

Global Absolute Optical Encoders Market 2026 by Manufacturers, Regions, Type and Application, Forecast to 2032

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Abstracts

According to our (Global Info Research) latest study, the global Absolute Optical Encoders market size was valued at US\$ 645 million in 2025 and is forecast to a readjusted size of US\$ 941 million by 2032 with a CAGR of 5.4% during review period.

Optical encoders are position and motion feedback sensors that turn mechanical movement into electrical signals by using light. In a typical optical encoder, a light source (often an LED) shines through or reflects off a patterned scale (a code disk for rotary motion, or a scale strip for linear motion). A photodetector reads how the light changes as the pattern moves, and electronics convert this into signals that a controller can use to know position, speed, and direction. This is why optical encoders are a core part of many motion systems: without feedback, motors and axes cannot reliably hit the right location, keep stable speed, or correct errors in real time. Renishaw describes optical encoders as a scale + readhead system where a light source and photodetector move past scale lines to generate an electrical signal for a motion control system.

A key way the market is segmented is incremental vs. absolute. Incremental encoders output pulses as motion occurs; the controller counts pulses to infer movement and direction. They are widely used for speed control, relative positioning, and cost-sensitive systems. Absolute encoders output a unique position value (or can report it on demand), so the system can know the position immediately even after power loss, which matters for safety, multi-axis coordination, and high-value equipment. Manufacturers commonly explain this split and also the further split of single-turn vs multi-turn absolute encoders: single-turn reports position within one revolution, while multi-turn also tracks the number of revolutions so it can report position across multiple turns.

In 2025, global Absolute Optical Encoders production reached approximately 6129 K Units, with an average global market price of around US\$ 102.2 per unit. The global single-line production capacity ranges from 100 to 200 K Units per year. The industry's gross profit margin is approximately 30%-40%.

One major trend in the optical encoder market is the continued push toward higher accuracy and better control of error sources in precision manufacturing. This is especially visible in CNC machining, precision grinding, and high-end motion stages. The reason is straightforward: as customers demand tighter tolerances and higher throughput, manufacturers try to reduce scrap, reduce rework, and shorten cycle time. Linear encoders support this by measuring actual axis position and helping controls compensate for mechanical and thermal effects. HEIDENHAIN's materials emphasize this "error elimination" value proposition for linear encoders in machine tools. The trend is not only "more encoders," but also a shift toward using encoders in more axes and using better encoder systems in higher-value machines.

A second major trend is the move from "simple signal output" to smart, networked encoders that support modern industrial communication and diagnostics. In older architectures, encoders often output basic quadrature pulses (A/B/Z) or a simple serial position signal. In newer architectures, encoders increasingly support real-time Ethernet and "Industry 4.0" style connectivity, so systems can do easier commissioning, parameter management, diagnostics, and predictive maintenance.

A third trend is demand growth in robotics and motion platforms beyond traditional factory robots. Warehouses and logistics are expanding the use of AGVs/AMRs and automated material handling; service robots (in cleaning and transport) are also growing. IFR press releases note rising sales of professional service robots and describe labor shortages and productivity needs as drivers in some segments. These systems often require reliable position feedback for wheels, lifts, steering modules, and actuator joints, and they run in mixed environments where robustness and stable feedback matter. In many cases, optical encoders compete with magnetic sensing, but optical systems remain attractive where high resolution and stable measurement are important for smooth control.

Another demand driver is the growth of electronics and semiconductor-related manufacturing equipment, which relies on precise motion (linear stages, wafer handling, inspection equipment). Even when this equipment uses specialized metrology, encoders still play a key role in positioning loops and motion repeatability. The market

driver here is that electronics manufacturing continues to push for smaller feature sizes, higher throughput, and more automation, which increases the value of precision feedback components. In addition, medical devices, lab automation, and high-end printing/inspection equipment often require accurate, repeatable movement and benefit from optical encoder feedback.

This report is a detailed and comprehensive analysis for global Absolute Optical Encoders market. Both quantitative and qualitative analyses are presented by manufacturers, by region & country, by Type and by Application. As the market is constantly changing, this report explores the competition, supply and demand trends, as well as key factors that contribute to its changing demands across many markets. Company profiles and product examples of selected competitors, along with market share estimates of some of the selected leaders for the year 2025, are provided.

