

OPTO 22

2022
ENABLING
TECHNOLOGY
LEADER

NORTH AMERICAN
GLOBAL IIoT EDGE CONTROL
SOLUTIONS INDUSTRY

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Opto 22 excels in many of the criteria in the IIoT edge control solutions space.

AWARD CRITERIA	
<i>Technology Leverage</i>	<i>Customer Impact</i>
Commitment to Innovation	Price/Performance Value
Commitment to Creativity	Customer Purchase Experience
Stage Gate Efficiency	Customer Ownership Experience
Commercialization Success	Customer Service Experience
Application Diversity	Brand Equity

A Market Snapshot

Industry 4.0 and widespread digital transformation have changed the industrial automation and manufacturing landscape. The advent and continuous development of disruptive state-of-the-art technologies, such as Industrial Internet of Things (IIoT) connectivity, edge intelligence, Big Data analytics, and machine learning, have improved the collection, transmission, storage, and processing of massive data volumes. This innovation wave has delivered intelligent and actionable insights, thereby

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**- Samantha Fisher,
Best Practices Research Analyst**

boosting production efficiency, quality, reliability, safety, profitability, and sustainability to unprecedented levels. As a result, in 2021, the global digital industrial platforms market generated revenue of \$5.8 billion.¹ However, existing challenges, such as workforce technology gaps, backwards incompatibility, inexperience, security concerns, and regulatory pressures, continue to hinder adoption. Frost & Sullivan estimates the digital industrial platforms market will reach \$14.21 billion in 2026, with a compound annual growth rate of about 19.6% from 2021 to 2026.²

¹ Global Digital Industrial Platforms Growth Opportunities (Frost & Sullivan March 2022)

² Ibid.

Innovation Excellence: A Trailblazer's Path

Founded in 1974 by engineers and headquartered in Temecula, California, Opto 22 is a developer and manufacturer of products for industrial automation and IIoT applications, such as controllers, input/output (I/O), solid-state relays, and software products that connect industrial devices to networks and computers. Today, almost 50 years later, the company remains privately held and run by engineers.

Opto 22's products and solutions are highly recognized in the industry for their quality, reliability, ease of use, and innovation, combining real-time I/O sensing and control with connectivity to a broad diversity of devices, applications, and services, such as field sensors, programmable logic controllers (PLCs), databases, software applications, and cloud services. All of this without the need for industrial computers or middleware.

Opto 22 has a strong commitment to open-source technologies and industry standards, from both the information technology (IT) and operational technology (OT) worlds. Not only can its products run on non-proprietary communication protocols, such as Ethernet, Message Queuing Telemetry Transport (MQTT), and Internet protocol, among others, but also the company has a long, proven history of promoting industry standards, like developing Optomux in 1982, starting the OPC Task Force in 1985, and introducing the first commercial Ethernet-based I/O unit in 1998.

The company revolutionized various industries, such as IIoT edge control and remote I/O connectivity, with best-in-class technology, such as *groov* EPIC (EPIC) and *groov* RIO (RIO).

Backed by world-class subject matter experts, Opto 22 developed EPIC (which stands for Edge Programmable Industrial Controller) over several years before its 2018 product launch. The company refined its holistic approach to industrial control systems, building on its innovation excellence to deliver an industry-first edge programmable industrial control system that delivers ease of use, cost efficiency, high security, and powerful performance. Designed and purpose-built to meet the needs of automation engineers, EPIC's hardware offers a state-of-the-art quad-core processor and guaranteed-for-life I/O, enabling key use cases, such as remote monitoring, process control, data acquisition and processing, and IIoT. Opto 22's goal with EPIC was to create a cohesive system that offered significant features, such as streamlined data exchange with other systems, mobile/web visualization, edge computing, ATEX compliance, and the ability to perform in extreme and hazardous conditions (-20 °C to 70 °C operating temperature range). The company combined these features with real-time control and industrial I/O, resulting in an easy-to-use, secure, and high-performance control system that outperforms the competition in holistic agility, versatility, and performance. Opto 22's strong intellectual property portfolio upholds its technology, placing a high barrier to entry for emerging competitors.

