

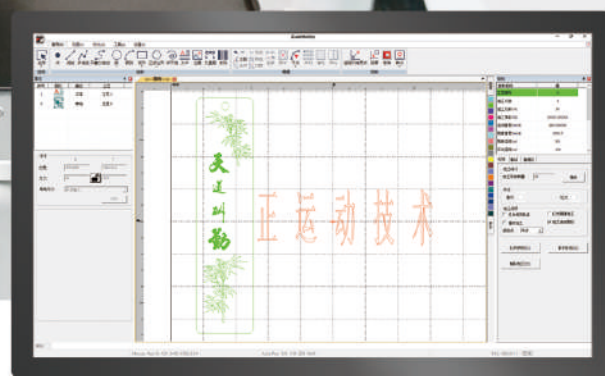
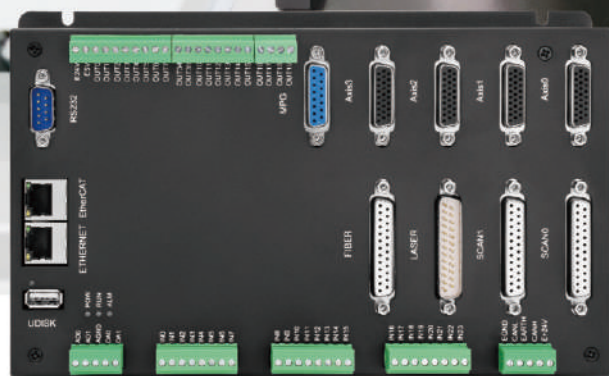
## Open Laser Galvanometer Motion Controller | ZMC408SCAN -- V22

