GIGALIGHT Marketing Report

High Performance Computing Interconnect Hardware Solution

Issue 5, 2023

For Air Conditioning Cooling Environment

Ethernet Network Adapters, Transceivers, AOC/DAC, Loopbacks

For Immersion Liquid Cooling Environment

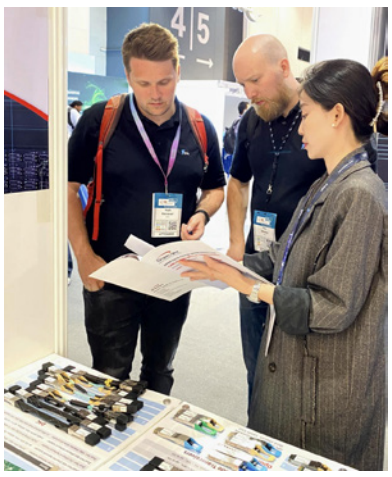
Immersion Liquid Cooling Transceivers, DAC & Extenders

Company News

In May, one of the international conferences leading in the field of high-performance and supercomputing, ISC High Performance, took place at the Hamburg International Exhibition Center in Germany. GIGALIGHT attended the exhibition with high-performance computing interconnect hardware and liquid-cooling interconnect solutions.

At the core of high-performance computing lies parallel computing, and GIGALIGHT is a global leader in the concept of parallel optical interconnect technology and the development of interconnect hardware products. The newly introduced parallel interconnect products at this event include: low-power DAC direct copper cables, multimode optical modules and active optical cables, high-speed parallel single-mode optical fiber modules, immersive liquid cooling series, and server optical network cards, which received widespread acclaim within the industry.

Exhibition Site

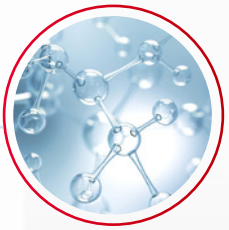


HPC Data Centers Application Scope

Science Field

In areas like meteorology, astronomy, and seismology, simulations of atmospheric and oceanic movements are needed for dynamic research.

Biomedical Field



Processing large amounts of biological and medical data is essential to advance research and innovation.

Manufacturing Industry

High-precision numerical simulations are required to optimize design solutions and reduce experimental costs.

Artificial Intelligence

Tasks such as deep learning, large-scale data analysis, and machine learning are conducted to enhance the effectiveness and performance of AI.

Weather Forecasting

HPC systems assist scientists in weather simulations, enabling more accurate predictions of natural disasters.

