

WELLLIH Robot is located in Yuyao, Ningbo, Zhejiang Province. Founded in 2003, it is a national high-tech enterprise and a national "Key Little Giant" enterprise under the category of specialized, refined, characteristic, and innovative enterprises. Adhering to the philosophy of "upholding long-term interests and continuously creating value", the company integrates R&D, manufacturing, sales, and service of intelligent equipment, and provides integrated automated, intelligent, and digital solutions for the injection molding and metal processing industries.

Based on digital management, the company applies intelligent logistics and intelligent warehousing, and combines manufacturing processes to gradually introduce software and hardware facilities such as industrial robots complete machines and auxiliary equipment, flexible manufacturing systems, and digital production line management systems into the service fields. These solutions have been widely used in various industrial scenarios including automotive, medical, packaging, construction machinery, molds, and aerospace. Currently, WELLLIH business covers more than 90 countries and regions around the world, serving thousands of customers in the industry.



# DFMS

Digital >>>  
Flexible Manufacturing System

NINGBO WELL-LIH ROBOTS TECHNOLOGY CO.,LTD .

NINGBO WELL-LIH ROBOTS TECHNOLOGY CO.,LTD.

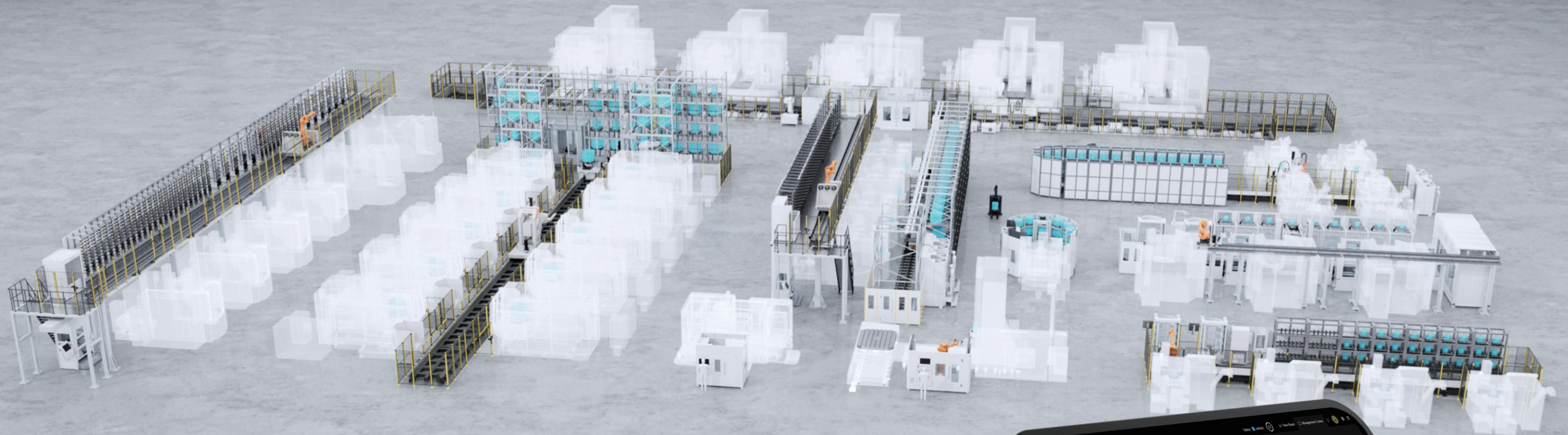
📍 No.48 Xiangqiao Road, Langxia Street, Yuyao City, Zhejiang 315480 P.R. China

✉ sales@welllih.com 🌐 <http://www.welllih.com>

☎ +86-574-58221610 📠 +86 152 5748 6355







## DFMS Digital >>> Flexible Manufacturing System

Industrial automation is an important means of achieving efficient production and manufacturing, and the application of advanced digital management models is the fundamental core of realizing intelligent production lines, intelligent workshops, and even intelligent factories.

Based on the current business scenario and actual customer needs, WELLIH has proposed the concept of Digital Flexible Manufacturing System (DFMS) for the first time in the industry, which deeply integrates industrial automation technology (AT) with information technology (IT) and control technology (OT) through digital technology, thereby empowering and improving traditional flexible manufacturing systems, achieving more accurate planning management and integrated manufacturing, and finely controlling various elements of production processes such as process execution, process quality monitoring, and equipment status management, achieving true automation, flexibility, and intelligence.

The value and advantages brought by applying WELLIH DFMS:

- Virtual simulation of equipment and production line layout, factory logistics, human-machine engineering, etc., to ensure reasonable scheme design;
- Applying digital twin technology to achieve virtual and real synchronization between physical devices and digital models, enabling remote management and predictive maintenance;
- Integrate with MES/ERP/WMS/CAM and other systems to achieve data collection, transmission, exchange, and management between them, providing a foundation for the digitalization of factories;
- Effectively solve the problem of processing multiple varieties and small batches, reduce manual intervention, improve equipment utilization, enhance product quality, and reduce production costs, achieving 24-hour



**Leading Expert in  
Flexible Manufacturing**



# Intelligent Production Scheduling and Resource Optimization

## DFMS Digital Flexible Manufacturing System



### Automatic Adaptive Processing

Real-time analysis and processing of data, automatic adjustment of cutting parameters, improvement of efficiency and quality, achieving intelligent and adaptive production.



### Path Planning

Intelligent algorithms optimize the robot's travel path, reducing time and lowering energy consumption. This achieves the best overall efficiency and promotes green production.



### Production scheduling

Dynamic optimization reduces equipment idle time, improves resource utilization, and ensures efficient production operation.



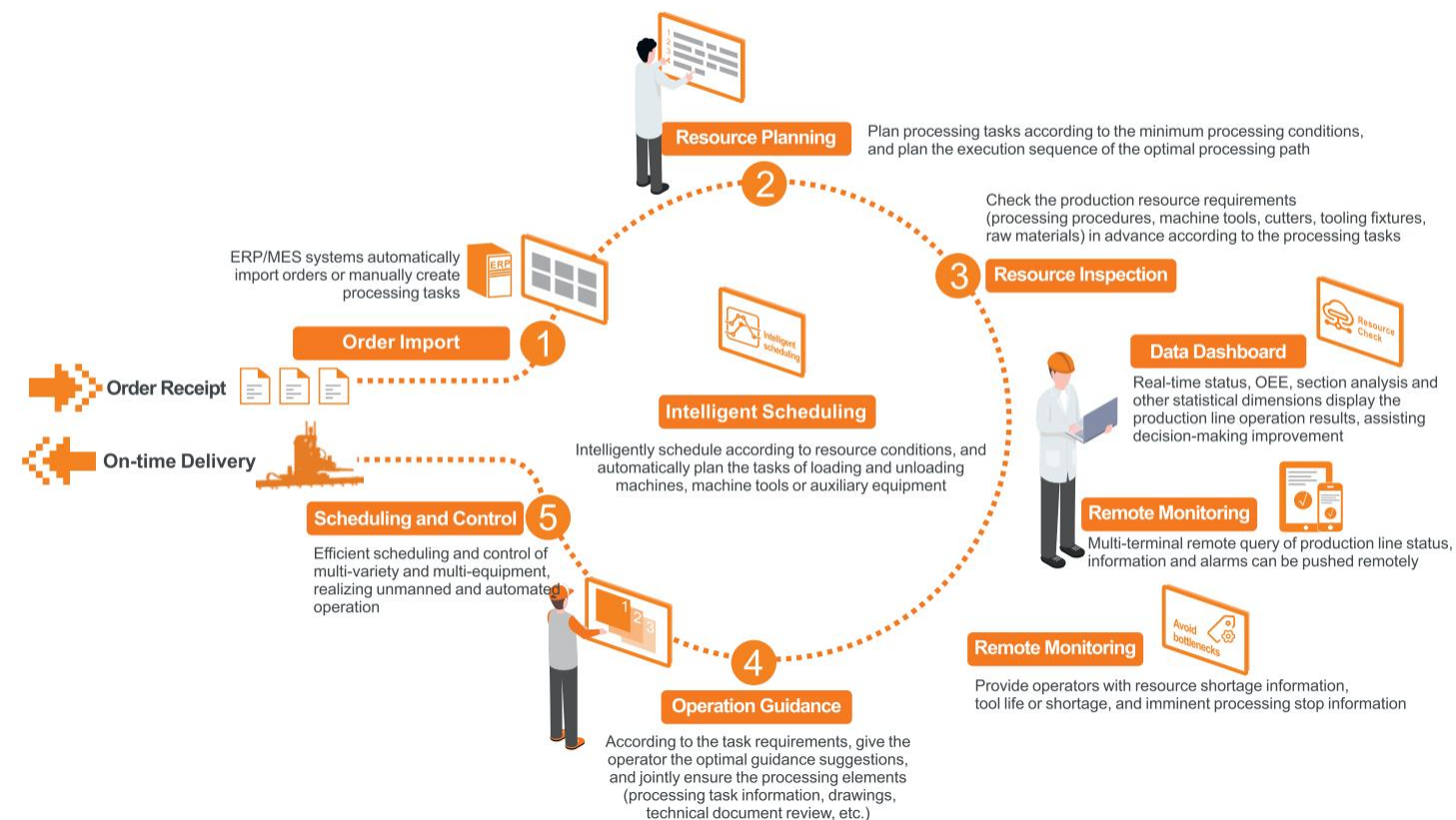
### Predictive Maintenance

Based on sensor and AI technology, real-time monitoring of equipment status, accurate prediction of failures, proactive maintenance.



### Process Optimization

Through digital twin technology, virtual production line simulation plans are constructed to optimize processing flows, ensure efficiency and accuracy, and reduce trial-and-error costs.