Integration of Scan & Laser & Axis Control | 2D / 3D / Closed-Loop Scan

Linkage Interpolation of Scan & Motion Axis | 1D/2D/3D PSO

Multi - Laser Types | Multi - Scan - Correction | Be Customized

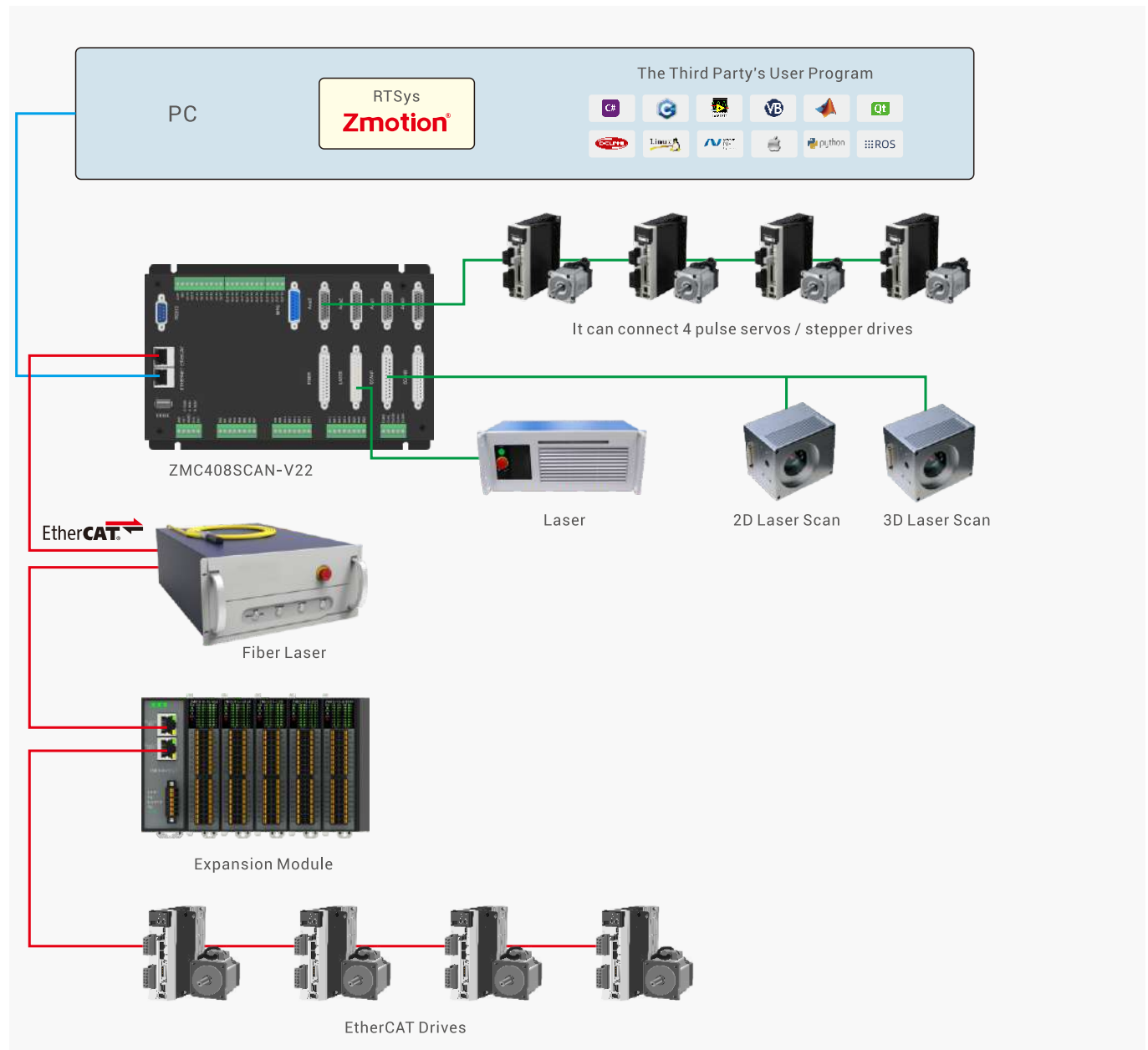
深圳市正运动技术  
有限公司



# Laser Galvanometer Motion Controller

[ZMC408SCAN-V22](#) is one independent laser galvanometer motion controller, which integrates with laser control, galvanometer control, and EtherCAT axis/ pulse axis control. And ZMC408SCAN-V22 supports high-speed PWM output, hardware position comparison output PSO, and some real-time functions (synchronous following). Compared to traditional solution of "motion control card + laser galvanometer card", **this controller greatly promotes respond speed and data processing efficiency, then it can achieve high-precision synchronous control for laser scan and axis control.**

## Open Structure



### Scan Control

Dual-channel scan use XY2-100 protocol, and 2D & 3D scan are supported.

### Laser Control

Fiber can connect to mainstream lasers: fiber, CO2, YAG, etc. The laser control signal is 5VTTL high electric level.  
Laser can connect to IPG-YLM (24V) lasers. The laser control signal is 24V high electric level.  
EtherCAT can connect to EtherCAT lasers: IPG, Raycus, etc.

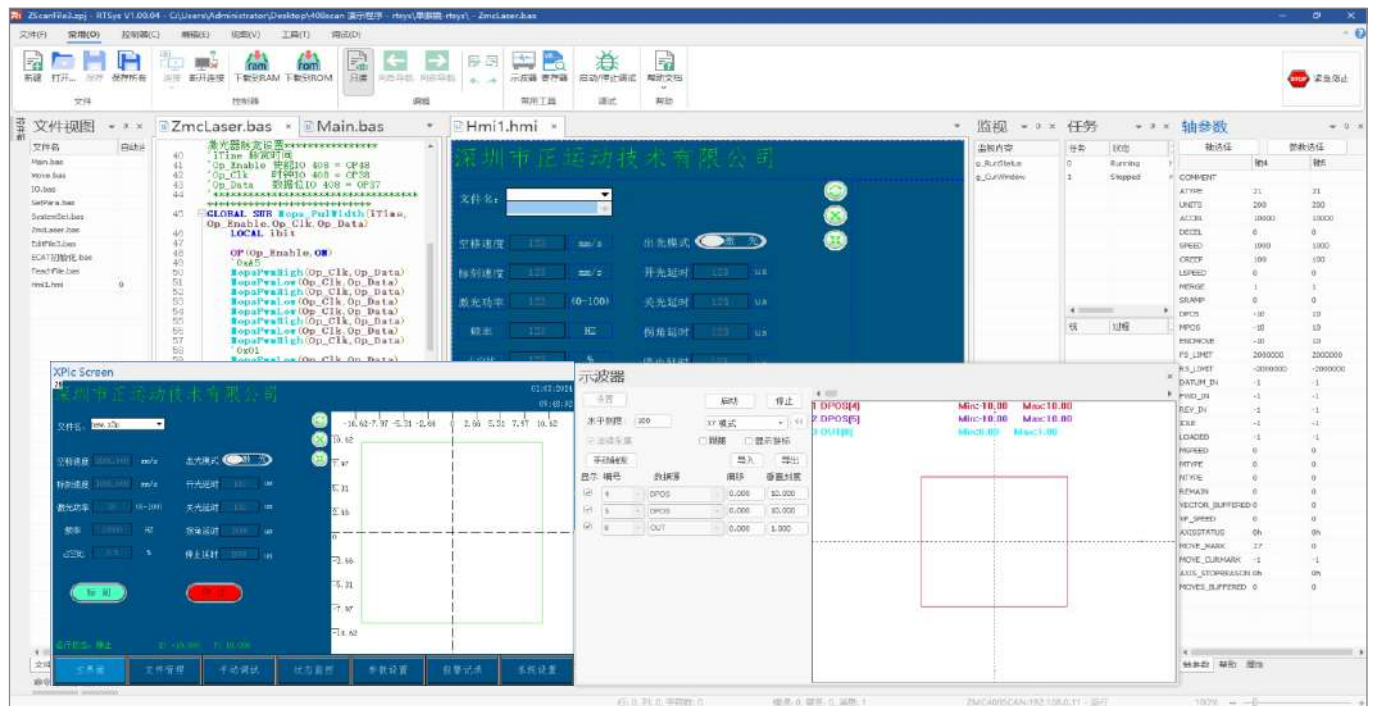
**Motion Control** Support 8 EtherCAT axes / 4 pulse + encoder feedback axes

# Second-Development Programming

## Development Environment Easy to Use | RTSys

All In One -- Development & Debug & Diagnosis

RTSys is one PC program **development, debugging and diagnosis** software for **Zmotion motion controllers**. Through RTSys, you can edit and configure controller's program easily. At the same time, it can real-time debug program that is running. In addition, real-time processing curve can be checked through oscilloscope tool, including, 2D or 3D processing trajectory.



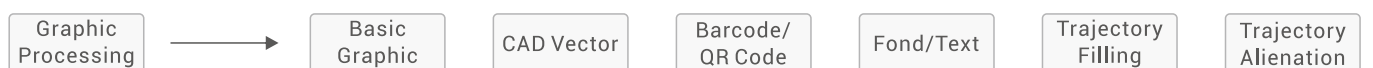
## Rich PC Motion Control API Function Interfaces

Support all kinds of operation systems and programming languages.



