



**HiWire™**  
Active Electrical Cables



**Credo's distinctive purple HiWire™**

**Active Electrical Cables (AECs)** are plug and play copper interconnect cables designed for affordable, lossless operation at 100G, 200G, 400G, and 800G speeds. AECs come with built in retimer, gearbox, PCS and FEC terminations. AECs offer a high performance alternative to short, thick DACs and high power, high cost AOCs for data center and telecom applications.



# A New Connectivity Standard is Born

The demand for cloud computing, instant data streaming, and emerging applications including 5G, AI, and machine learning have pushed Hyperscale, enterprise and edge data centers to accelerate the deployment of 400G and 800G networks. However, traditional architectures, component availability, costs, and device limits on power and performance have presented significant hurdles to moving forward.

After years of research and development, Credo introduced HiWire™ Active Electrical Cables (AECs) as the next industry solution to solve the connectivity bottleneck. AEC technology was immediately embraced and over 50 cable, switch, datacenter and connectivity suppliers have joined the HiWire Consortium to accelerate the standardization and deployment of AECs.

## Introducing HiWire Active Electrical Cable

Credo HiWire Active Electrical Cables (AEC) have distinct advantages over standard copper DACs and high-performance AOCs or optics. This new category of lightweight, high performance, low power cable interconnects with integrated retimers and gearboxes have already been a disruptive force in data center implementations by redefining the cable interconnect and enabling the accelerated deployment for 400G and 800G.

**Low  
Power**



**Light  
Weight**



**Bend  
Radius**



**Speed  
Shifting/Retiming**



**Long Life**



**Standards  
Compliance**





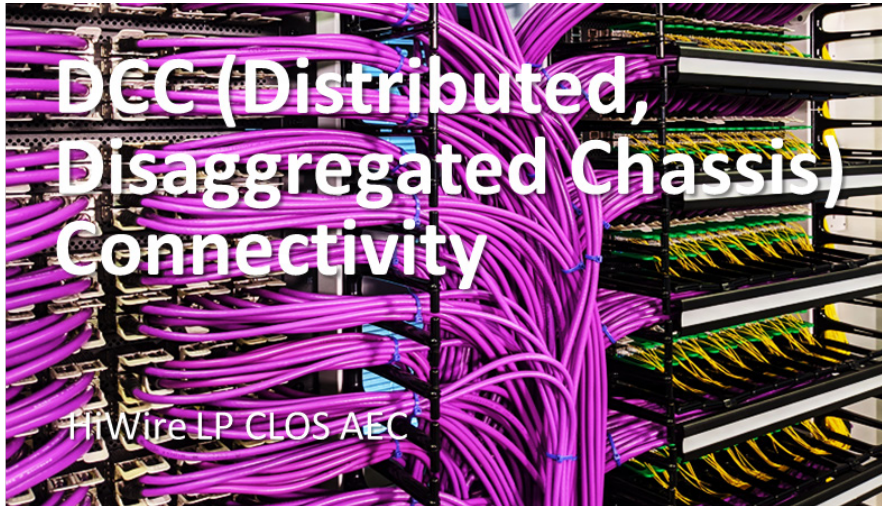
## Replacing DACs

- Up to 75% less weight and volume
- Tighter bend radius
- Longer reach up to 7m

## Replacing AOCs

- Up to 50% lower power
- Up to 50% lower cost
- 2.5X longer life

## Enabling Markets



DDCs replace proprietary, high-cost chassis using back panel interconnect with standards-based white box hardware, open source or 3rd party software and front panel interconnect. AECs take up to 75% less volume than DACs and up to 50% less power than AOCs enabling unprecedented DDC densities.

Of all data center cabling infrastructure, Server (NIC) to Top-of-Rack (TOR) switch links are undergoing the most innovations. AECs enable extended lengths for shared TORs, gearboxing for NRZ-PAM4 links and advanced functions enabling network managed redundancy and security.



# Credo AEC Families

## LP SPAN/SPAN AEC

Replace AOCs with low power plug and play AECs for port-to-port and rack-to-rack connectivity.



### Key Features

- Up to 7m (LP SPAN) and 5m (SPAN)
- Up to 50% less power than optics
- Up to 50% lower cost than optics
- Up to 2.5x longer life than optics

### Common Implementations

HiWire SPAN/LP AECs are commonly used in Distributed Disaggregated Chassis (DDC) implementations.

## SHIFT AEC

Deliver plug and play connectivity between PAM4 ports and NRZ NICs with speed shifting and FEC termination in-cable.



### Key Features

- Up to 5m length
- Up to 50% less power than optics
- Up to 50% lower cost than optics
- Up to 2.5x longer life than optics

### Common Implementations

HiWire SHIFT cables are commonly used in NIC to TOR and Spine/Leaf applications where a PAM4 port must be mated to a legacy NRZ port.

