

SMARTGUY



机内对刀仪系列

In-machine Tool Presetter Series



视觉机内对刀仪

In-machine Visual Tool Presetter

- 领先的视觉检测技术：CCD 图像观测，方法通用，直观准确，基于机器学习算法对刀具类型和状态进行智能识别

Leading visual detection technology: CCD image observation, general method, intuitive and accurate, based on machine learning algorithm for tool type and state of intelligent identification.

- 强大的机内测量能力：可机内检测刀具的尺寸和磨破状态，动态修正刀补数据，避免工件报废和机床损伤

Powerful in-machine measurement capability: it can detect the size and wear status of the tool in the machine, dynamically modify the tool data, to avoid scrap workpiece and machine damage.

- 全自动测量：安装和使用简单，通过测量宏程序可实现全自动测量，无需人工介入，兼容主流数控系统

Automatic measurement: easy to install and use, automatic measurement can be achieved through the macro measurement program without manual intervention, compatible with the mainstream CNC system.

- 恶劣工况下可靠运行：独特的光学窗口防护设计，在切削液、油雾环境下能够保持光路清洁，持续可靠地工作

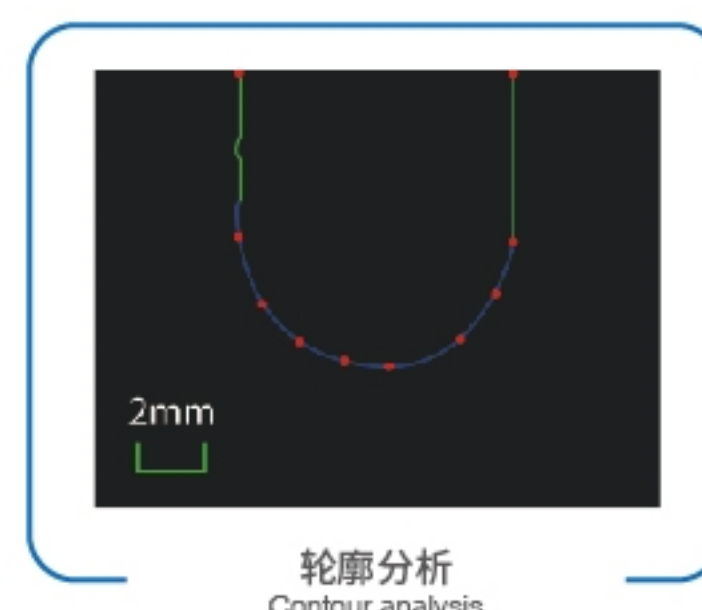
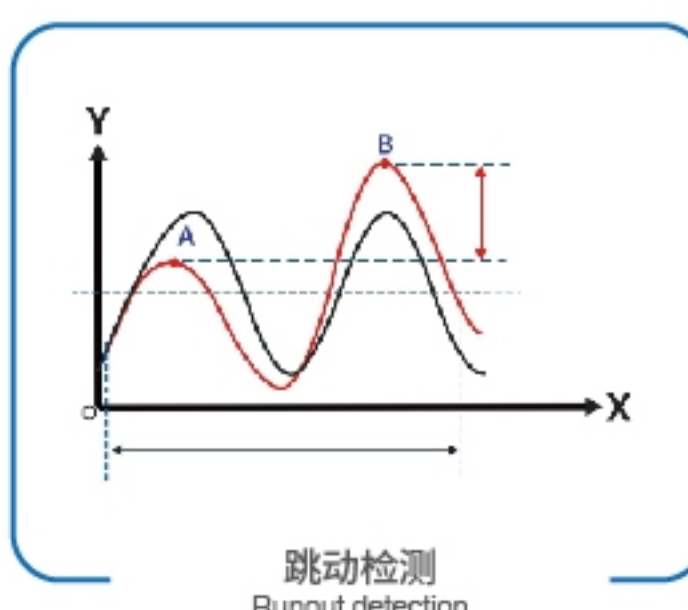
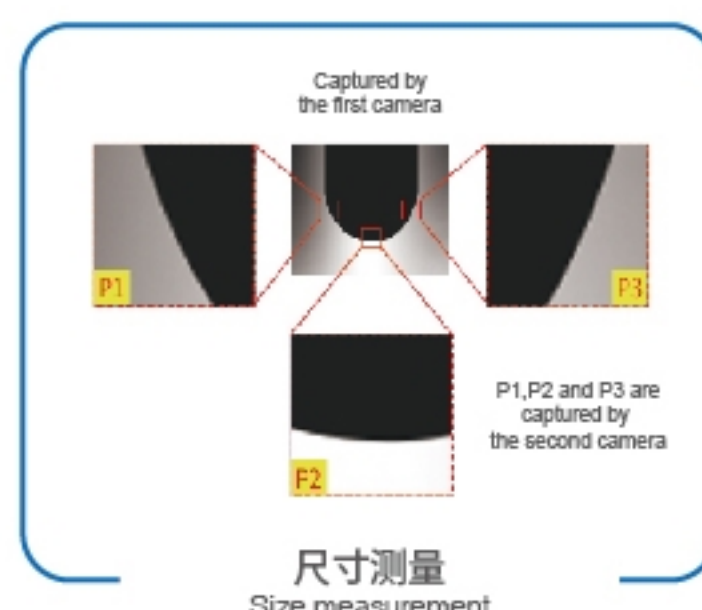
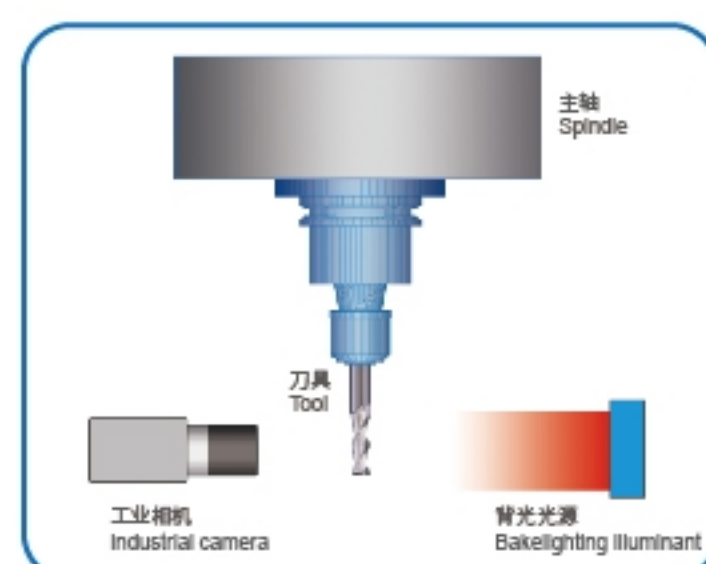
Reliable operation under harsh working conditions: unique optical window protection design, keep the optical path clean and work continuously and reliably in cutting fluid and oil mist environment.