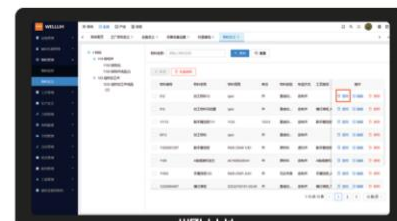
## DFMS Workflow

## Main functions of control system



### B/S architecture, multi platform, strict permission authentication and log management

- B/S architecture, multi platform, strict permission authentication and log management
- Multilingual, supporting multiple styles and theme selection settings



### Flexible custom basic settings

- Corresponding processing equipment and CNC programs, measurement timing, and work step logic can be set according to different processes of different workpieces
- When new products and processes enter the production line for processing, the system only requires simple parameter settings to complete the preparation before processing



### Intelligent Scheduling

- According to the production plan, automatically calculate the optimal processing sequence through scheduling algorithms
- Can integrate MES or ERP systems, receive task instructions, and provide real-time feedback on task execution status



### Requirement monitoring

- Automatically calculate the demand for materials, processing programs, tools, etc. based on the processing schedule
- When resources do not match, accurate and sufficient guidance can be provided to operators for timely and collaborative support
- Combined with tool life management, it can plan, predict, and warn tool demand in advance, and provide backup and loading plans for tools



### Central tool library management system

- Manage the central tool library, display tool life in real-time and provide prompts through different colors. The system will automatically process before machining schedule the tools in the tool library to meet the machining requirements
- Implement automatic management of external tool library and life based sharing of internal tools



### Analysis Report

- OEE analysis
- Fault and maintenance analysis
- Production output analysis
- Quality analysis



Main control interface

Cross platform, multi terminal flexible application, Support deployment of multiple factories, multiple workshops, and multiple production lines, Fully utilizing digital technology, Intelligent production line scheduling control and management based on production planning, Meet the needs of more flexible manufacturing.

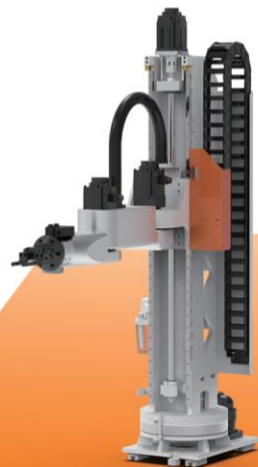




# Product system



**TransMaster R**  
BY WELLLIH ROBOTICS



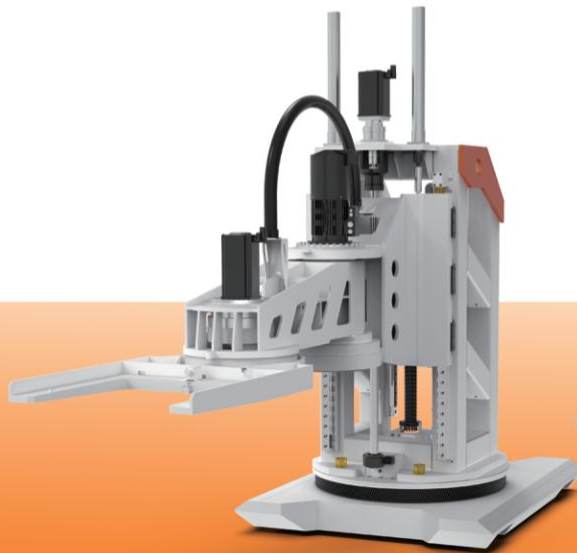
R1/R3



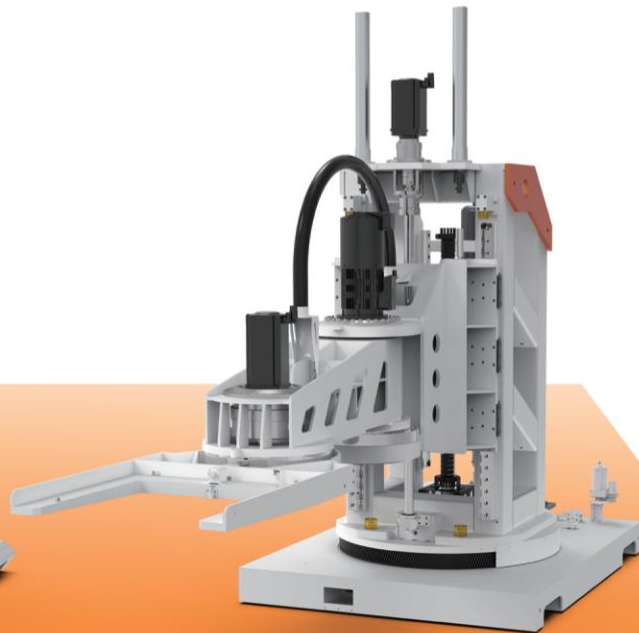
R5



R10L



R10



R20/R30

**TransMaster T**  
BY WELLLIH ROBOTICS



DT10

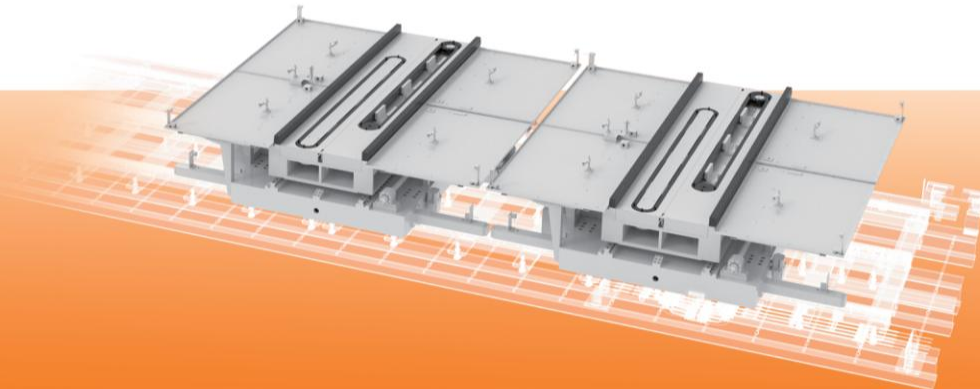


T10



T20/T30

**TransMaster M**  
BY WELLLIH ROBOTICS



M500/M1000

Note: the figure represents the corresponding load, multiplied by 100kg, e.g. R3, represents the load of 300kg



Five axis multi degree of freedom intelligent handling mechanism

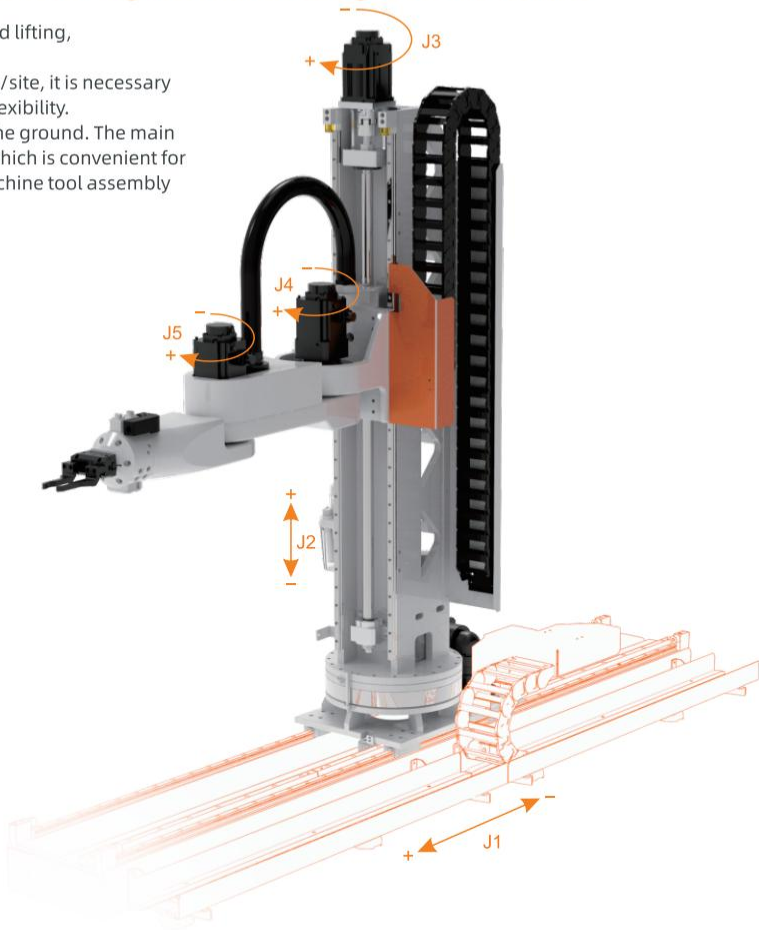
**Equipment features:** long arm extension, five axis linkage, high load lifting, J1 axis can be expanded in the future.

**Application conditions:** Due to limitations in processing equipment/site, it is necessary for the handling equipment to have long arm extension and high flexibility.

**Installation method:** The horizontal track is installed and fixed on the ground. The main structure and electrical control box can be assembled modularly, which is convenient for customers to install quickly on site and meets the needs of new machine tool assembly and old machine tool automation transformation.

Trans Master R1/R3 Parameter	
Maximum load	100KG/300KG
Fork arm extension	1400mm
J5 axis no-load disturbance	0.5mm
J5 axis full load disturbance	3mm
J5 axis repeat positioning accuracy	±0.25mm
J2 axis repeat positioning accuracy	±0.1mm
Maximum moving speed of j2 axis	15m/min
Total length of track	Depending on the actual deployment situation
Track repeatability accuracy	±0.1mm
Maximum moving speed of the track	60m/min
Power supply	3P 380V/50Hz
Control system	WELLIH

Please note that the specifications and appearance are subject to change due to improvements or other reasons.



Scheme composition



Five axis multi degree of freedom intelligent handling mechanism

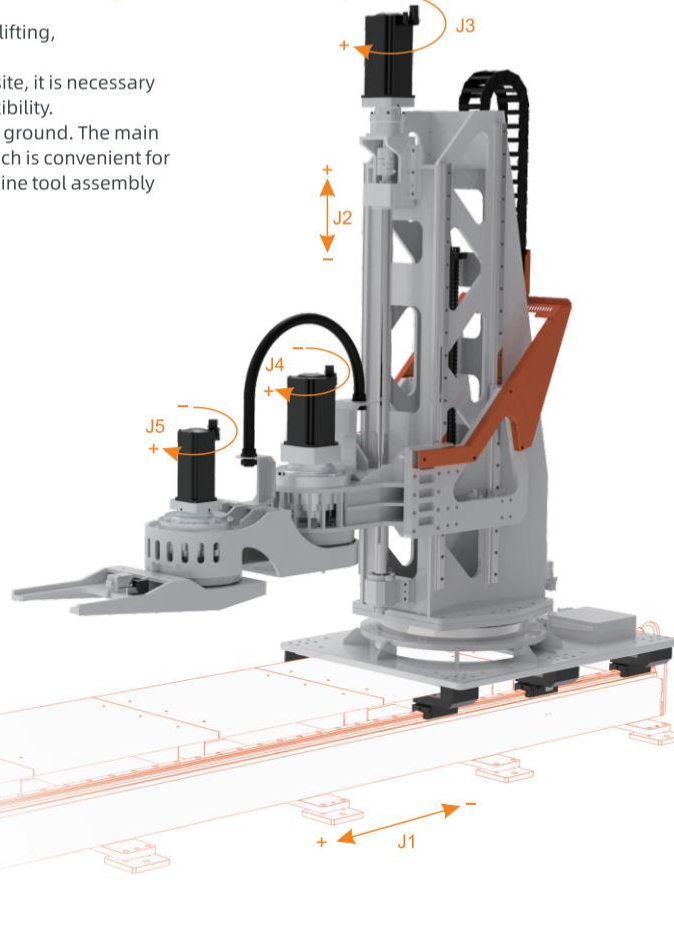
**Equipment features:** long arm extension, five axis linkage, high load lifting, J1 axis can be expanded in the future.