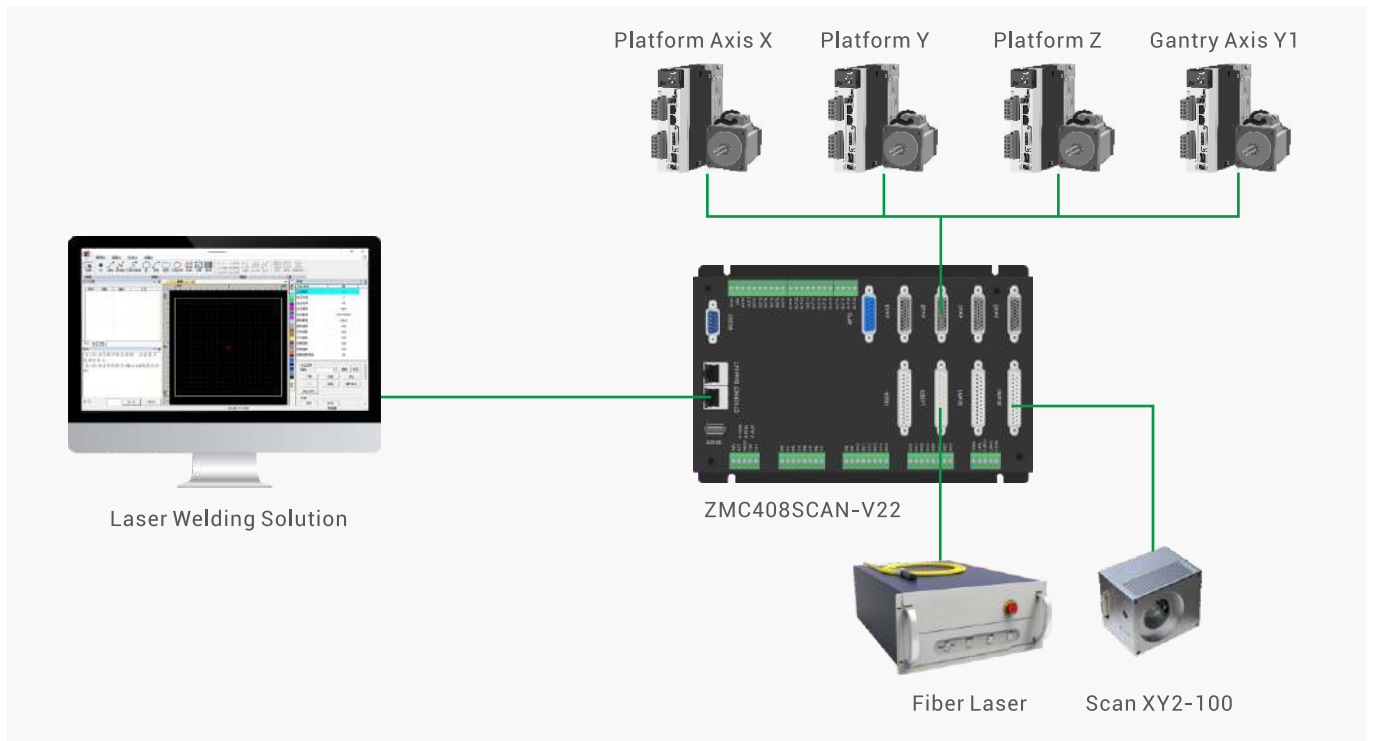
## Specialized Laser Technology API Function

Laser technology library is the motion commands' library function that can be valid in Zmotion motion controllers transformed from graphic trajectory. It supports all kinds of graphic trajectory curves (curve, text, barcode, QR code, CAD vector, etc.) and many technology functions (partial filling, curve alienation, etc.).



# XYZ Laser Galvanometer Welding

## Hardware Structure



## Solution Advantages

<b>High Integration</b>	Hardware integration of motion control, galvanometer control, with laser control, then it can simplify machine installation, reduce device cost, and promote efficiency & stability.
<b>Convenience</b>	Rapidly build solution software by rich motion control and graphic API interfaces.
<b>Power Precisely Controlled</b>	Support multiple technology controls, including power waveform, fade in and fade out, etc.

