Buffered Outside Plant Distributions
B – Tight Buffered Outside Plant Distributions LSZH
D – Rodent Proof Armored Cable
E – Tight Buffered Breakout

CABLE LENGTH
0003 Feet
0006 Feet
0100 Feet
0250 Feet
0500 Feet
0750 Feet
1000 Feet
2000 Feet
5000 Feet

CONNECTOR TYPE B
BA – Blunt End
BB – OptiTip™ (AnyLAN™ system compatible)
BC – ST
BD – SC
BE – LC
*Use BA and BB for IRIS Plus (AA) & BC, BD, BE for IRIS Receptacle (AB)

CONNECTOR TYPE A
AA – IRIS Plug
AB – IRIS Receptacle

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