



Press Contact: Colleen Seery
Ciena Corporation
+1 (724) 419-5753
pr@ciena.com

Investor Contact: Gregg Lampf
Ciena Corporation
+1 (410) 694-5700
ir@ciena.com

FOR IMMEDIATE RELEASE

Ciena, HyperLight, and McGill University Achieve First 3.2Tb/s, 448Gb/s Per-Lane IMDD 2km Transmission

Successful demonstration paves path to next frontier of data center networking

HANOVER, Md., and CAMBRIDGE, Ma., USA, and MONTREAL, Canada – April 1, 2025 – [Ciena](#) (NYSE: CIEN), [HyperLight Corporation](#), and [McGill University](#) announce the attainment of the first 3.2Tb/s (8×448Gb/s) O-band IMDD transmission over distance, showcasing how data throughput can be doubled utilizing existing fiber infrastructure.

The industry-first milestone was achieved with both 8-WDM and DR8 configurations using Ciena's 224 GBaud DAC to generate the 448Gb/s PAM4 signal and HyperLight's 140 GHz thin-film lithium niobate (TFLN) modulators to transmit the optical signal. The experiment was performed at McGill University using its transmission system and associated digital signal processing software.

The need for higher transmission speeds is being driven by massive AI factories, which require scalable networks that leverage high-speed optics with lower power consumption. To address these requirements, the demonstration shows how transceiver design can be improved using advanced CMOS processes and integrated photonics to reduce power and complexity.

Key Takeaways

- The demonstration was a pioneering scientific achievement, attaining unprecedented link performance for the next major intra-data center networking speed grade
- 400G per-lane optical links were successfully operated in configurations aligning with hyperscalers' stringent requirements:
 - 2km CWDM (FR8)
 - 2km parallel fiber (DR8+)
 - 500m parallel fiber (DR8)

Demonstration Details

- McGill University performed the experiment, including transmit and receive DSP, programming the DAC to generate a 448Gb/s PAM signal, and processing received data at the receiver
- 3nm CMOS-based 224 GBaud DAC from Ciena generated the 448Gb/s PAM4/PAM8 signal (see Figure 1)
- 125 GHz fully packaged golden reference modulators from HyperLight were used for the FR8 demonstration, and an integrated DR8 chip with eight differential-drive modulators with 140 GHz bandwidth—also from HyperLight—was used in the DR8 demonstration (see Figure 1)
- A 113 GHz UXR real-time oscilloscope from [Keysight](#) digitized the received electrical data, sampled at 256 GSamples per second with 10 bits ADC
- Clean open 224 GBaud PAM4 eyes were measured with pre-FEC BER < 6.1E-4, well below the error-correction threshold, yielding rates > 400Gb/s per lane and 3.2Tb/s data transmission in both DR8 and FR8 (see Figure 2)
- Rates of 4.2Tb/s were also achieved utilizing PAM8 signaling

Additional details of the demonstration will be presented on Thursday, April 3, during the post-deadline sessions at [OFC 2025](#) and are available online [here](#).

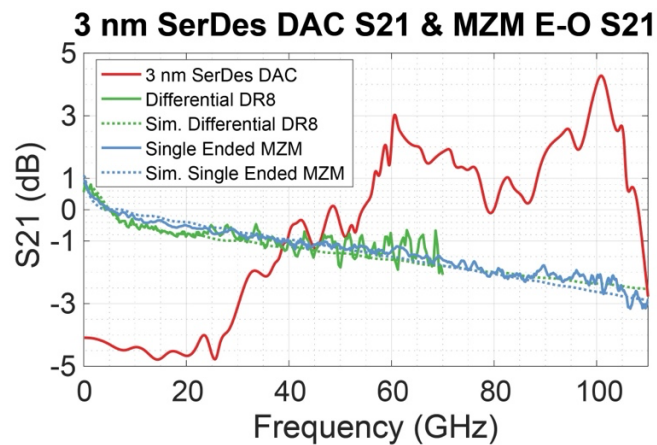
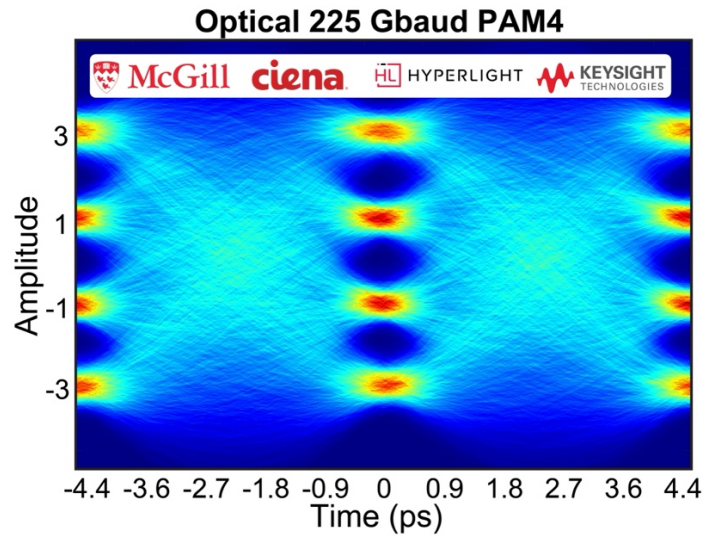