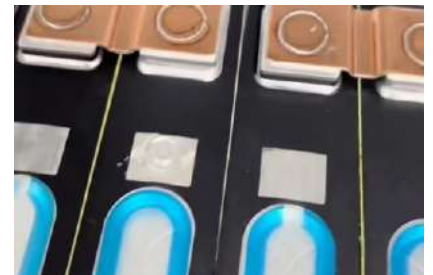
## Applications



Pole Welding & Cleaning



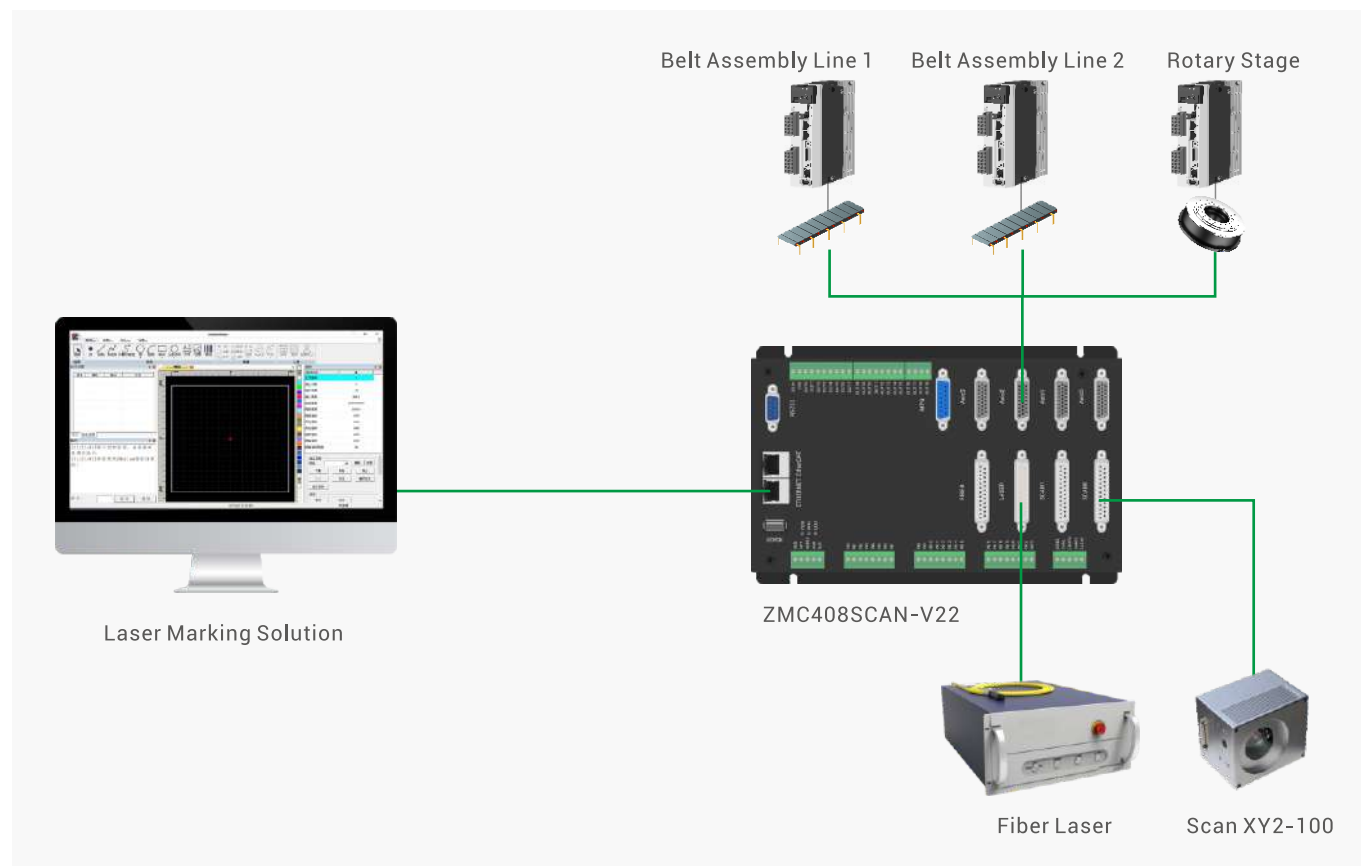
Explosion-Proof Valve Protection Sheet Welding



Connection-Sheet Welding

# Flying & Rotary Laser Processing

## Hardware Structure



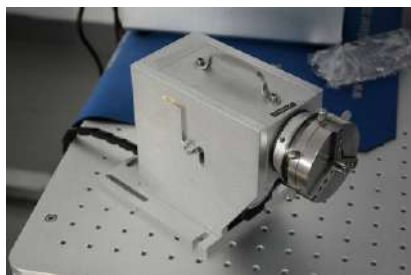
## Solution Advantages

<b>High Precision</b>	Promote “synchronous following precision” by customized synchronous following algorithm and superposition compensation control.
<b>High Stability</b>	Graphic trajectory can run offline, then device stability can be enhanced.

