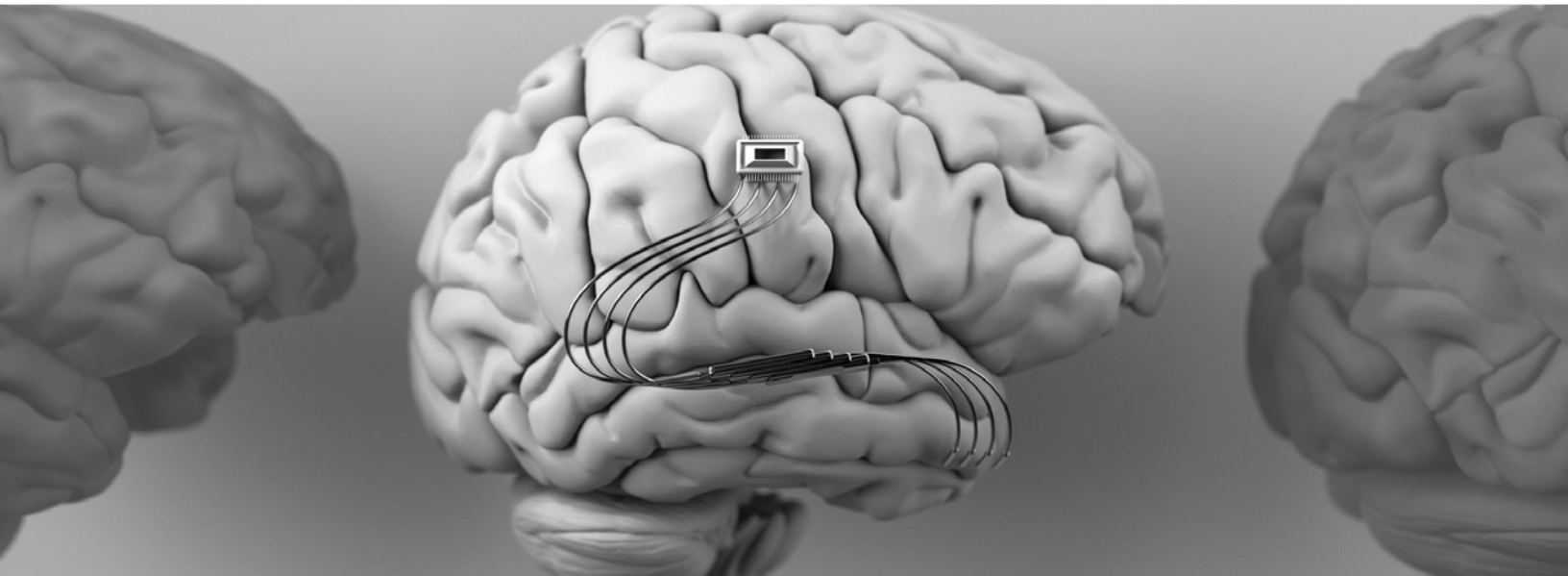




BRAIN COMPUTER INTERFACE (BCI) ELECTRODE MANUFACTURING

An industry-leading BCI manufacturer needed a precision laser micromachining solution to produce high-density neural microelectrode arrays.

THEIR GOAL: Produce excellent signal-to-noise performance & increased interface channel count.



CHALLENGE

Use an advanced laser process to machine intricate micrometer-sized features in platinum iridium. This required:

- ◆ High aspect ratio laser micromachining to create double-digit micron scale features on a millimeter scale electrode within a compact array
- ◆ Low dynamic tracking error motion while maintaining tight control of laser spot position & fluence during machining to produce very fine 3D features
- ◆ A highly flexible programming environment for planning & executing challenging trajectories with 5-axis motion

SOLUTION

Aerotech engineered a successful solution by leveraging:

- ◆ An AGV5D 5-axis laser micromachining precession scanner for optimum combination of flexibility & speed when machining individual microelectrodes within the array
- ◆ Integration with a motion control platform using linear amplifiers to enable tight control of all laser scan head axes
- ◆ A fiber-optic motion bus for high-speed communications & coordination of the laser to the part



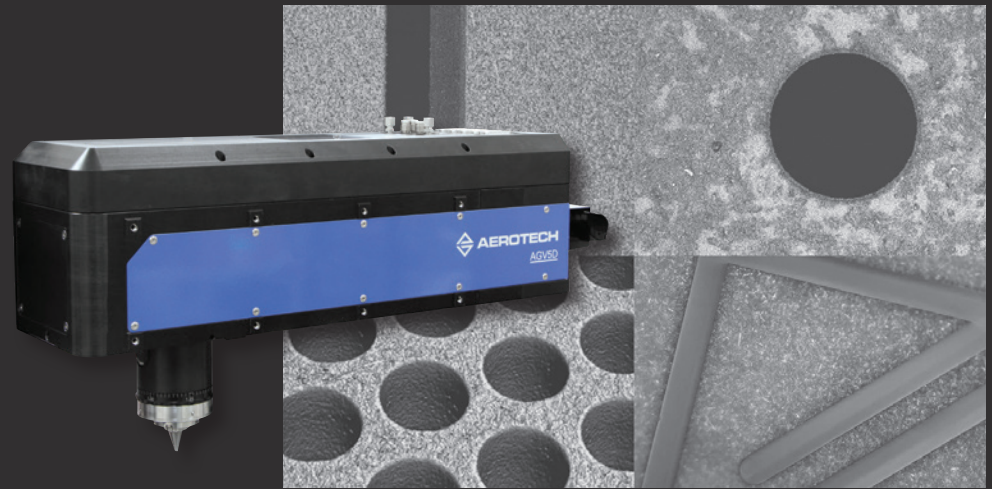
LEARN MORE

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The Best in Laser Processing Precision

The AGV5D 5-axis laser micromachining precision scanner is the fastest, most flexible and exacting solution for generating precise holes, contoured slots and other geometries with fully defined cross sections. Paired with our Automation1 control software, it controls your entire precision micromachining process—the laser, the scanning head and positioning of the workpiece.



Control Top Performance at Light Speed

Aerotech's motion control platform leverages HyperWire®, a proprietary fiber-optic motion bus that delivers the fastest motion and laser scan head performance in the world. With HyperWire, laser scan head trajectories are executed at 100 kHz—faster than any conventional automation and laser scan head solutions on the market. Higher speeds allow for greater precision, improved quality and higher throughput when micromachining parts with true determinism.

High-performance Linear Amplifiers

The GL4 and XL4 high-performance linear amplifiers eliminate non-linearities common to PWM amplifiers. They offer deterministic behavior, auto-identification and easy software setup. Advanced features—including full state feed-forward, 200 kHz servo rates and look-ahead-based velocity control—allow you to achieve industry-leading settling times, long-term thermal stability and sub-micron-level tracking accuracy.