**Application conditions:** Due to limitations in processing equipment/site, it is necessary for the handling equipment to have long arm extension and high flexibility.

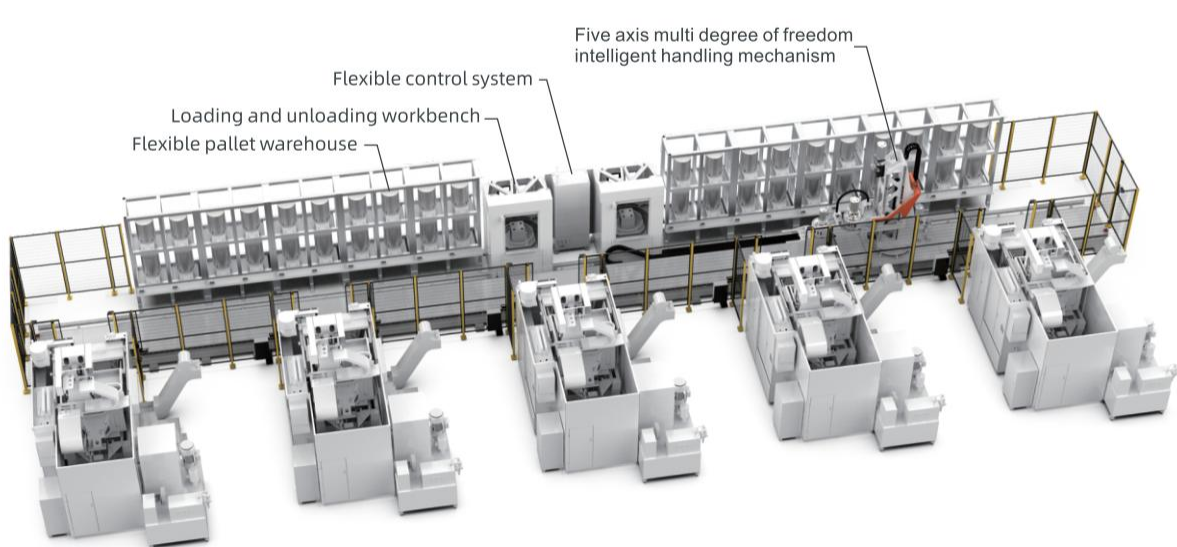
**Installation method:** The horizontal track is installed and fixed on the ground. The main structure and electrical control box can be assembled modularly, which is convenient for customers to install quickly on site and meets the needs of new machine tool assembly and old machine tool automation transformation.

Trans Master R5 Parameter	
Maximum load	500KG
Fork arm extension	2300mm
J5 axis no-load disturbance	0.5mm
J5 axis full load disturbance	≤5mm
J5 axis repeat positioning accuracy	±0.5mm
J2 axis repeat positioning accuracy	±0.1mm
Maximum moving speed of j2 axis	15m/min
Total length of track	Depending on the actual deployment situation
Track repeatability accuracy	±0.1mm
Maximum moving speed of the track	60m/min
Power supply	3P 380V/50Hz
Control system	WELLIH

Please note that the specifications and appearance are subject to change due to improvements or other reasons.



Scheme composition





Four axis multi degree of freedom intelligent handling mechanism

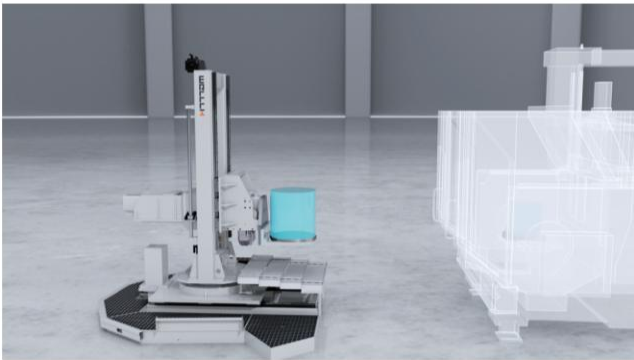
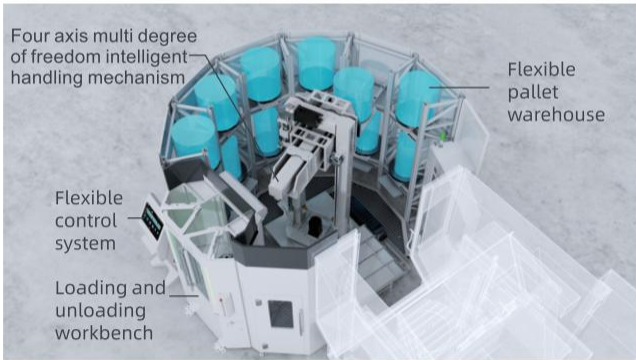
**Equipment features:** Five axis linkage, medium load, J3 axis can rotate 360°.  
**Application conditions:** multiple varieties, few batches, single machine automatic line occasions.  
**Installation method:** The track is fixed to the ground, and the handling mechanism and pallet storage are modularized for easy on-site installation and adjustment.

Trans Master R10L Parameter	
Maximum load	1000KG
Fork arm extension	1300mm
J4 axis no-load disturbance	0.5mm
J4 axis full load disturbance	5±1mm
J4axis repeat positioning accuracy	±0.25mm
J2 axis repeat positioning accuracy	±0.1mm
Maximum moving speed of j2 axis	12m/min
Total length of track	Depending on the actual deployment situation
Track repeatability accuracy	±0.1mm
Maximum moving speed of the track	60m/min
Power supply	3P 380V/50Hz
Control system	WELLIIH

Please note that the specifications and appearance are subject to change due to improvements or other reasons.



Scheme composition

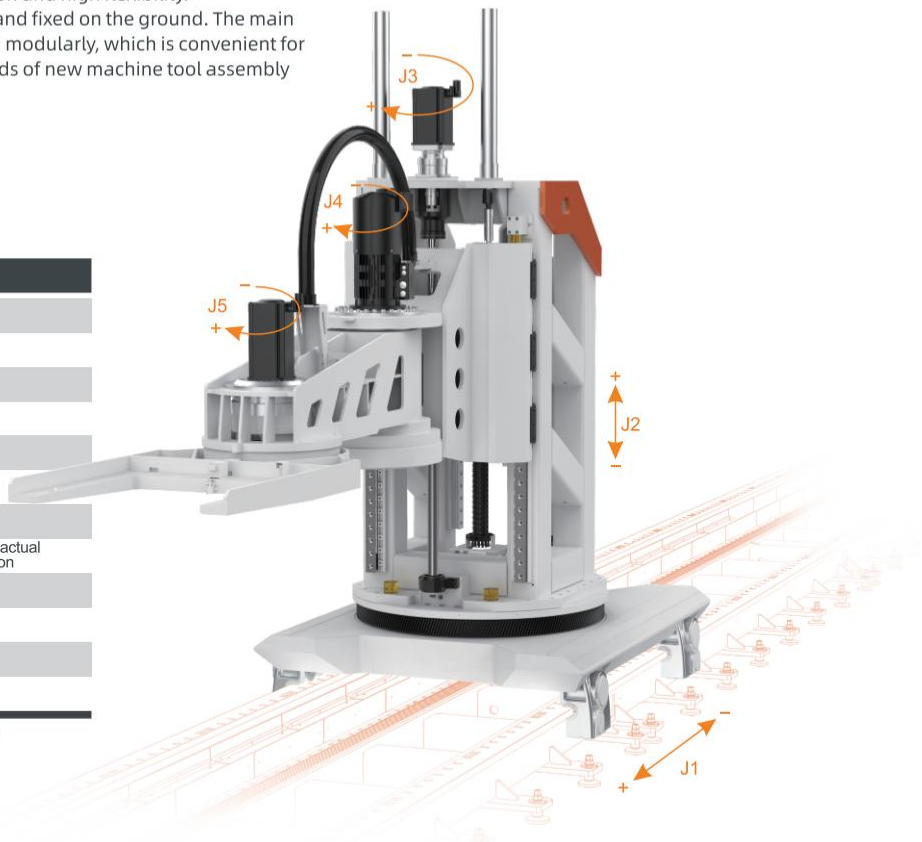


Five axis multi degree of freedom intelligent handling mechanism

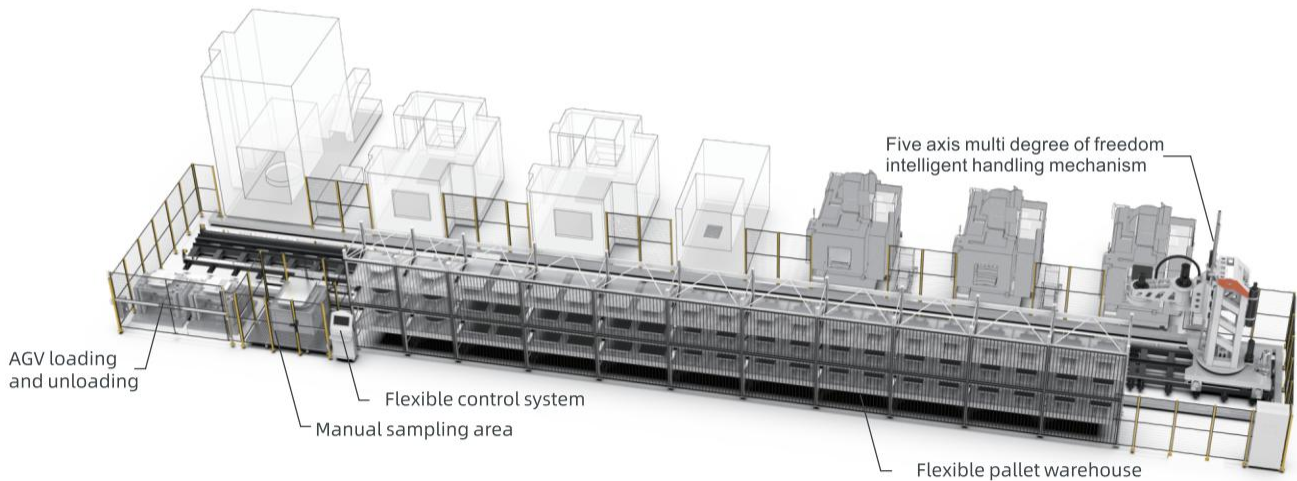
**Equipment features:** long arm extension, five axis linkage, high load lifting, J1 axis can be expanded in the future.  
**Application conditions:** Due to limitations in processing equipment/site, it is necessary for the handling equipment to have long arm extension and high flexibility.  
**Installation method:** The horizontal track is installed and fixed on the ground. The main structure and electrical control box can be assembled modularly, which is convenient for customers to install quickly on site and meets the needs of new machine tool assembly and old machine tool automation transformation.