## Applications



Assembly Line Marking

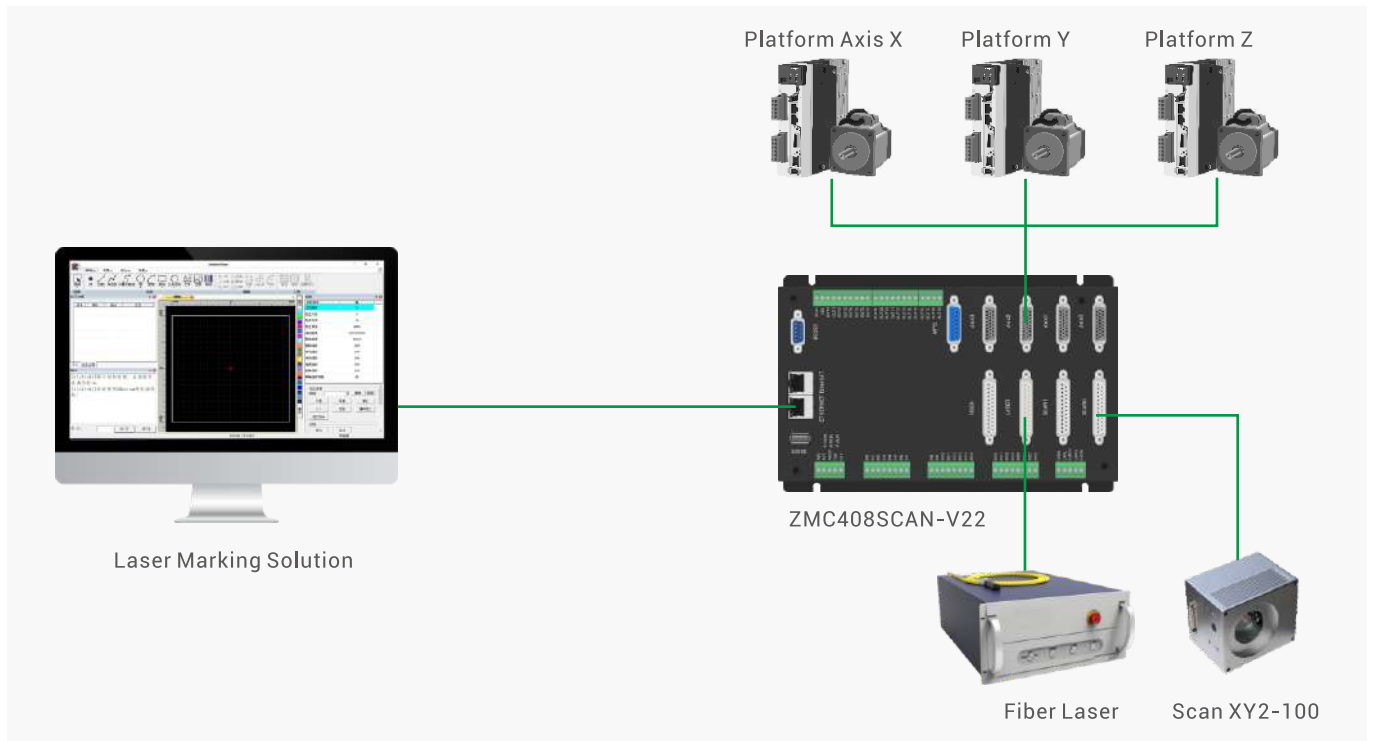


Rotary Marking



# Laser Galvanometer Linkage Processing with Unlimited View

## Hardware Structure



## Solution Advantages

High-Quality	Linkage of galvanometer and platform can clear splicing errors.
High-Efficiency	Optimize trajectory planning algorithm: decompose scan and servo motions to promote processing efficiency.
High-Precision	High-speed and high-precision processing can be achieved through platform following error algorithm of high-precision galvanometer correction, platform correction compensation, galvanometer real-time compensation.

