

Optical Communication Module Soldering Machine



AI Overview

Laser soldering machines are the preferred solution for high-precision, non-contact soldering of optical communication modules, offering micron-level accuracy, thermal control, and automation for high-yield production.

Overview Optical communication modules, such as TOSA (Transmitter Optical Sub-Assembly) and ROSA (Receiver Optical Sub-Assembly), require precise soldering due to their sensitivity and high-density layouts. Laser soldering machines use a focused laser beam to heat and melt solder, enabling non-contact joining that minimizes thermal stress and preserves the integrity of delicate optical components. These machines are widely applied in telecommunications, 5G communication, medical devices, aerospace, and consumer electronics.

Key Features

- Non-contact heating:** Reduces heat diffusion and prevents damage to heat-sensitive components.
- High precision:** Micron-level accuracy ensures reliable solder joints and alignment of optical elements.
- Automated operation:** Equipped with robotic arms, CNC systems, or dual-station platforms for high throughput and consistent results.
- Temperature control:** Closed-loop feedback systems monitor and adjust laser power in real time, maintaining optimal soldering conditions.
- Versatile soldering:** Capable of soldering multiple points simultaneously, including complex 3D geometries, using techniques like laser through-hole soldering and solderjet bumping.
- High yield and efficiency:** Rapid soldering cycles (e.g., five points in 3–4 seconds) improve production efficiency while maintaining quality.

Applications

- Optical communication modules:** Ensures precise assembly of TOSA and ROSA components.
- 5G communication devices:** Soldering of circulators, isolators, and filters with dense pitch layouts.
- 3C electronics and automotive electronics:** High-precision soldering for cameras, sensors, and other compact modules.

Advantages R...

Article Content

Soldering

The parts to be joined can be metallized with solder and solder-aiding layers by DC-magnetron sputtering. The coating technology of all layers takes place in one

HIGH-VOLUME LASER SOLDERING MACHINE

The SB² ® – SMs Quantum is a machine for automated sequential laser soldering, catering to a variety of different microelectronic devices, especially dedicated for

Laser Soldering Process in 5G Communication and Optical Module ...

First, let's explore the application of laser soldering technology in optical module welding. As a high-precision welding equipment, laser soldering machines can achieve precise soldering of internal

Joining technologies in optical and micro assembly

Bonding and laser soldering for harsh operating conditions Joining technologies in optical and micro assembly have a critical influence on the accuracy and stability

Use of soldering technologies in fiber assembly

Fraunhofer ILT has been able to demonstrate the use of this innovative soldering technology in fiber assembly. Optical measurements show that in polarization-maintaining fibers, the thermally induced

Laser Soldering in Optical Communication

As the information technology sector rapidly evolves, the optical communication market continues to expand, driving the demand for more

Joining technologies in optical and micro assembly

In addition to the analytical and FEM-based simulation and optimization of joints, Fraunhofer IOF also conducts fundamental research into bonding and laser beam soldering technologies and adapts

Laser Soldering in Optical Communication

Laser soldering represents a significant advancement in the optical communication industry, offering unparalleled precision, efficiency, and reliability.

Laser soldering-QUICK INTELLIGENT EQUIPMENT

For the pain point of high difficulty in soldering the fiber core, bracket, shield and FPC of data cable, the company takes the lead in providing perfect on-line laser

Optical module

An optical module is a typically hot-pluggable optical transceiver used in high-bandwidth data communications applications. Optical modules typically have an electrical interface on the side that

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Review of solder joint vision inspection for industrial applications

Review of the current methodologies and achievements in solder joint vision inspection is performed by following these four steps: (i) firstly, a search is performed to systematically gather the most relevant

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Automating Optoelectronics Soldering

The main purpose of this research project is to identify low-cost, high-yield, data-driven processes such as laser selective soldering and infra-red (IR) soldering to attach non-reflowable optoelectronic

Laser Soldering Process in 5G Communication and Optical Module ...

With the continuous advancement of 5G communicated technology, the demand for high-quality optical modules is also increasing. In 5G communication and optical module processing, it is necessary to

ACI Technologies, Inc

To reduce the likelihood of heat damage, the fiber optic module is added after the other components are processed. To increase reliability and reproducibility, automated soldering process, such as selective

Discussion: Application of laser soldering machine in optical ...

From the early wired communication to today's wireless mobile network communication, the development of optical communication modules can be said to be indispensable.

Review of solder joint vision inspection for industrial applications

This paper provides a review of solder joints vision inspection, covering key stages including image acquisition, image enhancement, localization and segmentation and feature

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