- 组成物联网：多台 VTM 通过工厂局域网与刀具数据服务器进行互联，组成刀具检测传感器物联网，构建刀具与工艺大数据分析的基础

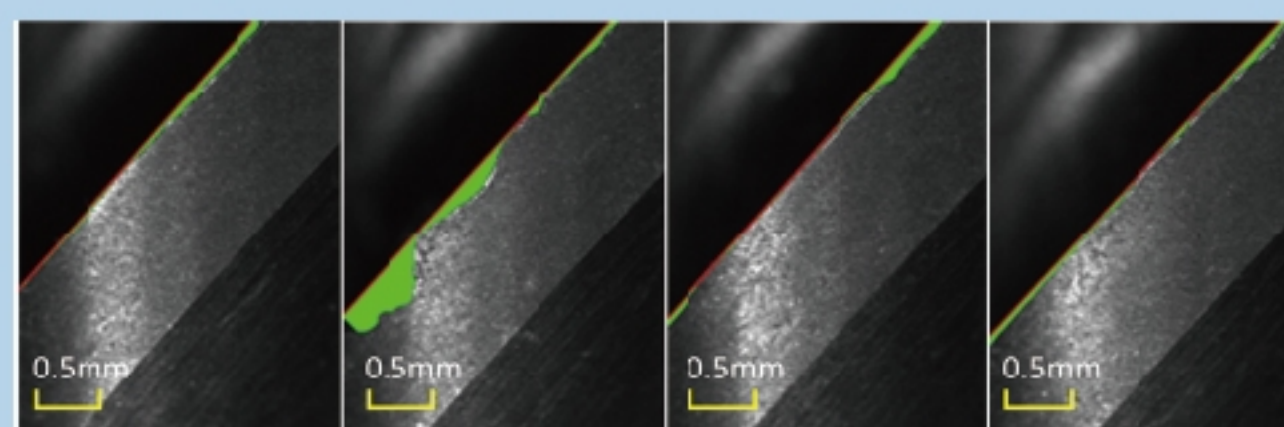
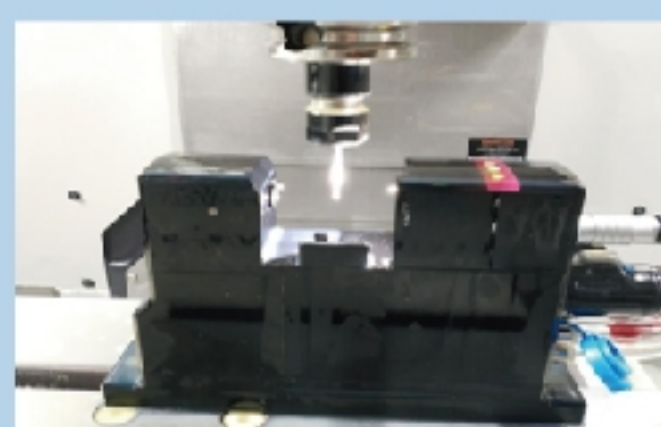
Constitute the internet of things: multiple VTMS are interconnected with the tool data server through the local area network of the factory to form the tool detection sensor internet of things, and build the basis of tool and process big data analysis.

基于数字图像的机内刀具检测技术

In-machine Tool Detection Technology Based on Digital Images



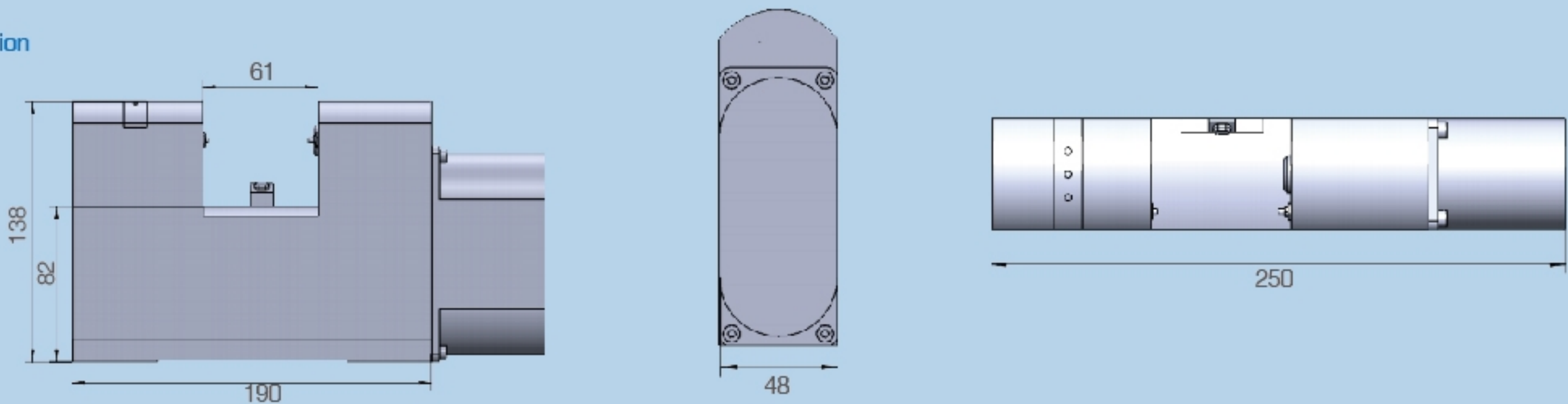
旋转状态下逐齿磨损检测
Tooth-by-tooth wear detection under rotating conditions