Trans Master R10 Parameter	
Maximum load	1000KG
Fork arm extension	3400mm
J5 axis no-load disturbance	0.5mm
J5 axis full load disturbance	10±1mm
J5 axis repeat positioning accuracy	±0.5mm
J2 axis repeat positioning accuracy	±0.1mm
Maximum moving speed of j2 axis	12m/min
Total length of track	Depending on the actual deployment situation
Track repeatability accuracy	±0.1mm
Maximum moving speed of the track	60m/min
Power supply	3P 380V/50Hz
Control system	WELLIIH

Please note that the specifications and appearance are subject to change due to improvements or other reasons.



Scheme composition





Five axis multi degree of freedom intelligent handling mechanism

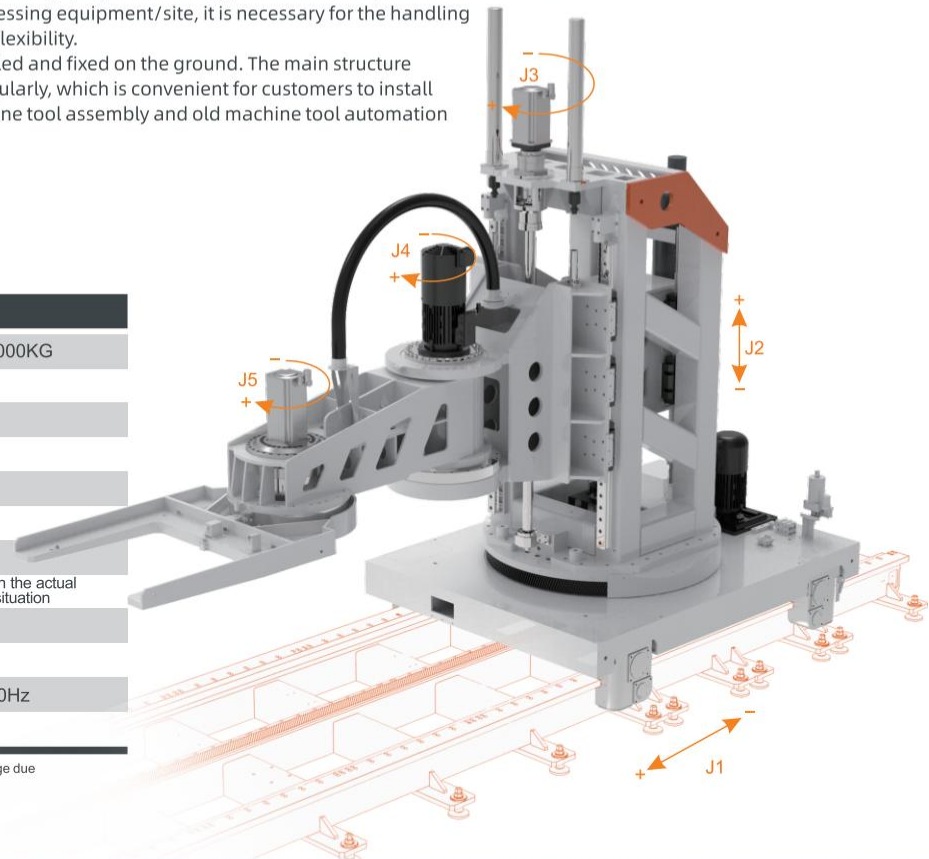
**Equipment features:** long arm extension, five axis linkage, high load lifting, J1 axis can be expanded in the future.

**Application conditions:** Due to limitations in processing equipment/site, it is necessary for the handling equipment to have long arm extension and high flexibility.

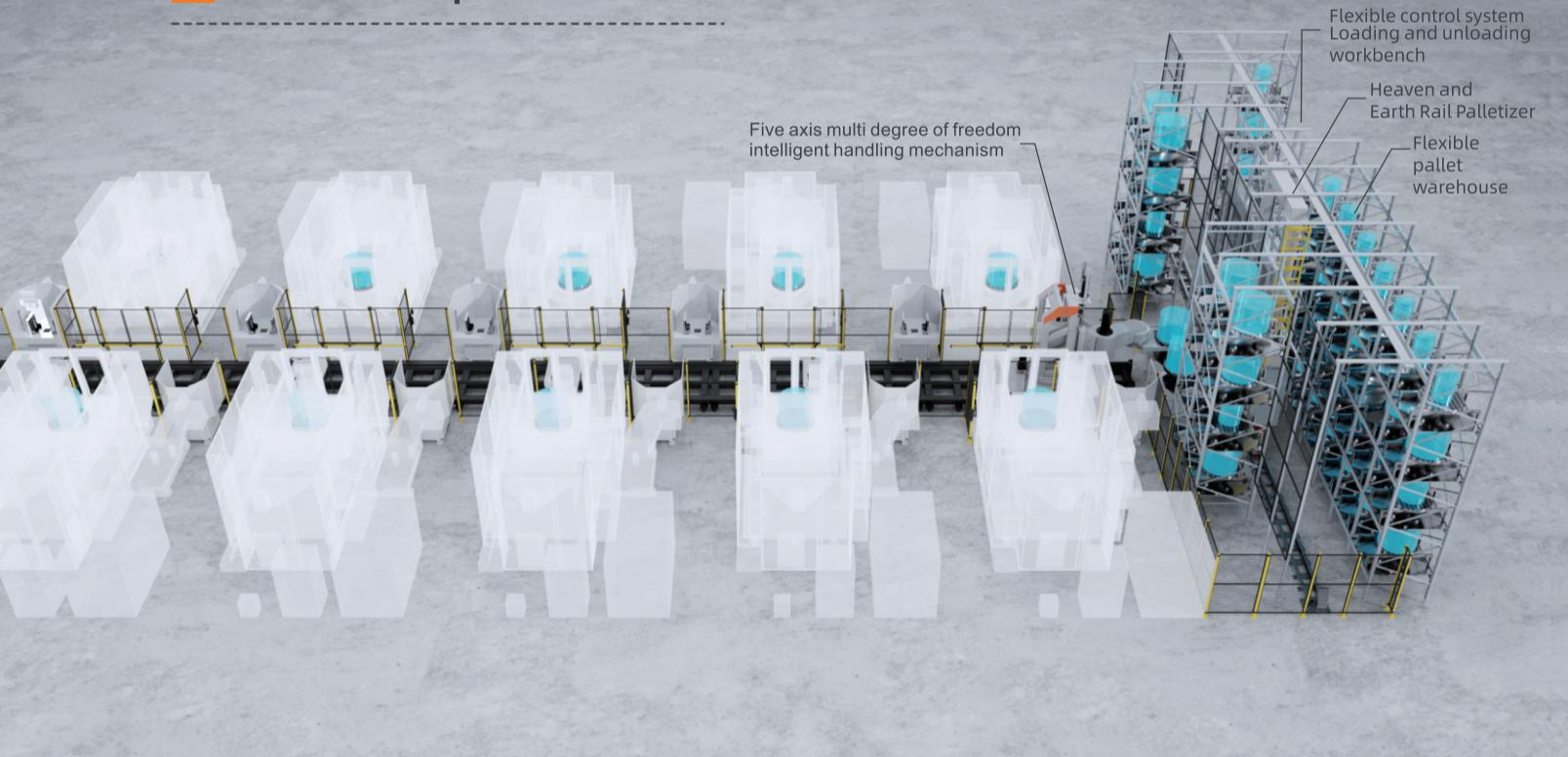
**Installation method:** The horizontal track is installed and fixed on the ground. The main structure and electrical control box can be assembled modularly, which is convenient for customers to install quickly on site and meets the needs of new machine tool assembly and old machine tool automation transformation.

Trans Master R20/R30 Parameter	
Maximum load	2000KG/3000KG
Fork arm extension	3950mm
J5 axis no-load disturbance	1mm
J5 axis full load disturbance	15±1mm
J5 axis repeat positioning accuracy	±1mm
J2 axis repeat positioning accuracy	±0.2mm
Maximum moving speed of j2 axis	6m/min
Total length of track	Depending on the actual deployment situation
Track repeatability accuracy	±0.2mm
Maximum moving speed of the track	30m/min
Power supply	3P 380V/50Hz
Control system	WELLIIH

Please note that the specifications and appearance are subject to change due to improvements or other reasons.



Scheme composition



Linear intelligent handling mechanism

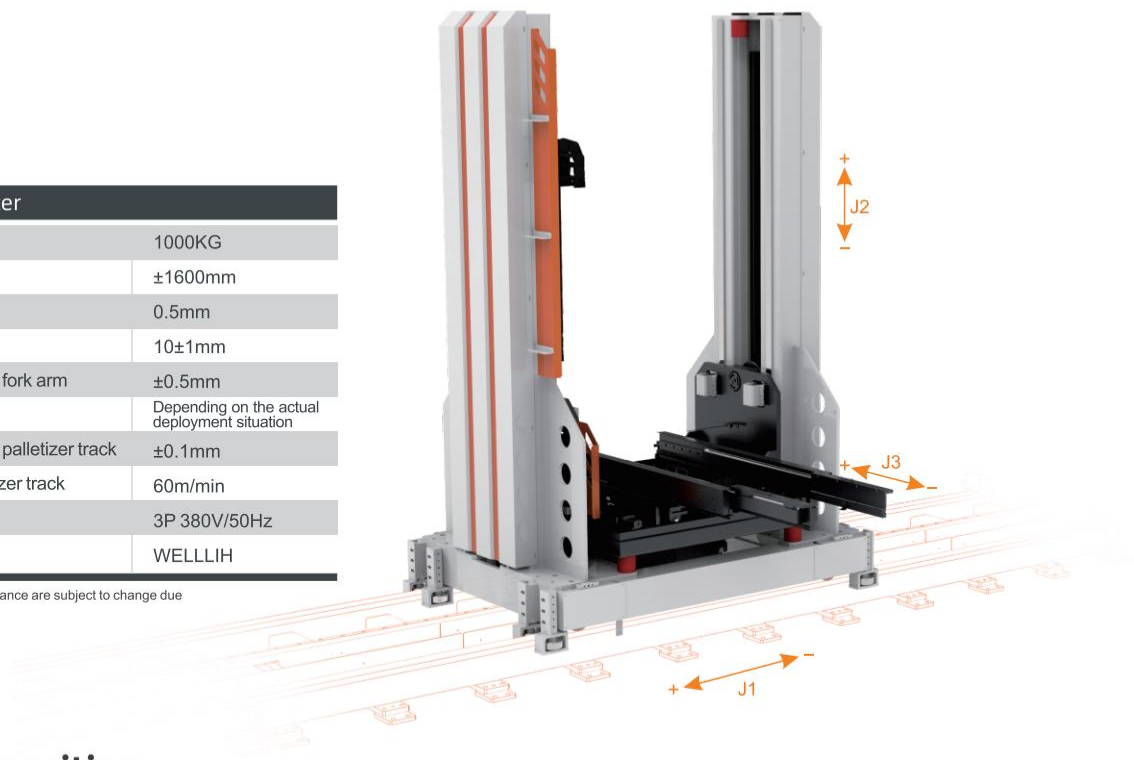
**Equipment features:** compact space, high load capacity, and support for track expansion in the future.