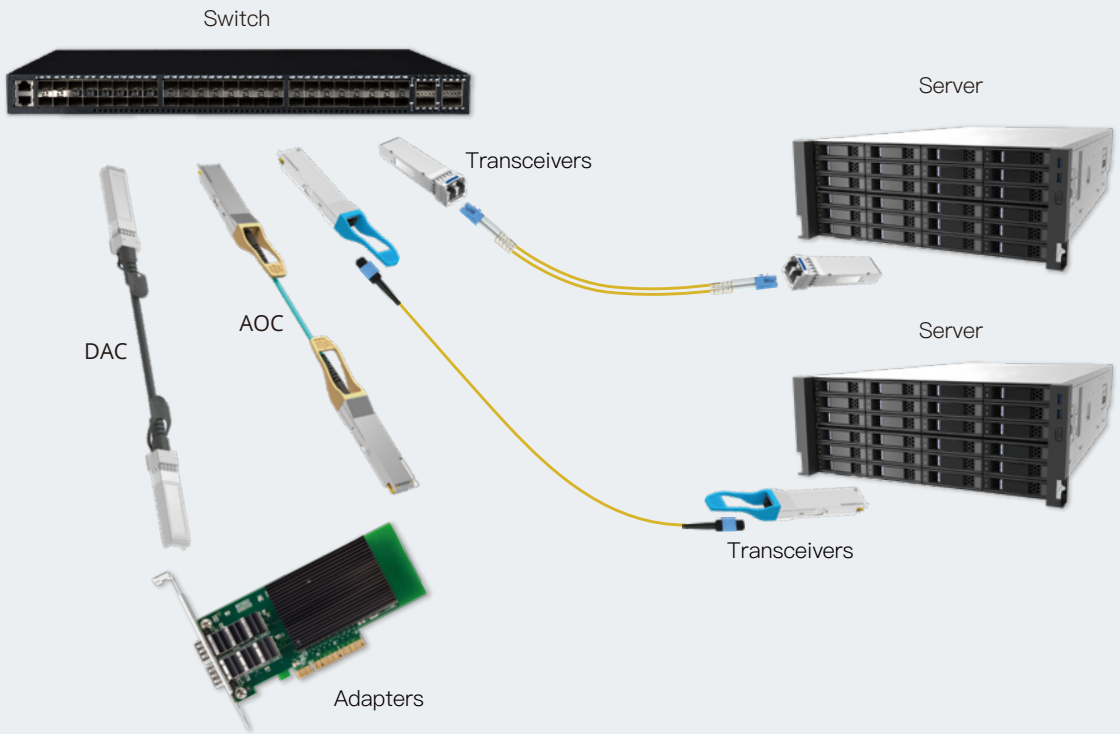
Physics

The applications of HPC aid scientists in studying fundamental particles and cosmology, allowing for a deeper understanding of the universe and our material world.

HPC Data Center Solutions

The computation of large-scale scientific problems and the processing of massive data require enormous clusters of parallel computers. The development of parallel computing, ranging from CPUs to GPUs and NPUs in recent years, is collectively referred to as high-performance computing (HPC).

High-performance interconnect components are essential for connecting devices within HPC clusters. GIGALIGHT has been a pioneer in parallel optical interconnect computing. Since 2013, GIGALIGHT has been focused on the development of high-performance parallel optical modules and interconnect cables. The product series covers rates such as 10G, 25G, 40G, 100G, 200G, 400G, and 800G, supporting the InfiniBand protocol.



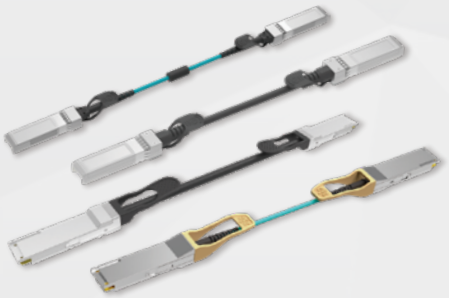
>> *Servers Optical Network Adapter supporting parallel interconnect components designed with Intel and NVIDIA Chips, ranging from 10G to 200G, and Extending towards 400G/800G.*

- Based on Intel and NVIDIA chips
- 10G-100G, PCIE cards and OCP cards
- Single-port/dual-port/quad-port options available
- Widely used in compute and storage-intensive applications like big data analysis, AI, virtualization, and cloud computing
- Offers higher transmission rates, lower latency, and better scalability, reliability, and compatibility.

High-speed parallel optical modules designed based on VCSEL lasers, DML lasers, or silicon photonics technology platform.

- Various transmission rates from 40G to 400G available
- Single MPO optical interface (UPC or APC polished type)
- Industry-leading low power consumption advantage
- Tested in real-world scenarios with switch interconnect networks, plug-and-play
- Surpasses IEEE BER standards, operates reliably in harsh conditions
- Optional industrial-grade operating temperature range, extremely high reliability.

Short-range parallel DAC and AOC interconnect cables designed with low power consumption.

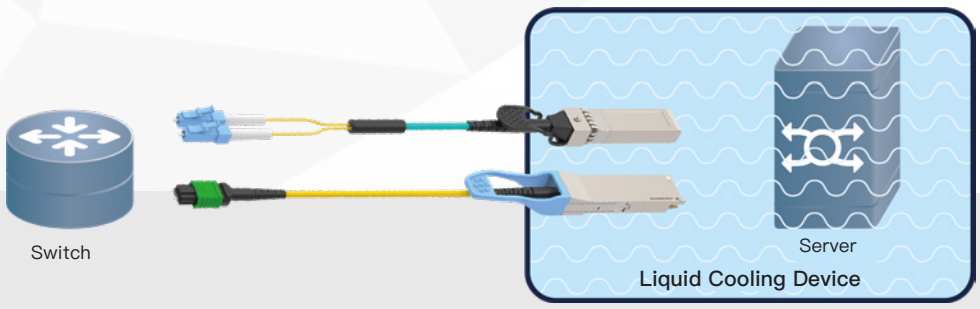


- Various transmission rates from 10G to 800G available
- Industry-leading low power consumption advantage
- Suitable for high-performance supercomputing and high-frequency computing scenarios
- Zero error, low insertion loss.