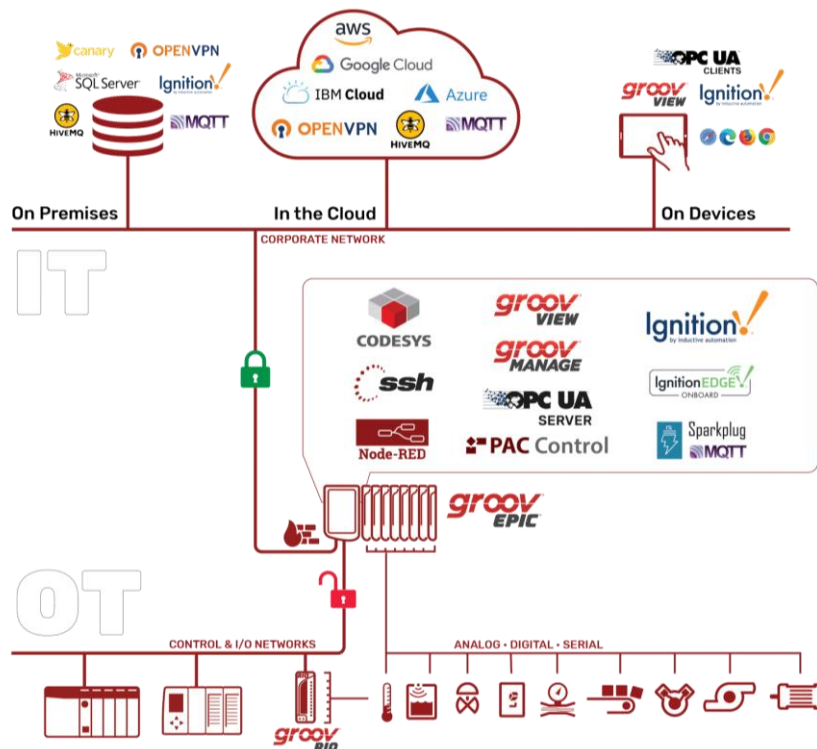


groov EPIC - Source: Opto 22

With its foundational EPIC technology in place, the company assembled a comprehensive product portfolio purpose-built to bridge industry gaps. Opto 22's portfolio includes RIO, a revolutionary I/O field-to-cloud, standalone connectivity solution introduced in 2020 that offers 200,000 unique, software-configurable I/O combinations in a single, compact, industrial package with web-based configuration, commissioning, and built-in IIoT software. The company designed RIO to communicate data between devices (field, on-premises, and cloud) and destinations as an edge I/O unit. Like EPIC, it is ATEX-compliant and can perform in extreme and hazardous conditions (-20 °C to 70 °C operating temperature range). RIO connects to and acquires data directly from sensors, equipment, and systems, making the information readily available for on-premises or cloud applications, databases, and other software, leveraging Node-RED. The device also acts as traditional remote I/O, configuring the I/O through the user's control program. Additionally, Opto 22 designed a RIO model for customers leveraging Ignition from Inductive Automation (GRV-R7-MM2001-10), which is a 10-channel, multi-signal, multifunction remote I/O unit that has two switched Gigabit Ethernet interfaces in its communication processor.³