**Application conditions:** Due to limitations in processing equipment/site, it is necessary to transport equipment with a compact structure.

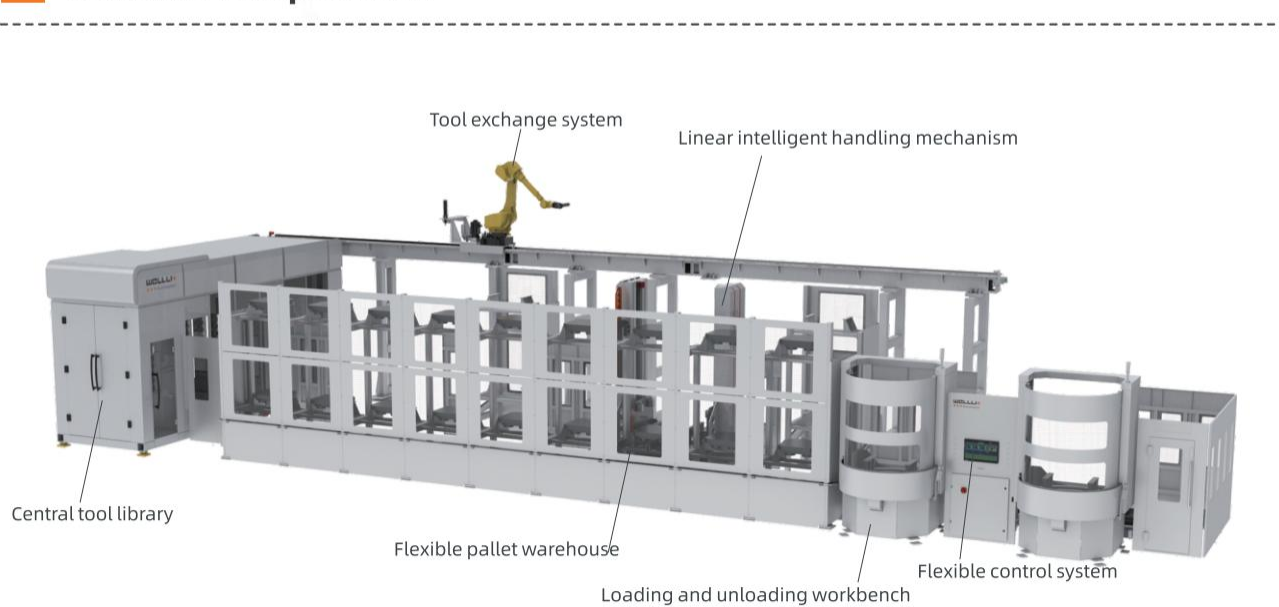
**Installation method:** The horizontal track is installed and fixed on the ground. The main structure and electrical control box can be assembled modularly, which is convenient for customers to install quickly on site and meets the needs of new machine tool assembly and old machine tool automation transformation.

Trans Master DT10 Parameter	
Maximum load of palletizer	1000KG
Palletizer fork arm extension	±1600mm
Forklift arm no-load deflection	0.5mm
Fork arm full load deflection	10±1mm
Repetitive positioning accuracy of fork arm	±0.5mm
Total length of palletizer track	Depending on the actual deployment situation
Repetitive positioning accuracy of palletizer track	±0.1mm
Maximum moving speed of palletizer track	60m/min
Power supply	3P 380V/50Hz
Control system	WELLIIH

Please note that the specifications and appearance are subject to change due to improvements or other reasons.



Scheme composition





Linear intelligent handling mechanism

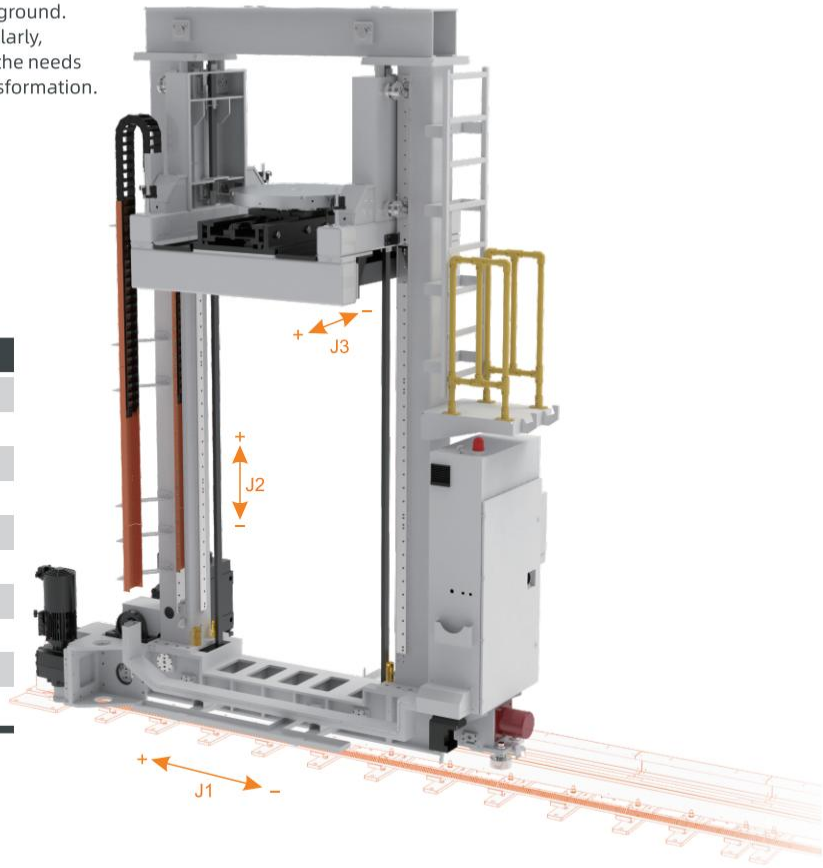
**Equipment features:** With a compact structure, the machine tool and material bin are closer together, and the space is compact. The form of sky and ground rails allows the handling mechanism to achieve higher lifting heights, and the rails can be expanded in the future.

**Application conditions:** Due to the limitations of processing equipment/site, in a limited footprint, it can be used in conjunction with multiple material warehouses to fully utilize space resources and obtain larger reserves.

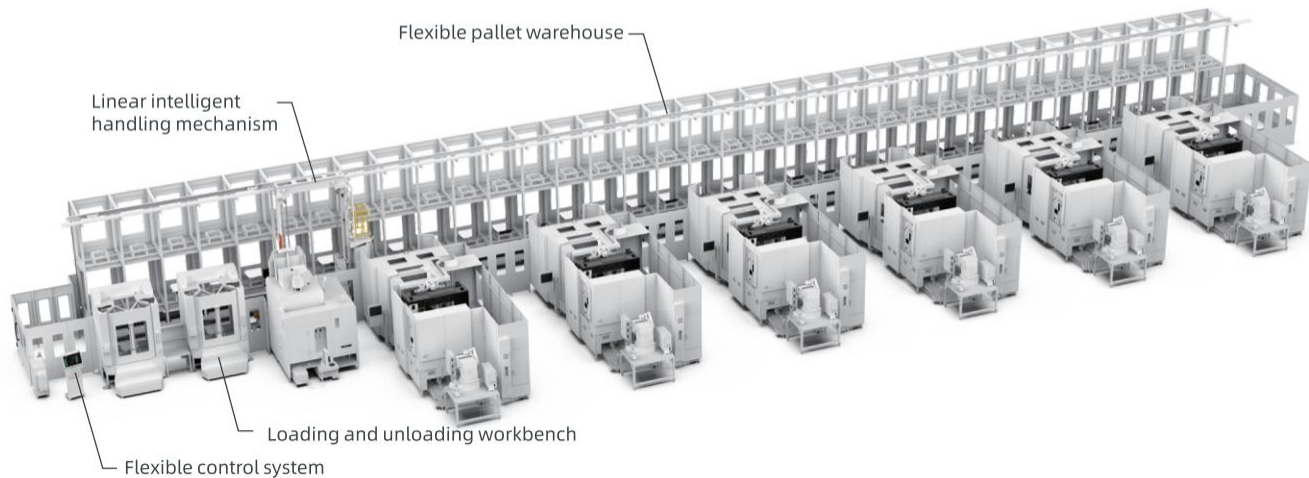
**Installation method:** The horizontal track is installed and fixed on the ground. The main structure and electrical control box can be assembled modularly, which is convenient for customers to install quickly on site and meets the needs of new machine tool assembly and old machine tool automation transformation.

Trans Master T10 Parameter	
Maximum load of palletizer	1000KG
Palletizer fork arm extension	±1800mm
Forklift arm no-load deflection	2±0.2mm
Fork arm full load deflection	10±1mm
Repetitive positioning accuracy of fork arm	±1mm
Total length of palletizer track	Depending on the actual deployment situation
Repetitive positioning accuracy of palletizer track	±0.5mm
Maximum moving speed of palletizer track	60m/min
Power supply	3P 380V/50Hz
Control system	WELLLIH

Please note that the specifications and appearance are subject to change due to improvements or other reasons.