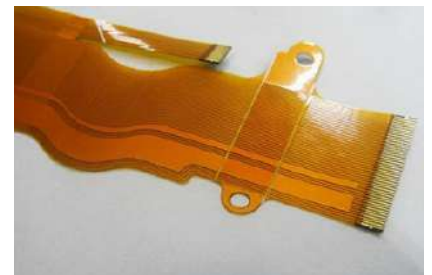
## Applications



Smart Mirror Paint Removal



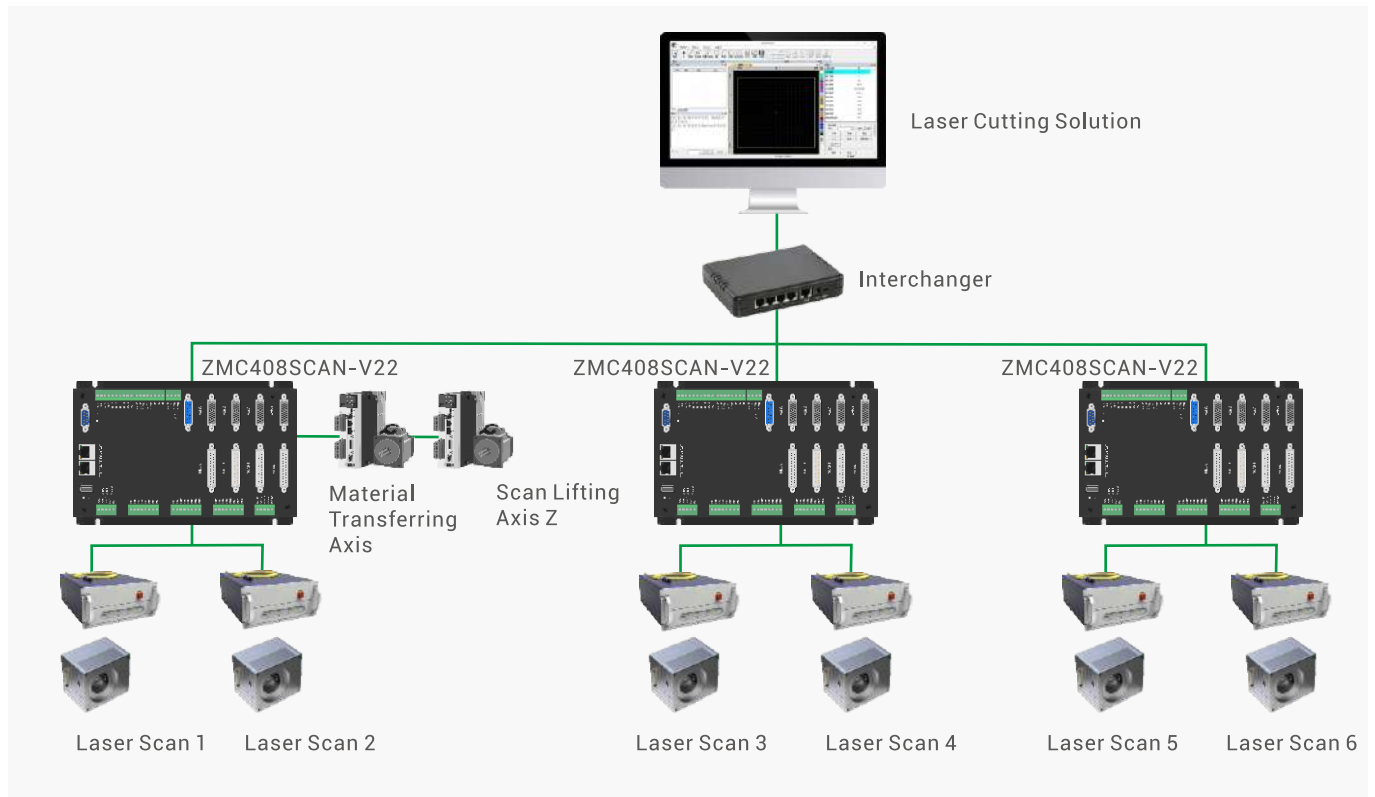
Stainless Steel Etching



Drilling & Cutting for PCB, FPC

# Multi-Scan Synchronous Processing

## Hardware Structure



## Solution Advantages

Convenient Expansion	"Ethernet" is used to communicate. Quick to expand multi-controller (multi-head processing).
High-Efficiency	It supports multi-scan correction calibration compensation, and multi-head synchronous control, then enhancing processing efficiency.
High-Stability	Multi-channel graphic trajectory can be downloaded offline, then reducing PC interaction, downloading time, promoting device stability.

## Applications



Garment Cutting



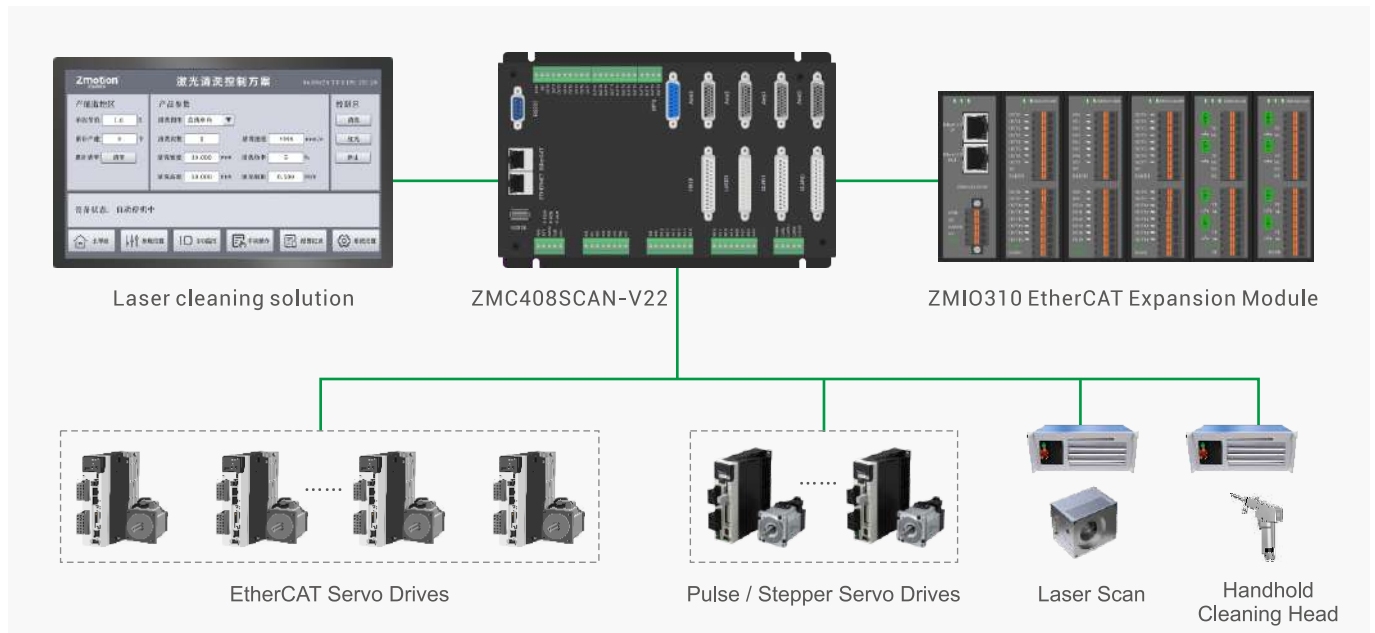
Board Material Marking



Solar Cell Laser Scribing

# Laser Cleaning Solution

## Hardware Structure



## Solution Advantages

<b>Powerful Real-Time</b>	Its "embedded offline control" supports powerful real-time processing ability: rapid to meet high-precision control requirements to make sure the cleaning effect.
<b>High-Integration</b>	Integrate all kinds of hardware interfaces, no need so many external connections, then solution reliable and stability are enhanced.
<b>Strong Flexibility</b>	It supports multiple interfaces and communication protocols: convenient to integrate with other devices, then be applied in various needs.