Electric Loopback Modules supporting system equipment self-loopback testing.

- Hot-pluggable electric loopback modules compliant with MSA standards
- Rates up to 25.78125-425Gbps
- Low power consumption
- Commercial operating temperature range 0°C ~ 70°C
- Powered by 3.3V
- Compliant with RoHS standards.

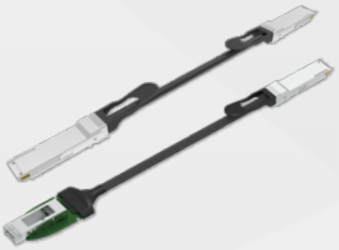
Innovative liquid-cooling interconnect optical modules and solutions.



Liquid Cooling Series Products, featuring superb airtight packaging, operate reliably in 1-meter deep fluoride liquids and mineral oils (certified through long-term customer verification).

Liquid-cooling Optical Modules

- Designed for Immersion-Cooled Data Centers
- Highest Transmission Rate up to 10 to 850Gbps
- Commercial Operating Temperature Range (0~60°C)



Liquid Cooling Extender

- Reduces Operational Costs of Immersion-Cooled Data Centers
- Utilizes 40G/100G/200G QSFP Form Factor
- 30AWG Wire Gauge Copper Cables, up to 50cm in Length
- Easy Deployment, Rapid Connection
- Extremely High Reliability, Simple Structure

Liquid-cooling Data Centers - User Benefits

PUE≤1 – Complies with National Policy Requirements

Stable PUE of 1.05~1.1, Energy Savings, Reduced Carbon Emissions.

50%~70% Reduction in Room Space Requirements

Liquid Cooling Significantly Increases Server Cluster Density, Up to 10 Times Higher than Traditional Air Cooling, Greatly Reducing Required Room Space.

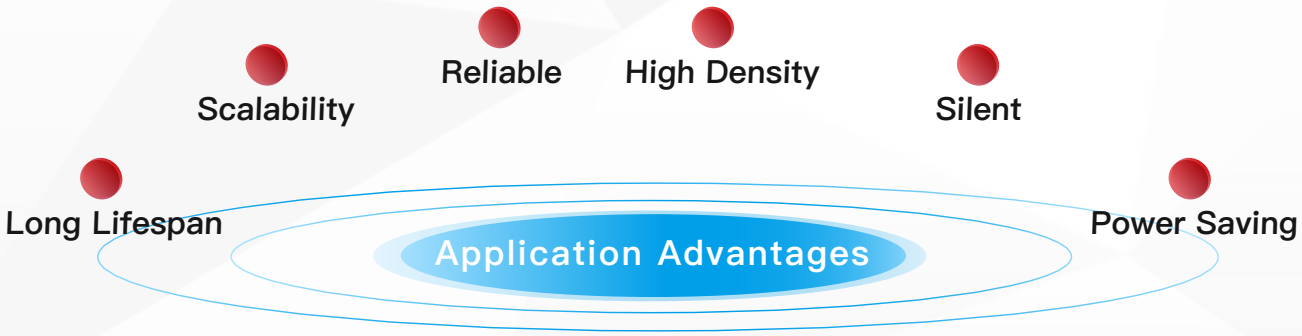
50% Reduction in Electricity Expenditure

Cooling Energy Consumption of IT Equipment Reduced by 90%~95%, IT Equipment Consumption Reduced by 10%~25%.