Scheme composition



Linear intelligent handling mechanism

**Equipment features:** With a compact structure, the machine tool and material bin are closer together, and the space is compact. The form of sky and ground rails allows the handling mechanism to achieve higher lifting heights, and the rails can be expanded in the future.

**Application conditions:** Due to the limitations of processing equipment/site, in a limited footprint, it can be used in conjunction with multiple material warehouses to fully utilize space resources and obtain larger reserves.

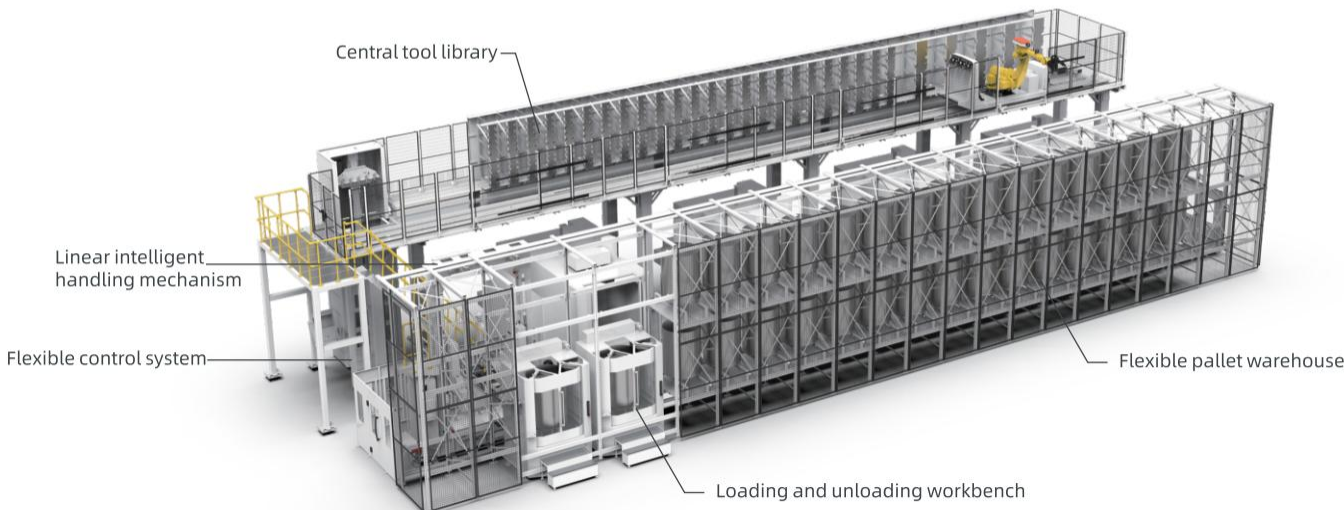
**Installation method:** The horizontal track is installed and fixed on the ground. The main structure and electrical control box can be assembled modularly, which is convenient for customers to install quickly on site and meets the needs of new machine tool assembly and old machine tool automation transformation.

Trans Master T20/T30 Parameter	
Maximum load of palletizer	2000KG/3000KG
Palletizer fork arm extension	±1800mm
Forklift arm no-load deflection	2±0. 2mm
Fork arm full load deflection	15±1mm
Repetitive positioning accuracy of fork arm	±1mm
Total length of palletizer track	Depending on the actual deployment situation
Repetitive positioning accuracy of palletizer track	±0.5mm
Maximum moving speed of palletizer track	60m/min
Power supply	3P 380V/50Hz
Control system	WELLLIH

Please note that the specifications and appearance are subject to change due to improvements or other reasons.



Scheme composition





### Drag and drop heavy-duty handling mechanism

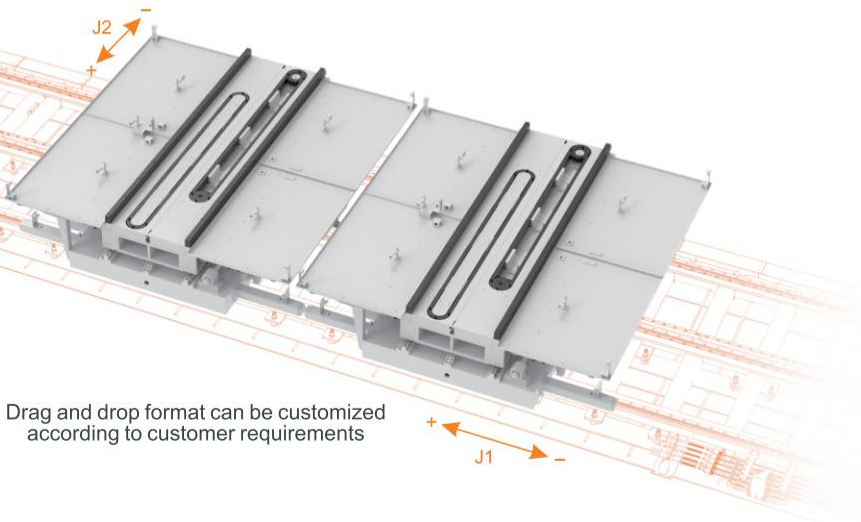
**Equipment features:** Large load handling, drag and drop mechanism, track support for expansion.

**Application conditions:** Suitable for multi machine automation for handling heavy loads.

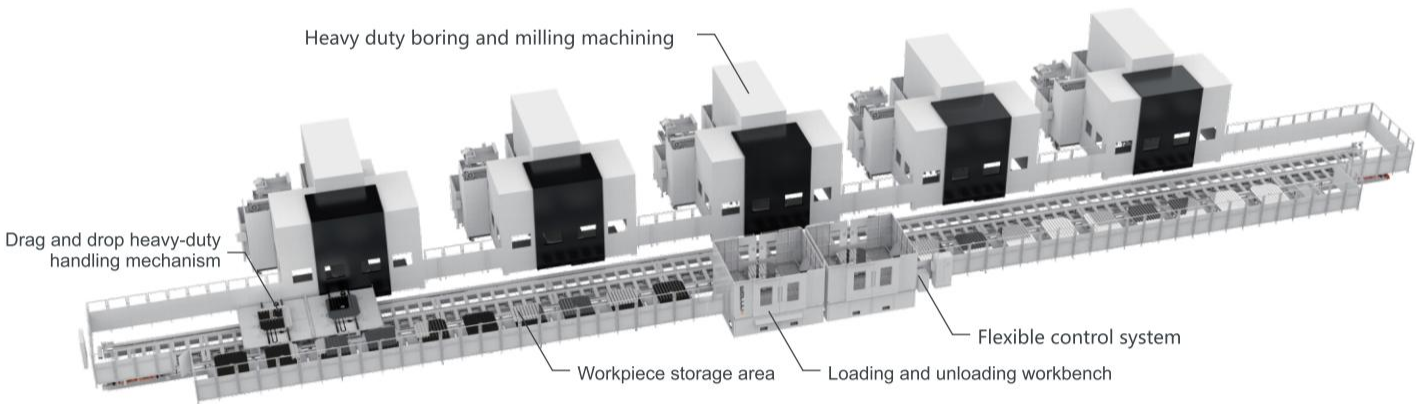
**Installation method:** The horizontal track is installed and fixed on the ground. The main structure and electrical control box can be assembled modularly, which is convenient for customers to install quickly on site and meets the needs of new machine tool assembly and old machine tool automation transformation.

Trans Master M500/1000 Parameter	
Maximum load of stacker	50000kg /100000kg
Track length	Depending on the actual deployment situation
Track repeatability accuracy	±0.5mm
Maximum moving speed of the track	30m/min
Power supply	380V/50HZ/3 phases
Control system	WELLIIH

Please note that the specifications and appearance are subject to change due to improvements or other reasons.



### Scheme composition

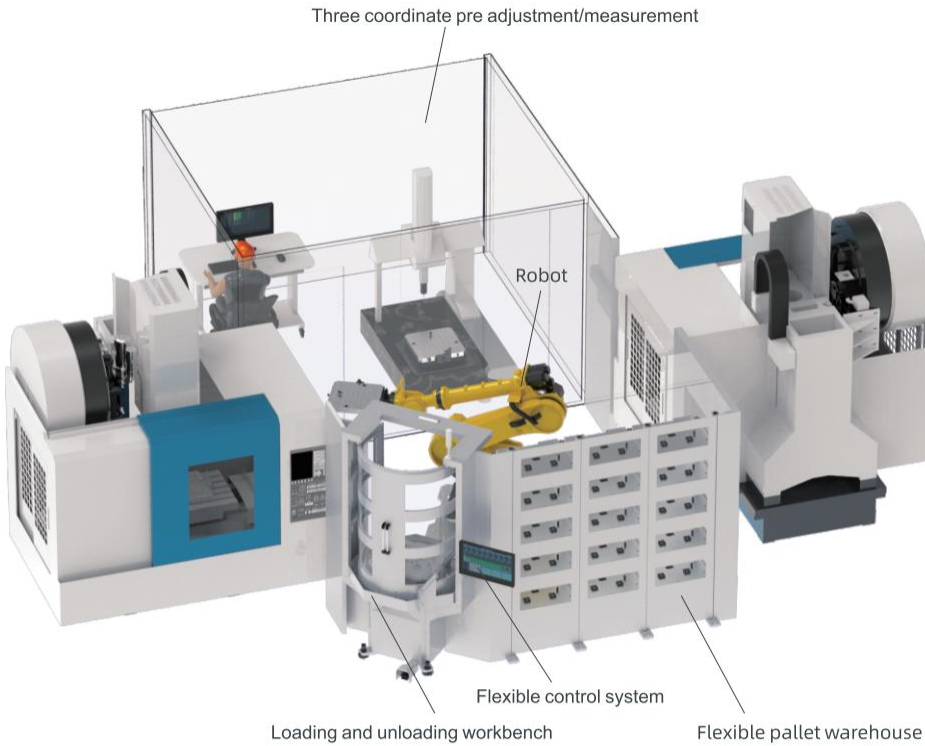
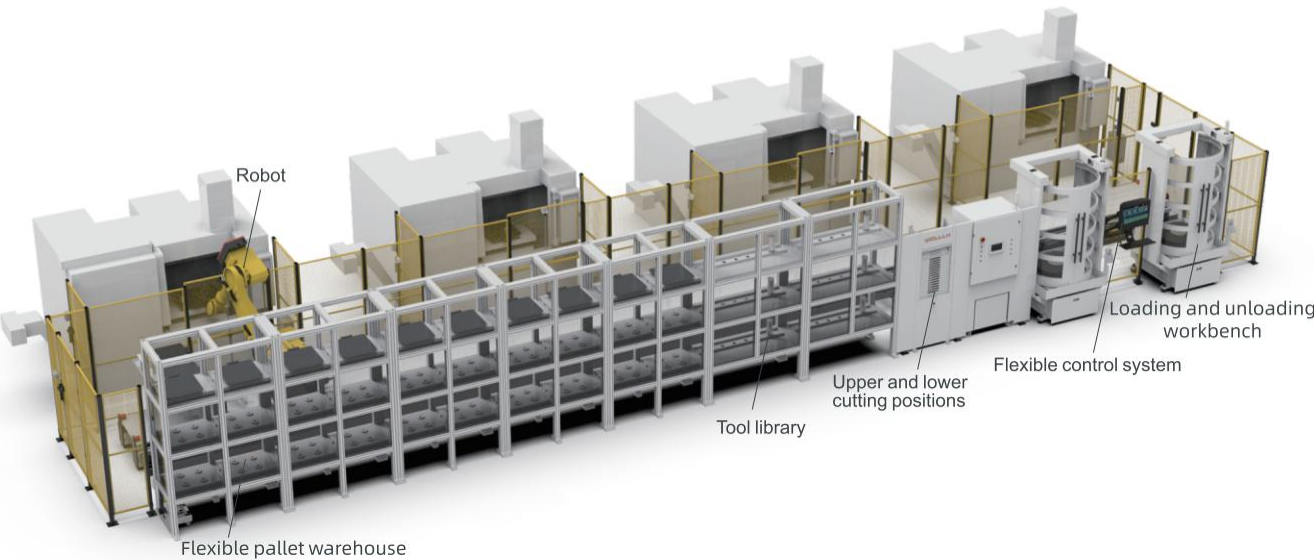