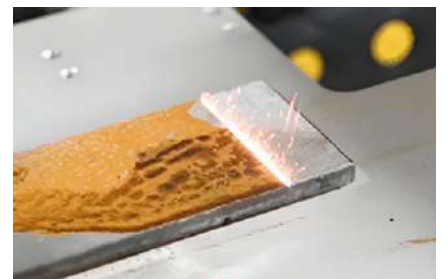
## Applications



Laser Paint Cleaning



Laser Rust Cleaning



Laser Dirty Cleaning



# Galvanometer Correction

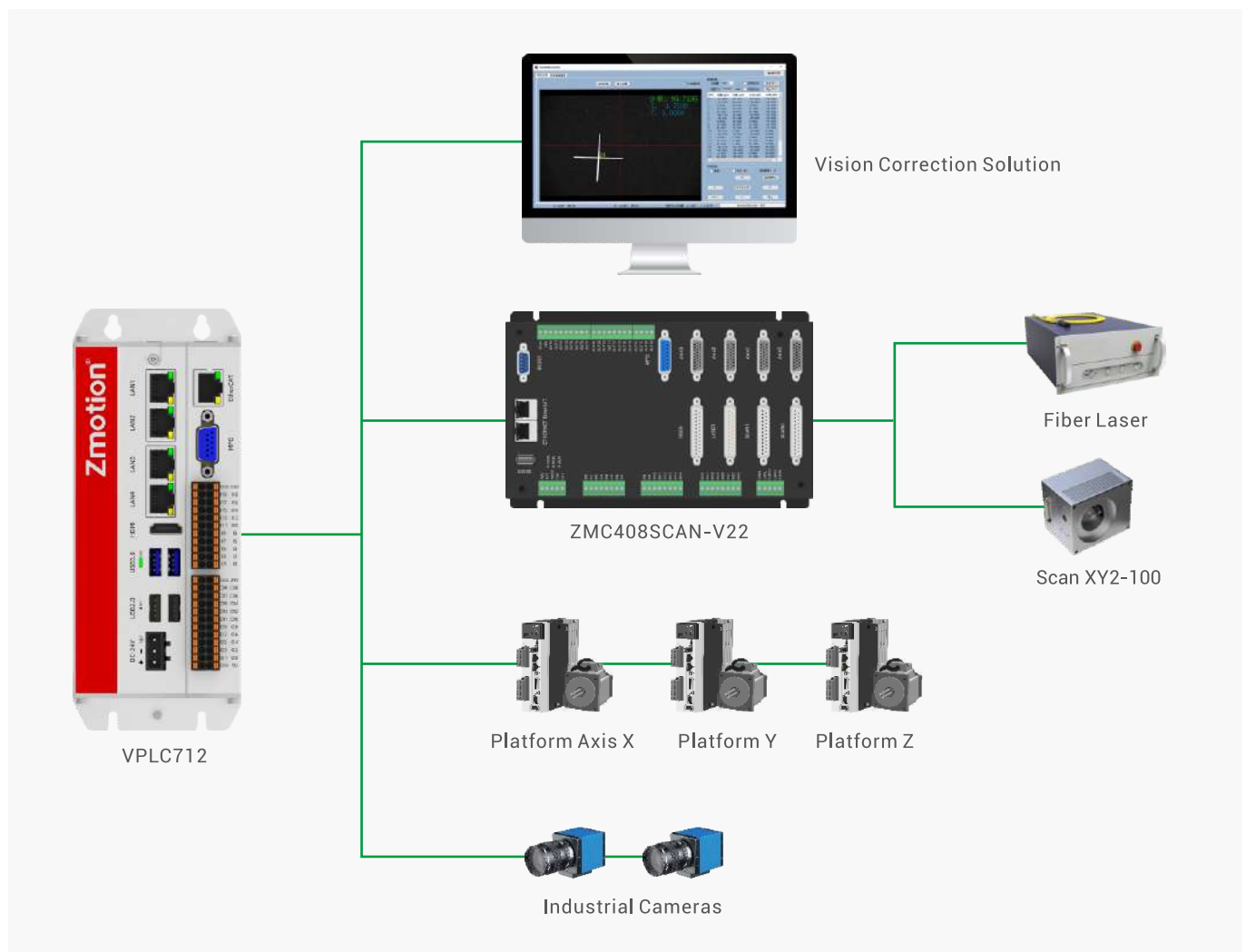
For galvanometer scanning distortion, there are specialized correction software and API interfaces. It supports many scan correction methods, like, BOX correction, 9-point correction, 25-point correction, multi-point graphic correction of scanner, multi-point correction of vision platform, etc.

## High-Precision Vision Platform Correction Solution

Match high-precision XY platform with vision camera to capture coordinates data, then generate correction data through galvanometer correction algorithm, at last, high-precision scan correction file will be produced.

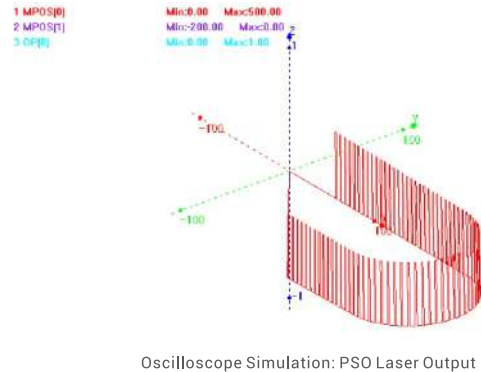
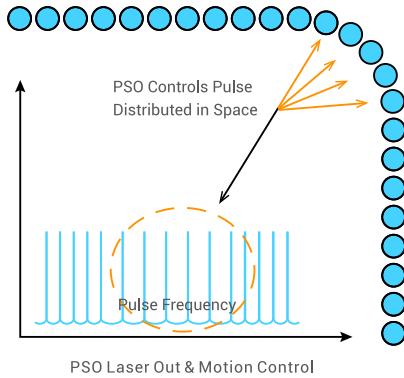