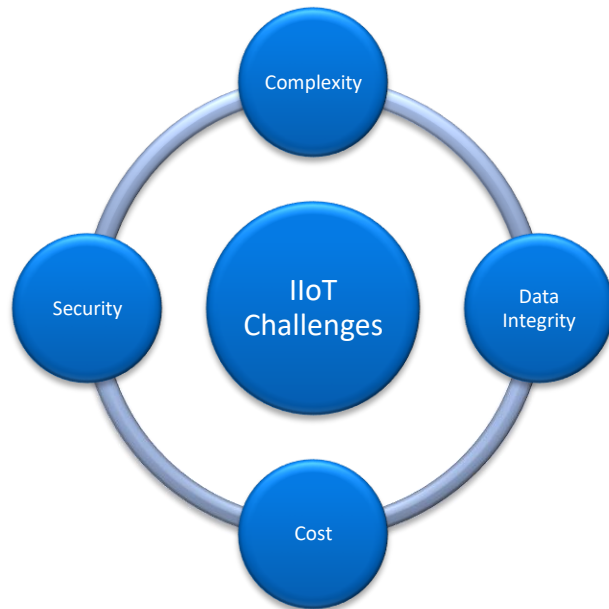
groov RIO - Source: Opto 22



groov technology architecture - Source: Opto 22

³ Opto 22. "groov RIO®." Data Sheet. Accessed 1 June 2022. https://documents.opto22.com/2317_groov_RIO_Data_Sheet.pdf

The *groov* technology has the capability to solve one of the most challenging aspects of IIoT: how to collect data from the edge of the network and make it available to the software that consumes it and people that use it, overcoming the intrinsic complexity, security, integrity, and cost issues.



Source: Frost & Sullivan

- A sole unit of EPIC or RIO replaces all the middleware needed to translate and convert data from OT to IT protocols between the field devices (sensors, actuators) and the cloud/on-premise applications (e.g. PLCs, OPC servers, computers, firewalls, gateways, etc.), managing communication security through encryption and user authentication.
- EPIC and RIO help keep devices and data integrity secured through a plethora of options, which include user authentication, data encryption, configurable device firewall, virtual private network access, and MQTT’s pub/sub data communication method.

Most of Opto 22 solutions include technologies created and developed by other companies, which also believe in the need for open standards and interoperability for meeting today’s industrial automation needs. The list of Technology Partners includes Inductive Automation, Canary, Cirrus Link, Sepasoft, Codesys, HiveMQ, Node-RED, and Kepware.

Customers use Opto 22’S EPIC and RIO across business verticals, achieving broader organizational objectives in various industries. Frost & Sullivan’s research identifies Opto 22 as a leading partner leveraging cutting-edge methodologies to advance the IIoT edge control solutions market.

A Customer-centric Approach Driving Unmatched Client Experience

With its customer-centric corporate philosophy, Opto 22 operates on the central tenet that its success depends on customer satisfaction. This philosophy permeates the company’s daily practices. Opto 22 understands that the customer experience starts with the initial contact. Thus, the first impression will shape the customer’s perception of the company going forward. To this end, Opto 22 delivers end-to-end transparency throughout the entire customer journey, which is a breath of fresh air in the industry since traditional methods do not offer this level of visibility.

Opto 22 reduces the friction commonly associated with the purchase process, ensuring everything the company does is at no cost, regardless if it is pre-sales, application engineering, complex problem resolution, or tech support. On the customer service front, Opto 22 ensures rapid turnaround for problems with an online pop-up chat window that connects a user with a real person, not a bot.

Customers receive best-in-class, comprehensive support at no additional charge. The company offers almost 100 factory-authorized, certified, and trained partners globally. This regional availability means international clients are not restricted to office hours in one time zone; Opto 22 offers partners in local areas for client convenience. In terms of product support, Opto 22 designs products for the long term, provides upgrade paths, and keeps manufacturing older products until their required components are no longer located. Additionally, the company's website contains critical information and resources that enable many customers to resolve problems on their own.

Opto 22 meets with clients to assess their specific needs and develop tailored solutions with roadmaps for seamless execution. This foundational approach establishes ongoing trust with customers for long-lasting relationships extending throughout the product lifecycle.