### Robot DFMS solution

**Equipment features:** Select mainstream articulated robots in the market, with a load of 20KG-250KG.

**Application conditions:** It is widely used in scenarios of multi variety, small batch, or mixed line production by transporting joints through ground rails.

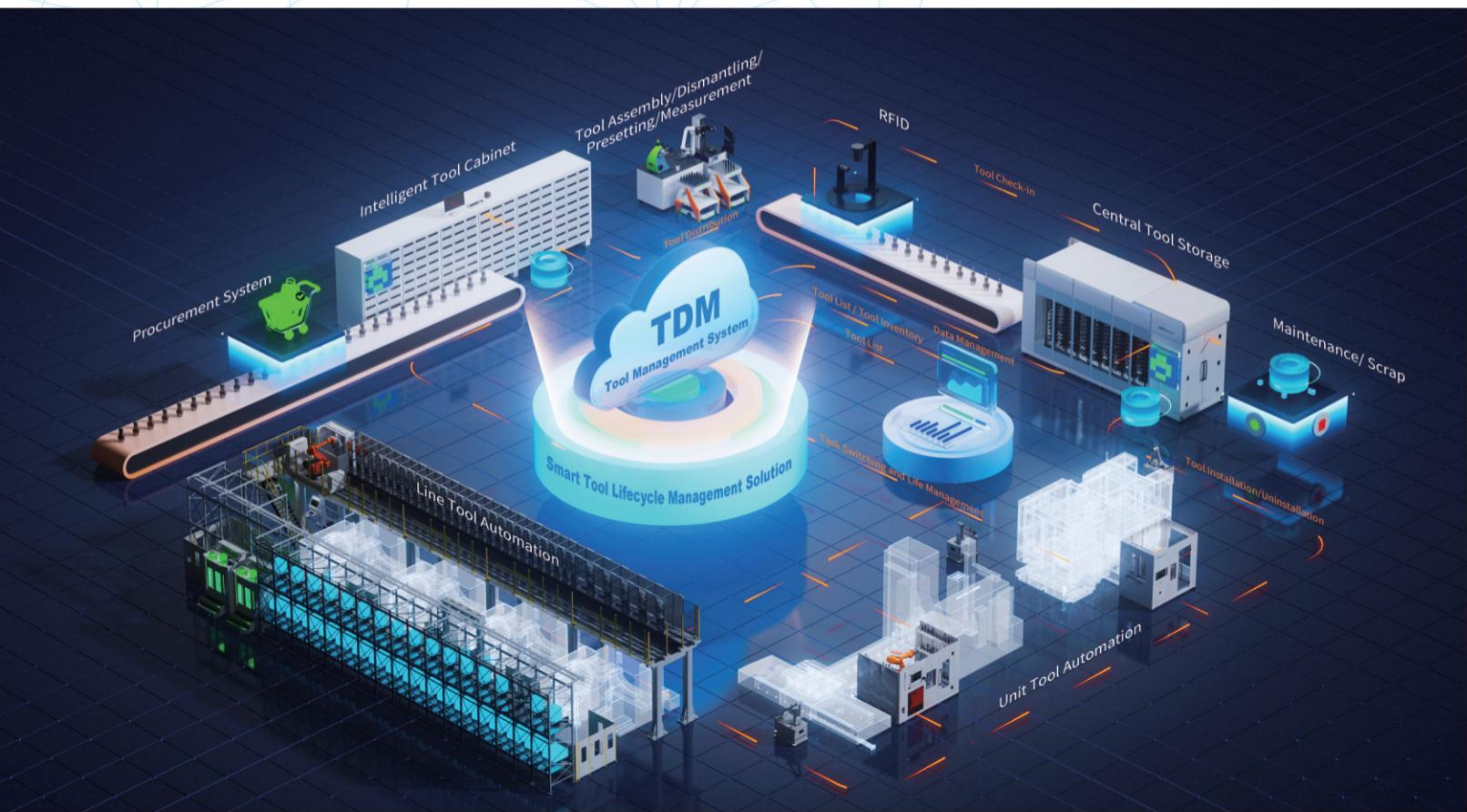
**Installation method:** The horizontal track is installed and fixed on the ground. The main structure and electrical control box can be assembled modularly, which is convenient for customers to install quickly on site and meets the needs of new machine tool assembly and old machine tool automation transformation.





# TDM Tool Management System

## Smart Tool Lifecycle Management Solution



### Intelligent central tool library

- Expandable machine tool library capacity to solve the problem of repeated tool replacement due to tool shortage in multi-workpiece machining
- Realize tool sharing among multiple machine tools, reduce costs, and improve utilization
- Seamless integration with machine tools and machine tool libraries to achieve tool automation
- Significantly extend unmanned production time and save repetitive labor
- Tool life management, real-time traceability of tool information

### Shelf style central tool warehouse

The tool library is built above the machine tool to save space and increase storage capacity. The cutting tools are stored centrally and transported to the machine tool by robots.



### Matrix style central tool library

Matrix style central tool library layout, with tools accessible on both sides, compact structure; Integrated design, fast installation and deployment; Linear high-speed tool changing mechanism, stable and precise.

### Single machine expansion tool library

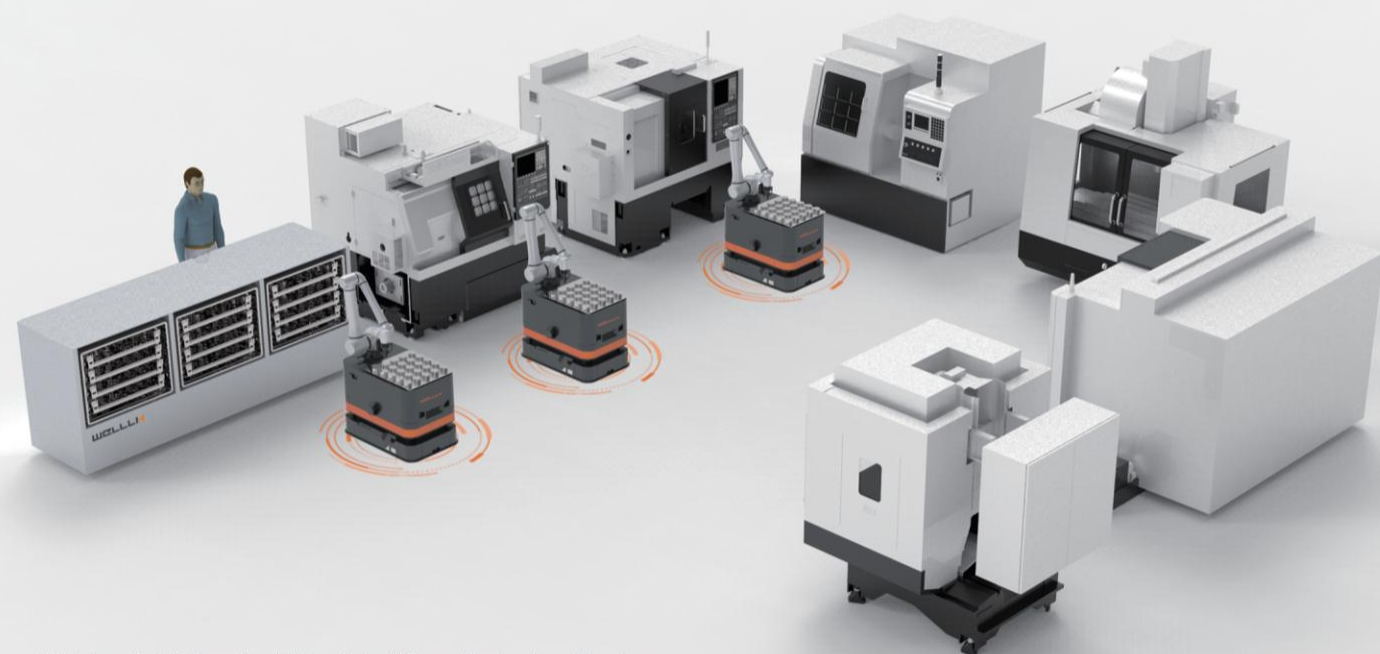
Integrated design, quick installation and deployment, minimal machine tool modification

