The solution for rugged active blind mate VPX interconnect systems

LightCONEX
Plug-in module and backplane connectors for VPX systems

The LightCONEX® active blind mate optical interconnect is a revolutionary solution for VPX systems that includes a fixed plug-in module connector and a floating backplane connector compatible with proposed VITA 66.5 standard. The low-profile plug-in module connector is screwed on the board edge through an interposer, saving board space and eliminating fiber cable handling. The backplane connector has a spring-loaded MT to ensure a secure MT to MT mating connection under extreme shock and vibration conditions.

Key advantages

- **Optical interconnect**: Mechanical Transfer (MT) ferrule with linear array of 12 or 24 parallel multimode fibers
- **Secure connection**: Spring within the backplane optical cable provides the mating force between plug-in module and backplane MTs.
- **Standards**: Designed following VITA 66.5 standard (forthcoming).
- **Maintenance**: Supports two-level maintenance.
- **Blind mate**: Eliminates fiber handling and frees up space on host board.
- **Robustness**: Tested for vibration and shock over industrial temperature range, exposure to humidity, salt fog, sand and dust, mate/un-mate cycles, following military specs.

**Configurations**

12.5G
- 4TRX (50G, full duplex), 12TX or 12RX (150G), 12TRX (150G, full duplex)

28G
- 4TRX (100G, full duplex), 12TX or 12RX (300G), in development

**Applications**

- VPX single board computing
- C4ISR embedded systems
- AESA radars
- Ethernet switches, high BW communication links

Two LightCONEX 12TRX Style A
(2 x 24 fibers total)

This Interface Concept 3U VPX card uses a LightCONEX LC 12TRX, 150G (full duplex) Style A.

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**LightCONEX styles A, B, and C product line**

**Backplane connector**

Different backplane face plates are available to accommodate VITA apertures:

- 450-00070: Backplane Face Plate (a) for aperture AP1
- 450-00064: Backplane Face Plate (b) for aperture AP1
- 450-00065: Backplane Face Plate for aperture AP2
- 450-00066: Backplane Face Plate for aperture AP3
- 450-00067: Backplane Face Plate (a) for aperture AP4
- 450-00068: Backplane Face Plate (b) for aperture AP4

**Inserts**

The face plate styles mate with insert styles. The inserts come with the required MT-terminated optical cable(s) and MT ferule(s). Compatibility is shown in above diagram:

- 450-00069: Backplane Insert Connector Style Aa
- 450-00062: Backplane Insert Connector Style Ab
- 450-00054: Backplane Insert Connector Style B
- 450-00042: Backplane Insert Connector Style C
- 450-00063: Backplane Insert Connector Style Crf

**Plug-in module connectors**

Optical transceiver with front mating plate

The plug-in module connectors are equipped with optical transceivers offering multiple transmit and receive and bandwidth configurations and with required interposers:

- LightCONEX 4TRX module: for Styles A, B, C, and Crf
- LightCONEX 12TX, 12RX, and 12TRX modules: for Styles A, B, C, and Crf
- LightCONEX28 4TRX, 12TX, and 12RX modules: for Style B, C, and Crf

**Interposers**

- 415-00012: 2.74 mm, 96 positions. Style A (ITP1)
- 415-00011: 3.03 mm, 233 positions. Style A (ITP2)
- 415-00018: 1 mm, 96 positions. Style B, C, and Crf (ITP3)
- 415-00019: 1 mm, 233 positions. Style B, C, and Crf (ITP4)
- 415-00035: 2 mm, 96 positions. Style B, C, and Crf (ITP5)
Backplane connector features

The LightCONEX backplane connector contains the Face plate and Insert. The connector is designed to provide float in both the X- and Y-directions to enable alignment of the MT ferrule mating interfaces. The design complies with the ANSI/VITA 66.4 mating requirements with the MT ferrule displacement occurring within the backplane connector. Single or dual MT ferrules and/or hybrid configurations (including RF coaxial contacts) are available.

- Spring-loaded MT ferrule (12-lane or 24-lane)
- Coarse and fine mating alignment
- Low profile: 10 mm height
- Compatible with 12-lane or 24-lane OM3 or OM4 fiber ribbon cable

The main components of the backplane connector are:

1. Face plates. Dedicated face plates are available for VITA 67.3 (apertures C, D, and E) and VITA 66.4.
2. Insert housing available in styles A, B, C, and Crf. The main components of the housing are:
   3. Primary alignment feature
   4. MT ferrule with alignment pins
   5. Optical cable assembly with springs.

Optical cable options are:

- **12 fibers MT**: 6 in. 12-fiber optical cable with MT12 termination at both ends, alignment pins, and a single MT clip.
- **24 fibers MT**: 6 in. dual 12-fiber optical cable with MT24 termination at one end and dual MT12 termination at the other, alignment pins, and 2 MT clips.

Style C and Crf

The LightCONEX backplane connector Style C design offers a single MT ferrule with the upper portion left open for other applications. The Crf backplane insert has holes to allow connector companies to add their RF connectors.

Plug-in module connector features

The LightCONEX plug-in module connector contains the optical transceiver with its MT ferrule, an LGA interposer, and a front mating plate. The front mating plate has the primary alignment feature socket and a hole to accommodate the MT from the transceiver.

The main components of the plug-in module connector are:

1. Front mating plate, with:
   2. Hole to accommodate MT from the transceiver
   3. Primary alignment feature socket
4. Optical transceiver
5. Interposer

**Style A**

The LightCONEX plug-in module connector Style A is unique style with the primary alignment feature socket located above the optical transceiver. These connectors require interposers ITP1 or IPT2.

**Style B, C, and Crf**

The LightCONEX plug-in module connector Style B, C, and Crf have front mating plates for each respective styles. The primary alignment feature is located below the optical transceiver. These connectors require interposers ITP3, ITP4, or IPT5.

- Style B has one optical transceivers and one cabled MT.
- Style C has one optical transceiver.
- Style Crf has one optical transceiver and the upper section of its front mating plate has 8 holes for RF connectors.

These plug-in module connectors are secured with screws directly to the edge of the host board along with their dedicated LGA interposers.

Style B

The LightCONEX backplane connector Style B design offers a combination of dual MT ferrule and can provide up to 48 fibers (2 x 24).

- The lower MT ferule mates with the plug-in module active MT, while the upper one is cabled.
**LightCONEX** optical performance

The LightCONEX LC and LightCONEX28 LC modules come in different configurations. They both feature CML data interface.

### LightCONEX LC 4TRX, 12RX, 12TX, and 12TRX

- **Performance**: 12.5 Gbps/lane from −40 °C to 100 °C
- **Reach**: up to 300 m, OM3 fiber
- **BER**: up to $10^{-12}$ with $−12$ dBm sensitivity
- **Power consumption**:
  - 1.4 W (12-lane, 12.5G)
  - 2.8 W (24-lane, 12.5G)

### LightCONEX28 LC 4TRX

- **Performance**: 28 Gbps/lane from −40 °C to 85 °C
- **Reach**: up to 100 m, OM3 fiber
- **BER**: up to $10^{-9}$ with $−9$ dBm sensitivity
- **Power consumption**: 1.4 W (4+4-lane, 28G)

### LightCONEX ordering information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Product Description</th>
<th>Lanes</th>
<th>Bandwidth (Gbps/lane)</th>
<th>Sensitivity (dBm)</th>
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* In development

THE **Light** on Board® Company

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