## Hardware Structure



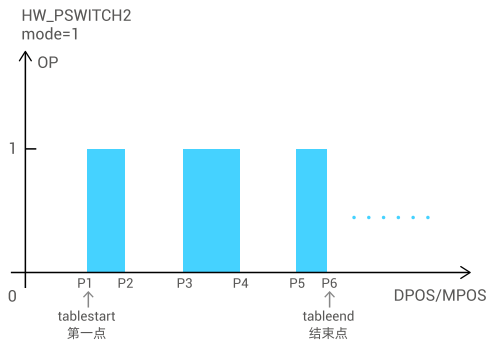
# Open PSO in Laser Processing

PSO (Position Synchronization Output). It triggers the laser pulse at precise position to switch on / off with one fixed distance, then achieves laser precision control. At the same time, it captures encoder feedback (or pulse) to do position comparison in real-time, then do phase synchronization with the laser signal output. In the process of processing trajectory motion, trigger laser output switch according to one fixed or customized distance interval, including stages of acceleration, deceleration, and constant speed, then pulse energy can be distributed in processed object uniformly.



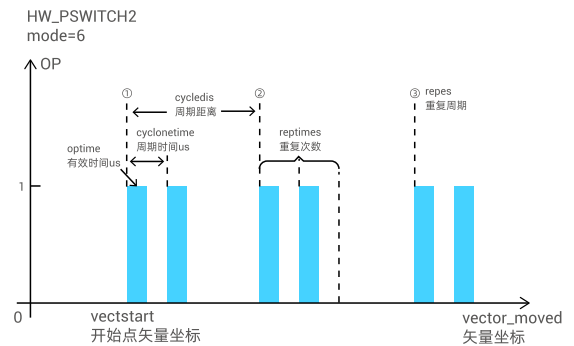
## 1. Customized Position Output

Invert electric level according to set position.



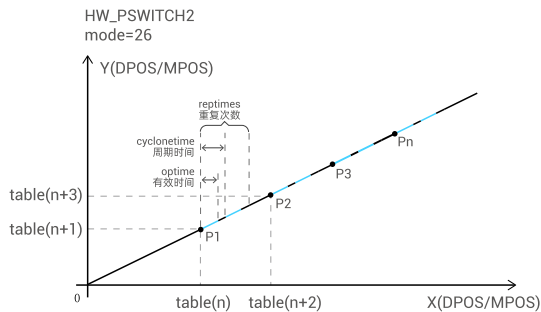
## 2. Period Out Mode at Fixed Distance

Set fixed distance, each place inverts once / multi-time in cycle.



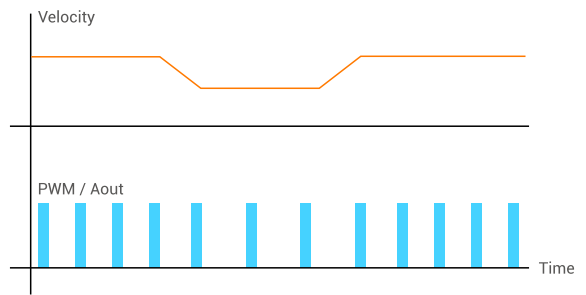
## 3. XYZ 3D Position Comparison Output

Self-define XYZ position output, and XYZ 3D position comparison output can be achieved synchronously.



## 4. PWM & Analog & Speed Output Synchronously

There is one proportional change among PWM duty ratio, analog output, and laser beam path speed.



## Applications:






Laser Galvanometer Marking, Large Field Splicing Marking, Fly-Marking, Large Field Laser Cutting, Laser Fly-Cutting, Laser Welding, Laser Punching Molding, Linkage Marking of Scan-Axis and Motion Axis, Laser Cleaning, Laser Polishing, Laser Cladding, Laser Additive Manufacturing, Wafer Marking, PCB and FPCB Drilling, 3D processing, etc.



# Product Specification

Model	ZMC408SCAN-V22
Controllable Axes	4 pulse axes / up to 16 EtherCAT axes
Scan-Axis	2 XY scan-axis, support 2D / 3D scan
EtherCAT Control Period	1ms by default (there are 1ms / 500us / 500us)
Scan Period	10us by default
Motion Mode	point to point, electronic cam, electronic gear, interpolation (line, arc), look-ahead
Development	RTSys / C# / C++ / Labview .....

## Models

Models	Image	Motor Axes	En-coder	Bus Axes	Scan Axes	Pulse Fre	Laser	Hand wheel	Inner IN & OUT	Inner AD	Inner DA	Axis Motion Buffer	Pro Space	Task	Power-Off Storage	232	485	Net	ECAT	Size (mm)
ZMC408SCAN-4-V22		4	4	32	4	10M	1	1	24+8/20+8	2	2	2048	160M	12	8000	1	1	1	1	235*149
ZMC408SCAN-6-V22		6	4	32	4	10M	1	1	24+8/20+8	2	2	2048	160M	12	8000	1	1	1	1	235*149
ZMC408SCAN-8-V22		8	4	32	4	10M	1	1	24+8/20+8	2	2	2048	160M	12	8000	1	1	1	1	235*149
ZMC408SCAN-12-V22		12	4	32	4	10M	1	1	24+8/20+8	2	2	2048	160M	12	8000	1	1	1	1	235*149
ZMC408SCAN-16-V22		16	4	32	4	10M	1	1	24+8/20+8	2	2	2048	160M	12	8000	1	1	1	1	235*149

## Installation Size