	接触式对刀仪 Contact tool presetter	激光对刀仪 Laser tool presetter	VTM
技术原理 Technical principle	压电效应 Piezoelectric effect	激光遮挡 Laser blocking	CCD+AI
测量方式 Measuring mode	接触式 Contact	非接触 Non-contact	非接触 Non-contact
尺寸测量 Size measurement	✓	✓	✓
跳动检测 Runout detection	x	✓	✓
成形刀具检测 Forming tool detection	x	x	✓
逐齿磨损检测 Tooth-by-tooth wear detection	x	x	✓
检测精度 Detection accuracy	低 Low	高 High	高 High
测量循环时间 Measurement cycle	慢 Slow	较慢 Relatively slow	快速 Fast
小尺寸刀具 Small-size tool	测量数据不可靠 Measured data are not reliable	测量数据不可靠 Measured data are not reliable	理想方案 Ideal solution

产品尺寸

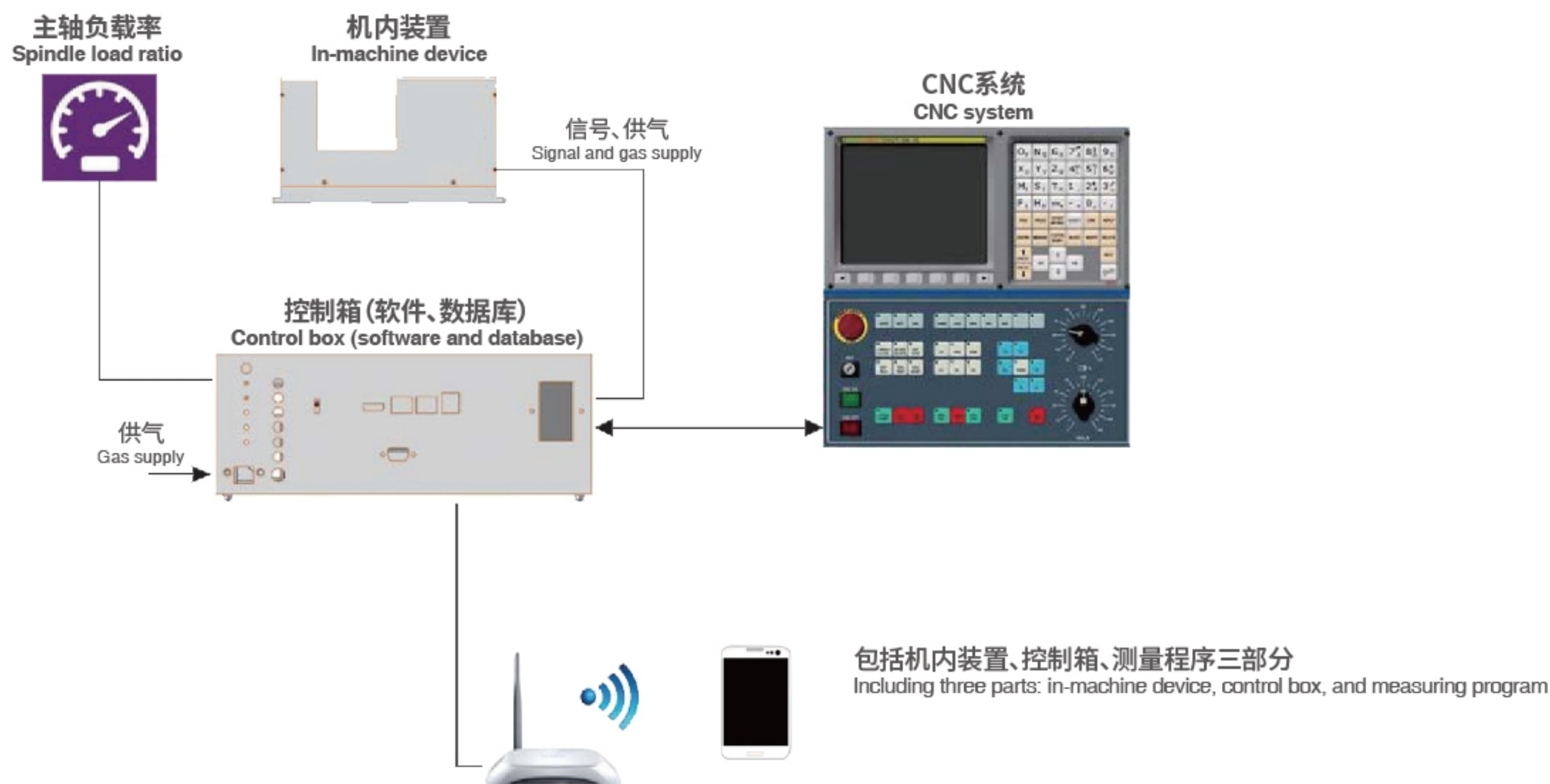
Product Dimention



产品参数

Product Parameters

型号规格 Model and Specification		标准型 Standard model VTM-NC35-B
规格参数 Specification Parameters	测量范围 Measurement range	0.1-35mm
	重复精度 Repetitive accuracy	1μm(全幅 full width)
	绝对精度 Absolute accuracy	3μm
	防护等级 Protection grade	IP67
	通讯协议 Communication protocol	OPC-UA、Modbus、RS232、TCP/IP
基础功能 Basic Functions	对刀(径向、轴向) Tool aligning (radial and axial)	✓
	磨损检测(径向、轴向) Wear detection (radial and axial)	✓
	刀补写入 Tool compensation write-in	✓
	跳动检测 Runout detection	✓
	折断检测 Fracture detection	✓
选配功能 Optional Functions	主轴热伸长监测 Spindle thermal elongation monitoring	✓
	崩刃监测 Edge collapse detection	✓
	成型轮廓监测 Forming contour detection	✓
	远程数据推送 Remote data pushing	✓
	刀具数据管理 Tool data management	✓