Earning Clients' Trust and Loyalty through Customer-centric Practices

Since its inception, Opto 22's sterling reputation and customer-centric framework led to its coveted preferred partner status. Over the years, it added a range of new customers to its established base. The company has grown its global footprint significantly, with products adopted in the Asia-Pacific, Europe, and Latin America, resulting in significant 2022 revenue earnings of \$60 million. It established partnerships with key companies early, enabling the partners to transition from electrical components to automation and IIoT. The company demonstrated significant resilience under the COVID-19 headwinds by avoiding the "just in time" philosophy, ensuring it always has hundreds of products in stock to adjust to market demands. This approach helped the company navigate the supply chain instability and maintain its market position. Even if Opto 22's suppliers do not have a product, the

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***- Sebastián Trolli,
Senior Industry Analyst***

company can supply it directly. This strategy was instrumental in the pandemic when Opto 22 ran a skeleton crew to ensure product orders continued to ship promptly.

Additionally, as more industries transition to sustainable practices, Opto 22 has increased its product recycling initiatives and factory material recycling, replaced grass with drought-tolerant landscaping, and continues to reduce operational energy usage. Beginning in 2006, the company set

out to reduce its energy consumption while maintaining a comfortable indoor climate. Leveraging its control and monitoring products, the company

made irrigation and heating, ventilating, and air conditioning systems more efficient, maximized natural sunlight usage for indoor lighting, and minimized heat absorption through roofs and windows. By the following year, the company had reduced its power consumption by nearly 30%. In 2022, it continues to move forward with sustainability. The company acts as a helper for customers focused on leveraging alternative energy and reducing consumption, making Opto 22 an advocate for sustainability.

Frost & Sullivan believes the company is well-positioned to drive the IIoT edge control solutions space into its next growth phase, capturing market share and sustaining its leadership in the coming years.

Conclusion

Technology integration is a critical success factor for the Industrial Internet of Things (IIoT) edge control solutions industry. Yet, with many options available, market stakeholders need to leverage the most appropriate and best technology-based solutions to optimize their market impact. With its *groov* EPIC and *groov* RIO technology, Opto 22 delivers revolutionary remote input/output (I/O) connectivity and industrial controller capabilities that supersede much of the competition. The company offers 200,000 unique, software-configurable I/O combinations in a single, compact industrial package with web-based configuration, commissioning, and integrated IIoT software. Opto 22 stands out from competitors based on its commitment to innovation, creativity, and ability to launch new solutions with far-reaching impact and applications. The company pairs its technology focus with customer-centric values, thus earning a solid reputation in the IIoT edge I/O and control market.

For its strong overall performance, Opto 22 is recognized with Frost & Sullivan's 2022 Global Enabling Technology Leadership Award in the IIoT edge control solutions industry.

What You Need to Know about the Enabling Technology Leadership Recognition

Frost & Sullivan's Enabling Technology Leadership Award recognizes the company that applies its technology in new ways to improve existing products and services and elevate the customer experience.

Best Practices Award Analysis

For the Enabling Technology Leadership Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Technology Leverage

Commitment to Innovation: Continuous emerging technology adoption and creation enables new product development and enhances product performance

Commitment to Creativity: Company leverages technology advancements to push the limits of form and function in the pursuit of white space innovation

Stage Gate Efficiency: Technology adoption enhances the stage gate process for launching new products and solutions

Commercialization Success: Company displays a proven track record of taking new technologies to market with a high success rate

Application Diversity: Company develops and/or integrates technology that serves multiple applications and multiple environments

Customer Impact

Price/Performance Value: Products or services provide the best value for the price compared to similar market offerings

Customer Purchase Experience: Quality of the purchase experience assures customers that they are buying the optimal solution for addressing their unique needs and constraints

Customer Ownership Experience: Customers proudly own the company's product or service and have a positive experience throughout the life of the product or service

Customer Service Experience: Customer service is accessible, fast, stress-free, and high quality

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty

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- **Growth Pipeline:** Continuous Flow of Growth Opportunities
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- **ROI & Margin:** Implementation Excellence
- **Transformational Growth:** Industry Leadership



The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.

Analytical Perspectives:

- **Mega Trend (MT)**
- **Business Model (BM)**
- **Technology (TE)**
- **Industries (IN)**
- **Customer (CU)**
- **Geographies (GE)**