# Credo AEC Families

## LP CLOS AEC

Designed to replace backplanes in chassis with front panel interconnect used in Distributed, Disaggregated Chassis (DDC) applications.



### Key Features

- 400G cables as thin as Cat6
- Up to 2.5m length
- Up to 50% less power than optics
- Up to 75% volume than DACs
- Up to 1,000 cables per rack routing density

### Common Implementations

HiWire LP CLOS AECs are commonly used in Distributed Disaggregated Chassis (DDC) implementations.

## SWITCH/LP SWITCH AEC

Designed to enable Network Managed NIC to dual TOR connectivity in an Active/Standby configuration.



### Key Features

- Natively supported in SONiC
- Fully NOS Managed
- Automatic/Manual Failover at <1ms
- Full observability and control for all cable ends

### Common Implementations

HiWire SWITCH/LP SWITCH AECs are commonly used in TOR-to-NIC applications.

# Distinctive Purple HiWire AECs

| A SIDE                |           |      | AEC CABLE |           | B SIDE  |            |      |                           |
|-----------------------|-----------|------|-----------|-----------|---------|------------|------|---------------------------|
| SPEED                 | CONNECTOR | MODE | TYPE      | REACH     | SPEED   | CONNECTOR  | MODE |                           |
| <b>400G TO 400G</b>   |           |      |           |           |         |            |      |                           |
| 8 X 56G               | QSFP-DD   | PAM4 | LP CLOS   | 0.5M-2.5M | 8 X 56G | QSFP-DD    | PAM4 | <a href="#">Datasheet</a> |
| 8 X 56G               | QSFP-DD   | PAM4 | LP SPAN   | 3M-7M     | 8 X 56G | QSFP-DD    | PAM4 | <a href="#">Datasheet</a> |
| 8 X 56G               | QSFP-DD   | PAM4 | SPAN      | 3M-5M     | 8 X 56G | QSFP-DD    | PAM4 | <a href="#">Datasheet</a> |
| <b>400G TO 100G</b>   |           |      |           |           |         |            |      |                           |
| 8 X 56G               | QSFP-DD   | PAM4 | SHIFT     | 3M-5M     | 4 X 28G | 4 X QSFP28 | NRZ  | <a href="#">Datasheet</a> |
| 8 X 56G               | QSFP      | PAM4 | SHIFT     | 3M-5M     | 4 X 28G | 4 X QSFP28 | NRZ  | <a href="#">Datasheet</a> |
| <b>200G TO 200G</b>   |           |      |           |           |         |            |      |                           |
| 4 X 56G               | QSFP56    | PAM4 | LP SPAN   | 3M-7M     | 4 X 56G | QSFP56     | NRZ  | <a href="#">Datasheet</a> |
| 4 X 56G               | QSFP56    | PAM4 | SPAN      | 3M-5M     | 4 X 56G | QSFP56     | NRZ  | <a href="#">Datasheet</a> |
| <b>200G TO 100G</b>   |           |      |           |           |         |            |      |                           |
| 4 X 56G               | QSFP56    | PAM4 | SHIFT     | 3M-5M     | 4 X 28G | 2 X QSFP28 | NRZ  | <a href="#">Datasheet</a> |
| 4 X 56G               | QSFP56    | PAM4 | SHIFT     | 3M-5M     | 2 X 56G | 2 X QSFP56 | PAM4 | <a href="#">Datasheet</a> |
| 4 X 56G               | QSFP56    | PAM4 | LP SHIFT  | 3M-7M     | 2 X 56G | 2 X QSFP28 | PAM4 | <a href="#">Datasheet</a> |
| <b>100G TO 2X100G</b> |           |      |           |           |         |            |      |                           |
| 4 x 28G               | QSFP28    | NRZ  | LP SWITCH | 0.5M-2.5M | 4 X 28G | 2 X QSFP28 | NRZ  | <a href="#">Datasheet</a> |
| <b>50G TO 2X50G</b>   |           |      |           |           |         |            |      |                           |
| 2 x 28G               | QSFP28    | NRZ  | SWITCH    | 0.5M-2.5M | 2 X 28G | 2 X QSFP28 | NRZ  | <a href="#">Datasheet</a> |
| 2 x 28G               | QSFP28    | NRZ  | LP SWITCH | 0.5M-2.5M | 2 X 28G | 2 X QSFP28 | NRZ  | <a href="#">Datasheet</a> |

For more information visit [www.credosemi.com/hiwire](http://www.credosemi.com/hiwire) or contact us at [hiwire@credosemi.com](mailto:hiwire@credosemi.com)



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