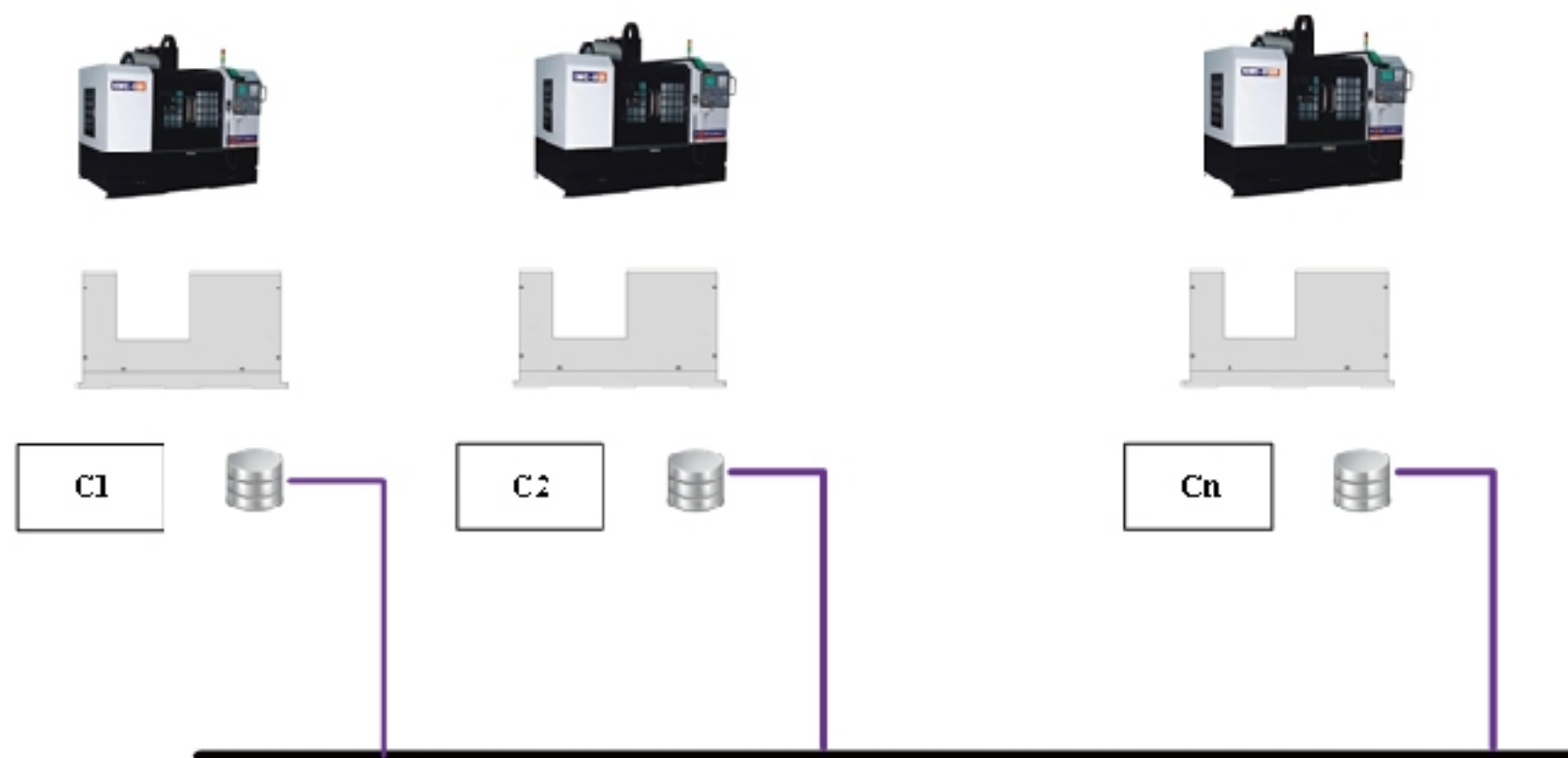


测量程序 Measuring program

主程序:采集刀具图像, 进行自动分析
Main program: it collects tool images for automatic analysis

宏程序:NC代码形式, 作为子程序被加工NC程序调用中。与测量主程序一起运行, 实现刀具自动检测
Macro program: it adopts NC codes and is to be called by the machining NC program as a subprogram. It runs together with the main measuring program to realize automatic tool

组成刀具检测网络 (联网模式) Forming A Tool Detection Network (Network Mode)



多台 VTM 通过工厂局域网与刀具数据库进行互联, 组成刀具检测传感器物联网

Multiple VTMS are interconnected with the tool database through the local area network of the factory to form the tool detection sensor internet of things.

