

Gekko Photonics brings real-time chemical intelligence to industrial process monitoring

■ SPECIAL TO THE RBJ

Across chemical manufacturing and process industries, critical production decisions are still guided by delayed laboratory data. In sectors such as specialty chemicals, fertilizers, food ingredients, cosmetics, and pharmaceuticals, samples are pulled from the line, sent for analysis, and returned hours or even days later. By then, a batch may have drifted off spec and the window to intervene has already closed.

This is not a small operational inconvenience. The inability to accurately and continuously measure what is happening inside industrial processes costs manufacturers across the globe trillions of dollars each year in inconsistent quality, inefficient use of materials, and unplanned downtime. Gekko Photonics was created to change that by bringing advanced photonic measurement tools directly into the production environment.



Spectrally product range lineup. (Photo provided by Gekko Photonics)



Gekko Photonics team (from left to right): Bartosz Kawa, Ph.D., Chief Technology Officer; Robert Stachurski, CEO; Karolina Ortowska, Ph.D., Chief Scientific Officer; Dariusz Gajewicz, Chief Operations Officer. (Photo provided by Gekko Photonics)

TURNING SPECTROSCOPY INTO AN INDUSTRIAL TOOL

Headquartered in Wrocław, Poland, Gekko Photonics builds smart photonic systems that allow factories to “see” the chemical composition of their production processes in real time. Its platform is built on Raman spectroscopy, a powerful analytical technique used to identify chemical composition without destroying samples. While widely used in research, Raman has historically been too complex and costly for routine industrial deployment. That’s where Gekko comes in.

“What was previously thought impossible or not economically viable, we are turning into an autonomous industrial product,” says Robert Stachurski, CEO of Gekko Photonics. “Our goal is to give customers advanced chemical insight without requiring them to have deep spectroscopy expertise or large internal R&D teams.”

The company combines proprietary photonic hardware with



Robert Stachurski

AI-driven chemometric software to deliver continuous insight into production processes. Instead of relying on intermittent lab testing, manufacturers can monitor reactions as they happen—directly in reactors, pipelines, or production lines.

ENGINEERING A COMPLETE SOLUTION

Gekko Photonics positions itself as a full-stack solution partner. Its Spectrally X1 family of Raman analyzers—designed for inline, at-line, laboratory, and portable use—enables manufacturers to measure chemical composition in real time and feed that data directly into plant automation and control systems.

The company takes an engineering-first approach, configuring each deployment to a customer's specific process. That includes tailoring probe design, spectral range, and chemometric models to match the chemistry and operating environment—ensuring the system delivers actionable data, not just raw signals.

“We want to help companies move from reactive quality control to proactive process optimization,” says Stachurski. “That means better control over production, more consistent output, and more sustainable industrial operations.”

By bringing hardware, software, analytics, and system integration together under one platform, Gekko gives customers a single partner responsible for performance from end to end. This approach aligns with a broader shift across the chemical and process industries, where both economic and environmental pressures are pushing manufacturers to improve efficiency and make



Spectrally At-line/Lab. (Photo provided by Gekko Photonics)

faster, data-informed production decisions. In these industries, even small improvements in yield, purity, or cycle time can translate into significant financial gains.

Though still an emerging company, Gekko has already validated its approach with global industrial customers. These early deployments demonstrate that real-time chemical monitoring is not just technically feasible, but commercially valuable.

SCALING INTO THE U.S. THROUGH LUMINATE

To accelerate its expansion into North America, Gekko Photonics joined Luminate NY, the world's largest accelerator for optics, photonics, and imaging technologies.

“We see Luminate as a springboard for building a long-term presence in the United States,” says Stachurski. “It’s helping us refine our positioning, understand customer expectations, and build relationships with partners and investors.”

Rochester's deep-rooted photonics ecosystem has proven especially valuable. The region offers access to specialized talent, research institutions, and supply chain capabilities aligned with Gekko's technology.

“Being in a region where photonics is part of the industrial and academic DNA allows us to think bigger about commercialization and partnerships,” Stachurski adds.

Gekko Photonics will take that momentum to Luminate Finals on September 30, where it will compete for follow-on funding, including the \$1M Company of the Year investment. The event, supported by Empire State Development's Finger Lakes Forward Upstate Revitalization Initiative, will award more than \$2M across companies in cohort 9.

For Gekko, that funding would accelerate its plans—supporting product refinement, additional industrial pilots, and growth in sales and application engineering while strengthening its ties to the Rochester region.