30% Reduction in Room Equipment Investment

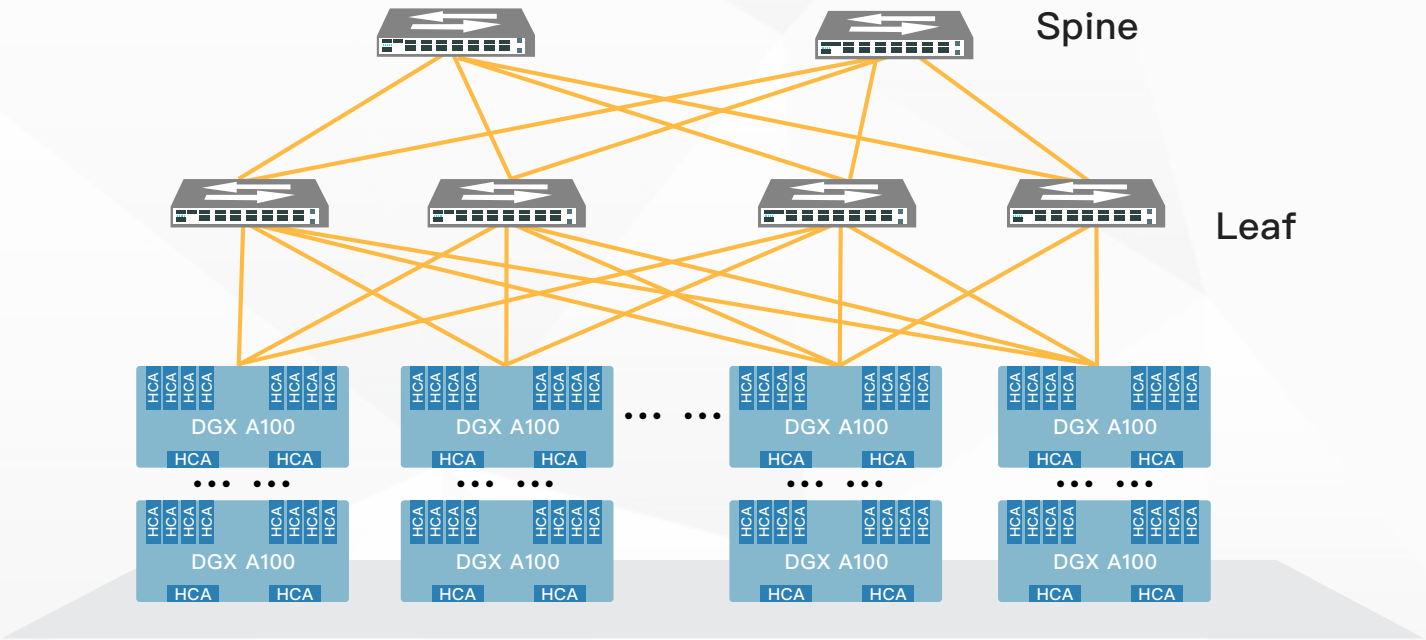
Liquid-Cooled Servers Adapt to Industrial Environments, Eliminating the Need for Additional Equipment Investments like Temperature, Humidity, and Dust Control.

Liquid Cooling Data Center Technology - Application Advantages



Extensive Reading

HPC Application Practice – How many GPUs are needed for the interconnect hardware in an AI data center?



AI Data Center Architecture and Explanation

Application Products:

Each DGX A100 computing system consists of 8 A100 GPUs, with each GPU equipped with a 200G HDR HCA Mellanox network card. This means that each DGX A100 system has 8 200G Mellanox HCA network cards.
The 200G Mellanox HCA network cards are connected to a 200G IB switch (leaf switch).
The 200G IB Mellanox leaf switch is connected to a 400G IB Mellanox spine switch.

Scenario Application:

The 200G Mellanox HCA network cards are connected to a 200G IB switch (leaf switch).

Interconnection Method Introduction:

The leaf switch has a combination of 200G and 400G ports. The downlink is connected to the 200G HDR HCA Mellanox network card via a 400G to 2x 200G branching AOC/DAC connection.

The uplink ports of the leaf switch are 400G NDR, connecting to the 400G IB Mellanox spine switch.

The spine switch solely features 400G NDR IB interfaces.

Key Points:

HCA Card: Host Channel Adapter; Mellanox introduced the Mellanox ConnectX IB InfiniBand Host Channel Adapter (HCA) card, which uses InfiniBand-related protocols.

These cards are usually developed due to different transmission methods. InfiniBand is designed to accelerate connections between servers, storage, and network devices. HCA is the InfiniBand network card, offering characteristics of high bandwidth, low latency, and no packet loss.

Currently, the mainstream is the 200G HDR HCA IB network card, which will be upgraded to the 400G HDR HCA IB network card in the future.

Price Inquiry

If you would like to know the cost of a customized solution for your HPC data center, please reply to this message to get in touch with us. We will tailor the best solution for you.

GigaLight

Open Optical Network Device Explore

For any needs, please contact sales@gigalight.com. Thanks!

https://www.gigalight.com/