基于刀具的唯一身份 ID 编码, 传感器网络把同一把刀具在不同机床上产生的动态数据 (尺寸、磨损状态、加工累计时间) 进行追踪, 并持续推送到刀具数据服务器, 进行后续分析

Based on the unique ID of the tool, the sensor network can track the dynamic data (size, wear status, and cumulative machining time) generated by the same tool on different machine tools, and continuously push such data to the tool data server for subsequent analysis.



刀具数据服务器
Tool Data Server

激光对刀仪

Laser Tool Presetter

激光对刀仪提供了一种快速精确和灵活的工具尺寸控制手段,使加工过程的自动化程度得到很大提升。

The laser tool presetter provides a fast, accurate and flexible tool size control means, which can greatly improve the automation degree of the machining process.

与接触式检测设备和离线对刀仪相比,具有显著的优点:

Compared with contact detection equipment and offline tool presetter, it has significant advantages as follows:

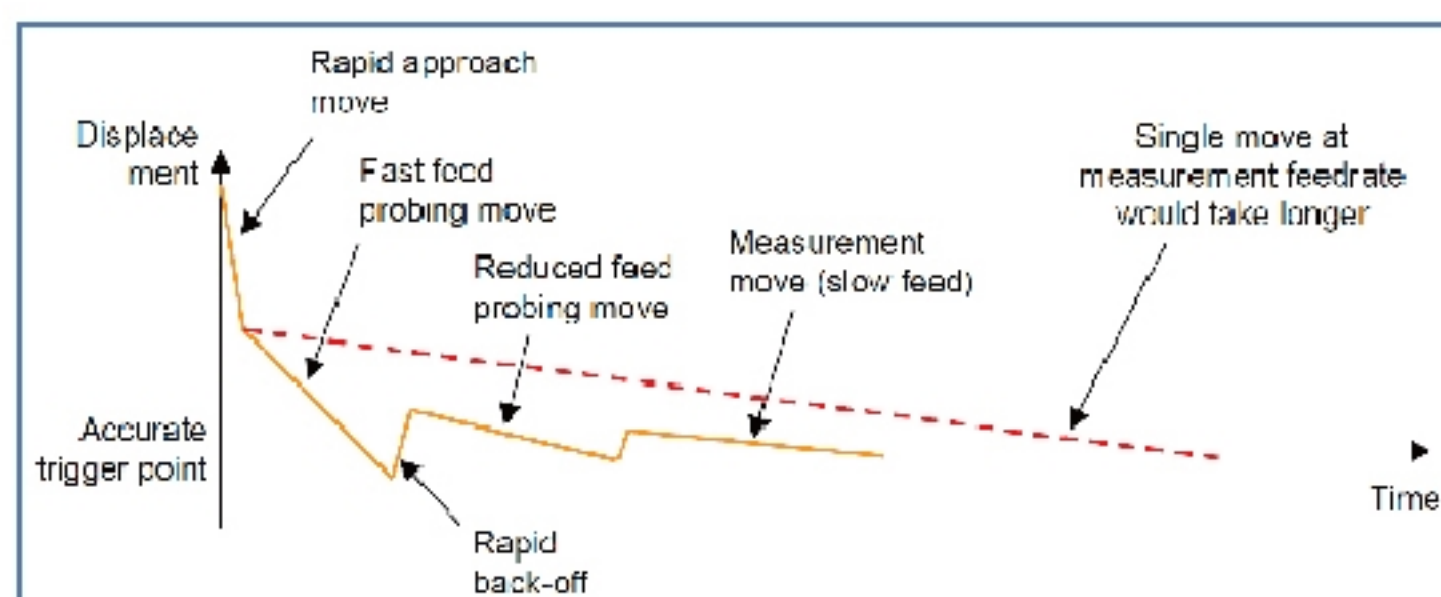
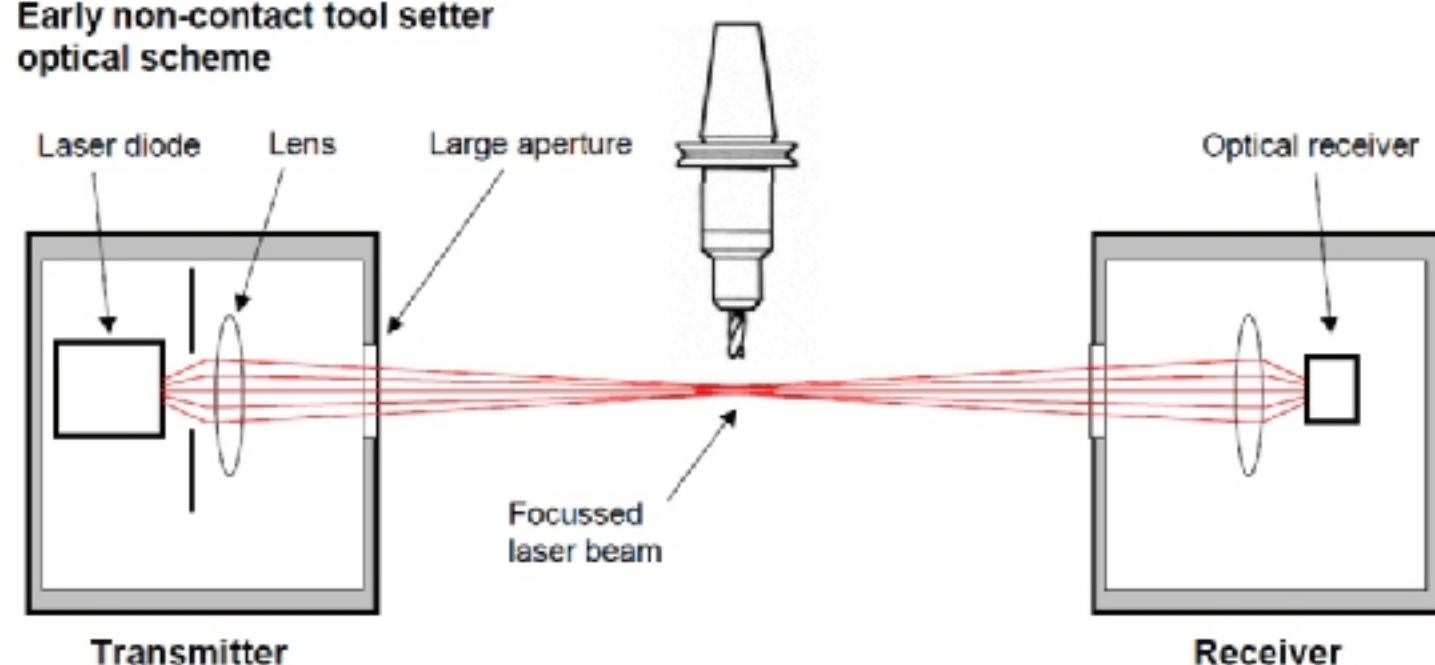
(1) 缩短刀具调整时间,实现精确的刀具长度和直径测量,获得刀具的跳动和振摆圆锥参数

It can shorten the tool adjustment time, realize accurate measurement of tool length and diameter, and obtain tool parameters of runout and conic

(2) 能够测量非常小的精巧的刀具,不会对刀具造成磨损或损坏,检测循环时间短

It can measure very small and delicate tools without wear or damage, with a short detection cycle time

Early non-contact tool setter optical scheme



科益展智能装备有限公司

SMARTGUY INTELLIGENT EQUIPMENT CO., LTD.

地址: 中国广州市黄埔区瑞泰路二号创造者园区

Address: No.2 Ruitai Road, Huangpu District, Guangzhou, China

电话 Tel : +86 20 8788 8831 邮箱 E-mail: sales@smartguy.com.cn

传真 Fax : +86 20 8788 8832 网站 Web : www.smartguy.com.cn



科益展官方网站
Official Website



科益展微信公众号
WeChat