Key Features:

Global Absolute Optical Encoders market size and forecasts, in consumption value (\$ Million), sales quantity (K Units), and average selling prices (US\$/Unit), 2021-2032

Global Absolute Optical Encoders market size and forecasts by region and country, in consumption value (\$ Million), sales quantity (K Units), and average selling prices (US\$/Unit), 2021-2032

Global Absolute Optical Encoders market size and forecasts, by Type and by Application, in consumption value (\$ Million), sales quantity (K Units), and average selling prices (US\$/Unit), 2021-2032

Global Absolute Optical Encoders market shares of main players, shipments in revenue (\$ Million), sales quantity (K Units), and ASP (US\$/Unit), 2021-2026

The Primary Objectives in This Report Are:

To determine the size of the total market opportunity of global and key countries

To assess the growth potential for Absolute Optical Encoders

To forecast future growth in each product and end-use market

To assess competitive factors affecting the marketplace

This report profiles key players in the global Absolute Optical Encoders market based on the following parameters - company overview, sales quantity, revenue, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Broadcom, BEI Sensors, Renishaw, Dynapar, Baumer Group, Tamagawa, Allied Motion, EPC, CUI, Omron, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Market Segmentation

Absolute Optical Encoders market is split by Type and by Application. For the period 2021-2032, the growth among segments provides accurate calculations and forecasts for consumption value by Type, and by Application in terms of volume and value. This analysis can help you expand your business by targeting qualified niche markets.

Market segment by Type

Single-turn Encoder

Multi-turn Encoder

Market segment by Measurement Type

Rotary Optical Encoders

Linear Optical Encoders

Market segment by Mechanical Construction

Shaft Encoders

Hollow-Shaft Encoders

Ring Encoders

Others

Market segment by Optical Principle

Transmissive

Reflective

Interferential

Market segment by Application

Healthcare

Machine Tool

Consumer Electronics

Assembly Equipment

Others

Major players covered

Broadcom

BEI Sensors

Renishaw

Dynapar

Baumer Group

Tamagawa

Allied Motion

EPC

CUI

Omron

Heidenhain

Bourns

Grayhill

Gurley

Honeywell

Honest Sensor Corporation

HONTKO

Yuheng Optics

Market segment by region, regional analysis covers

North America (United States, Canada, and Mexico)

Europe (Germany, France, United Kingdom, Russia, Italy, and Rest of Europe)

Asia-Pacific (China, Japan, Korea, India, Southeast Asia, and Australia)

South America (Brazil, Argentina, Colombia, and Rest of South America)

Middle East & Africa (Saudi Arabia, UAE, Egypt, South Africa, and Rest of Middle East & Africa)

The content of the study subjects, includes a total of 15 chapters:

Chapter 1, to describe Absolute Optical Encoders product scope, market overview, market estimation caveats and base year.

Chapter 2, to profile the top manufacturers of Absolute Optical Encoders, with price, sales quantity, revenue, and global market share of Absolute Optical Encoders from 2021 to 2026.

Chapter 3, the Absolute Optical Encoders competitive situation, sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the Absolute Optical Encoders breakdown data are shown at the regional level, to show the sales quantity, consumption value, and growth by regions, from 2021 to 2032.

Chapter 5 and 6, to segment the sales by Type and by Application, with sales market share and growth rate by Type, by Application, from 2021 to 2032.

Chapter 7, 8, 9, 10 and 11, to break the sales data at the country level, with sales quantity, consumption value, and market share for key countries in the world, from 2021 to 2026. and Absolute Optical Encoders market forecast, by regions, by Type, and by Application, with sales and revenue, from 2027 to 2032.

Chapter 12, market dynamics, drivers, restraints, trends, and Porters Five Forces analysis.

Chapter 13, the key raw materials and key suppliers, and industry chain of Absolute Optical Encoders.

Chapter 14 and 15, to describe Absolute Optical Encoders sales channel, distributors, customers, research findings and conclusion.

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