## Containerized Central Tool Magazine

20ft/40ft Standard mod





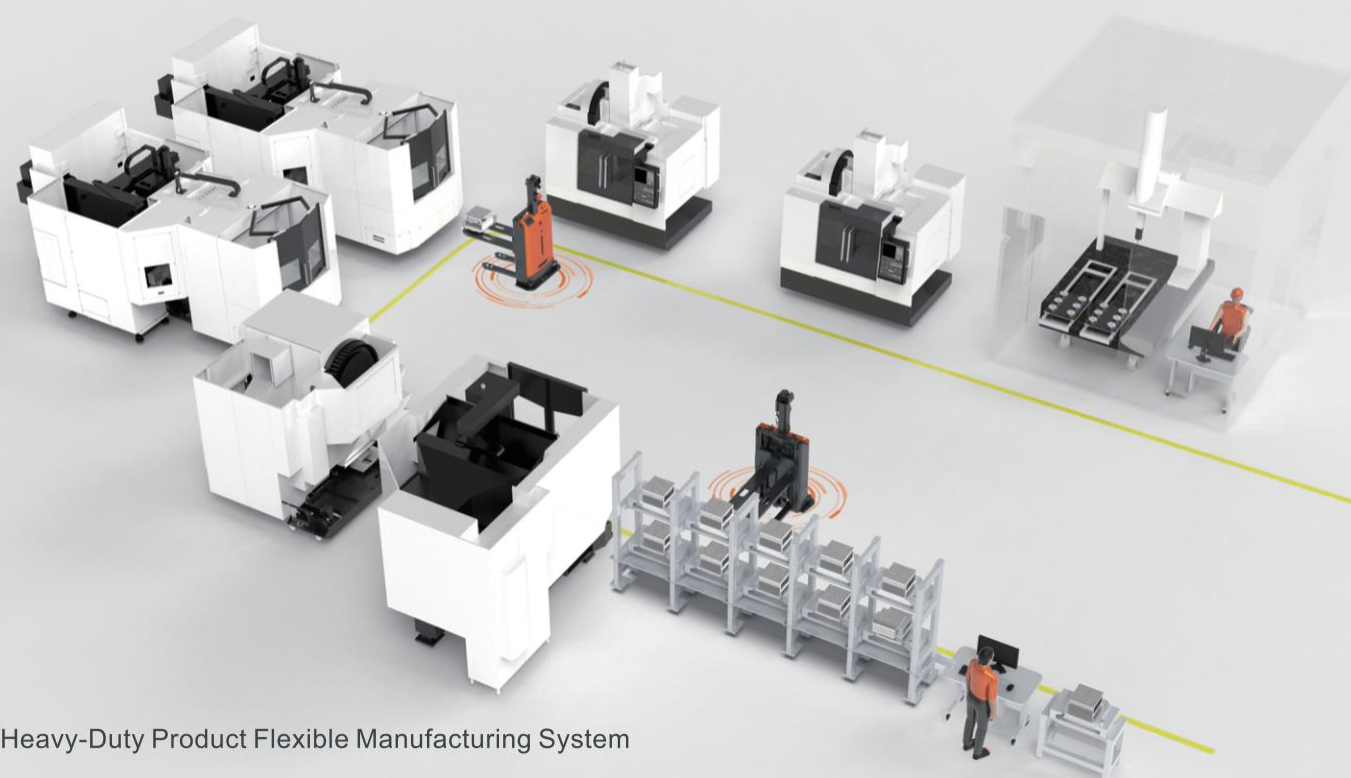


Lightweight Product Flexible Manufacturing System

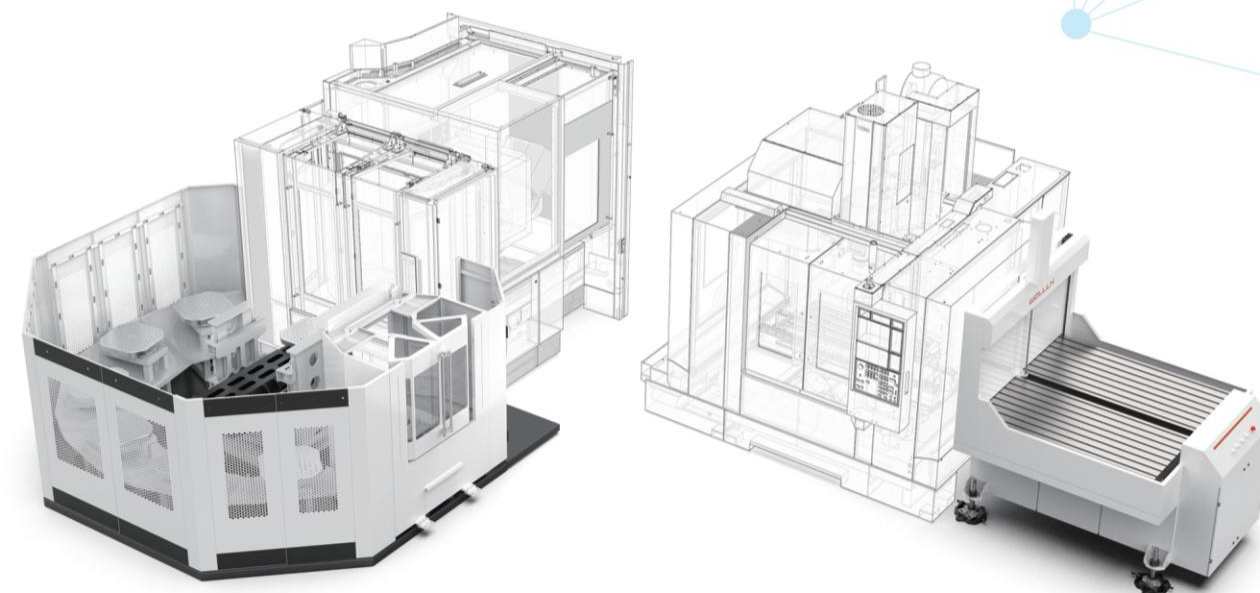
### More open and collaborative flexible manufacturing system

Truly achieve efficient collaboration in flexible manufacturing

- ◆ Not limited by space, no need to rearrange machine tools or adjust layouts, compatible with a wide range of new and old equipment
- ◆ Personnel and equipment can collaborate in an open environment without interfering with each other
- ◆ Handling mechanisms have high flexibility and safety, capable of automatic obstacle avoidance and path planning
- ◆ Automatic loading and unloading of machine tools, with automatic issuance of matching machining programs
- ◆ Integration with tool life management for automatic scheduling and control
- ◆ The digital management system can automatically calculate and consider the "man-machine-material-method-environment" elements based on on-site resources, providing comprehensive guidance and predictions for production planning and on-site operations
- ◆ The software system can be continuously iterated and updated, reducing costs and resource wastage



Heavy-Duty Product Flexible Manufacturing System



APC flexible manufacturing unit

## WELLIH Solutions/Manufacturing Optimization



### Solution Consulting

From the initial planning to the final production operation, Provide professional and personalized overall consulting services based on customer needs



### Flexible Control Software

Provide a customizable modular manufacturing execution control system, Unified execution and operation interface to achieve automation of production and management



### Automated System

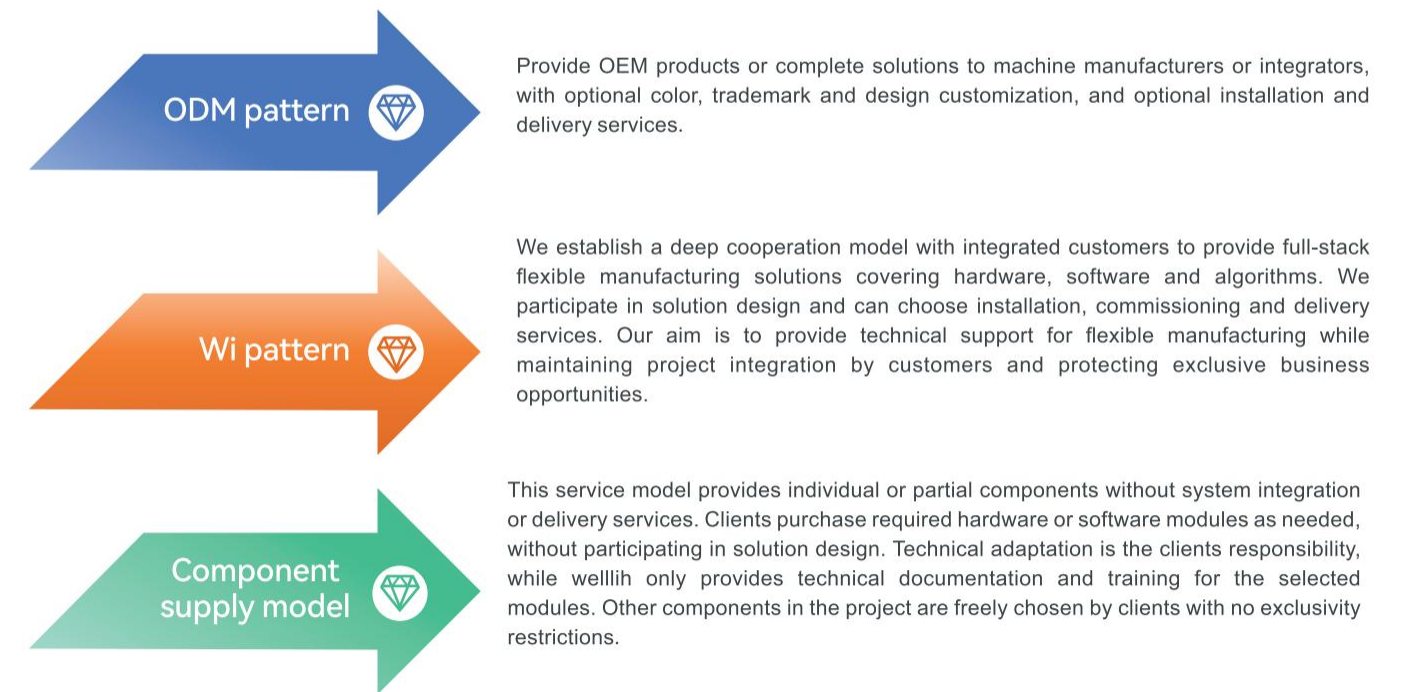
From pallet handling systems to robotic arm units, or complex tooling The self extraction system can provide a complete turnkey solution for all items



# Leading Expert in Flexible Manufacturing

## WELLLIH Product Matrix And Cooperation Mode

The core is "**hardware matrix + intelligent software + scenario-based service**", and it deeply cultivates its position as an "**expert in flexible manufacturing**", deeply empowers ecological partners, and helps the manufacturing industry to transform into the paradigm of "mass customization".



### Flexible management system

Flexible manufacturing control management system unified, with accurate scheduling flexible connectivity and intelligent decision making ability, modularity, by it needs to be selected.



### Sports control platform

High stability and ease of use. can adapt to the mainstream market drive and motors, kinematics and motion the support of mechanical model is accurate secure, rapid deployment.



### Moving agencies

Designed for industrial scenarios, it has a lot of load linearity and a multi-degree-of-freedom handling mechanism, complete specifications, high precision, high reliability.



### Load system

It has various forms and functions rich, friendly and safe manned or unmanned loading systems.



### Inventory system

High load capacity and stability, at the same time, through modular design, rapid installation and deployment can be achieved.