Figure 1: Measured S21 of 3nm SerDes and TFLN modulator, showing sufficient optical bandwidth for 448Gb/s transmission



*Figure 2: 448Gb/s PAM4 optical eye at 224 GBaud, resulting in 3.2Tb/s after error correction
in both FR8 and DR8 implementations*

Executive Comments

“We are leveraging our optical leadership and expertise to address the evolving connectivity needs of cloud and data center operators. These industry-first demonstrations show how our technology can be directly applied to solving emerging connectivity challenges driven by AI workloads inside and around the data center, ensuring greater efficiency, scalability, and performance. We are laying the foundation for accelerating the 448G ecosystem, demonstrating the immense potential at 400G.”

- *Joe Shapiro, Vice President, Product Line Management, Ciena*

“This 448G demonstration marks a defining moment—not just for HyperLight, but for the future of high-speed optics. It highlights the power of our TFLN Chiplet platform, which was meticulously engineered to meet the extreme bandwidth, low drive voltage, and integration demands of next-generation optical links. This is exactly the kind of performance our technology was built for, and we are ready to deliver at scale.”

- *Mian Zhang, CEO, HyperLight*

“McGill University is proud to contribute to this result. Our expertise in optical fiber transmission systems positions us to collaborate with leading industry partners in researching emerging device technologies and transmission system architectures.”

- *David V. Plant, Professor and Canada Research Chair, Department of Electrical and Computer Engineering, McGill University*

“Keysight is proud to participate in this record-breaking transmission demonstration, allowing the industry to accelerate the adoption of 448Gb/s technologies required for power-efficient 3.2Tb/s interfaces for AI-driven future data center networks.”

- *Dr. Joachim Peerlings, Vice President of Network and Data Center Solutions, Keysight Technologies*

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About HyperLight Corporation

Headquartered in Cambridge, Massachusetts, HyperLight delivers high-performance integrated photonics solutions built on its TFLN Chiplet™ platform. By uniquely combining the superior electro-optic properties of thin-film lithium niobate (TFLN) with scalable CMOS-compatible manufacturing processes, HyperLight's solutions provide unprecedented bandwidth, ultra-low loss, and exceptional energy efficiency. These seamlessly integrated solutions empower groundbreaking innovations in AI, data centers, telecommunications, quantum computing, and emerging technologies. For more information, please visit <https://hyperlightcorp.com/>, or follow us on [LinkedIn](#).

About McGill University

McGill University is one of Canada's best-known institutions of higher learning and one of the leading universities in the world. International students from more than 150 countries make up nearly 30% of McGill's student body – the highest proportion of any Canadian research university. McGill was founded in 1821 thanks to a generous bequest by James McGill and, since then, has grown from a small college to a bustling university with 3 campuses, 11 faculties, some 300 programs of study, and more than 37,500 students. For more information, visit <https://www.mcgill.ca/>.

About Ciena

Ciena is the global leader in high-speed connectivity. We build the world's most adaptive networks to support exponential growth in bandwidth demand. By harnessing the power of our networking systems, components, automation software, and services, Ciena revolutionizes data transmission and network management. With unparalleled expertise and innovation, we empower our customers, partners, and communities to thrive in the AI era. For updates on Ciena, follow us on [LinkedIn](#) and [X](#), or visit the [Ciena Insights webpage](#) and [Ciena website](#).

Note to Ciena Investors

You are encouraged to review the [Investors section](#) of our website, where we routinely post press releases, SEC filings, recent news, financial results, and other announcements. From time to time, we exclusively post material information to this website along with other disclosure channels that we use. This press release contains certain forward-looking statements that are based on our current expectations, forecasts, information and assumptions. These statements involve inherent risks and uncertainties. Actual results or outcomes may differ materially from those stated or implied, because of risks and uncertainties, including those detailed in our most recent annual and quarterly reports filed with the SEC. Forward-looking statements include statements regarding our expectations, beliefs, intentions or strategies and can be identified by words such as "anticipate," "believe," "could," "estimate," "expect," "intend," "may," "should," "will," and "would" or similar words. Ciena assumes no obligation to update the information included in this press release, whether as a result of new information, future events or otherwise.