



**PARALLEL  
KINEMATIC  
MODULE**

**PKM**



# Innovative Kinematic-Technology

## **PKM-st** (telescopic swivel head)

A-axis:  $\pm 50^\circ$   
B-axis:  $\pm 50^\circ$



Spindle power  
for both variants  
up to 20kW.

## **PKM-hv** (2 axis milling head)

A-axis:  $\pm 120^\circ$   
C-axis:  $\pm 360^\circ$

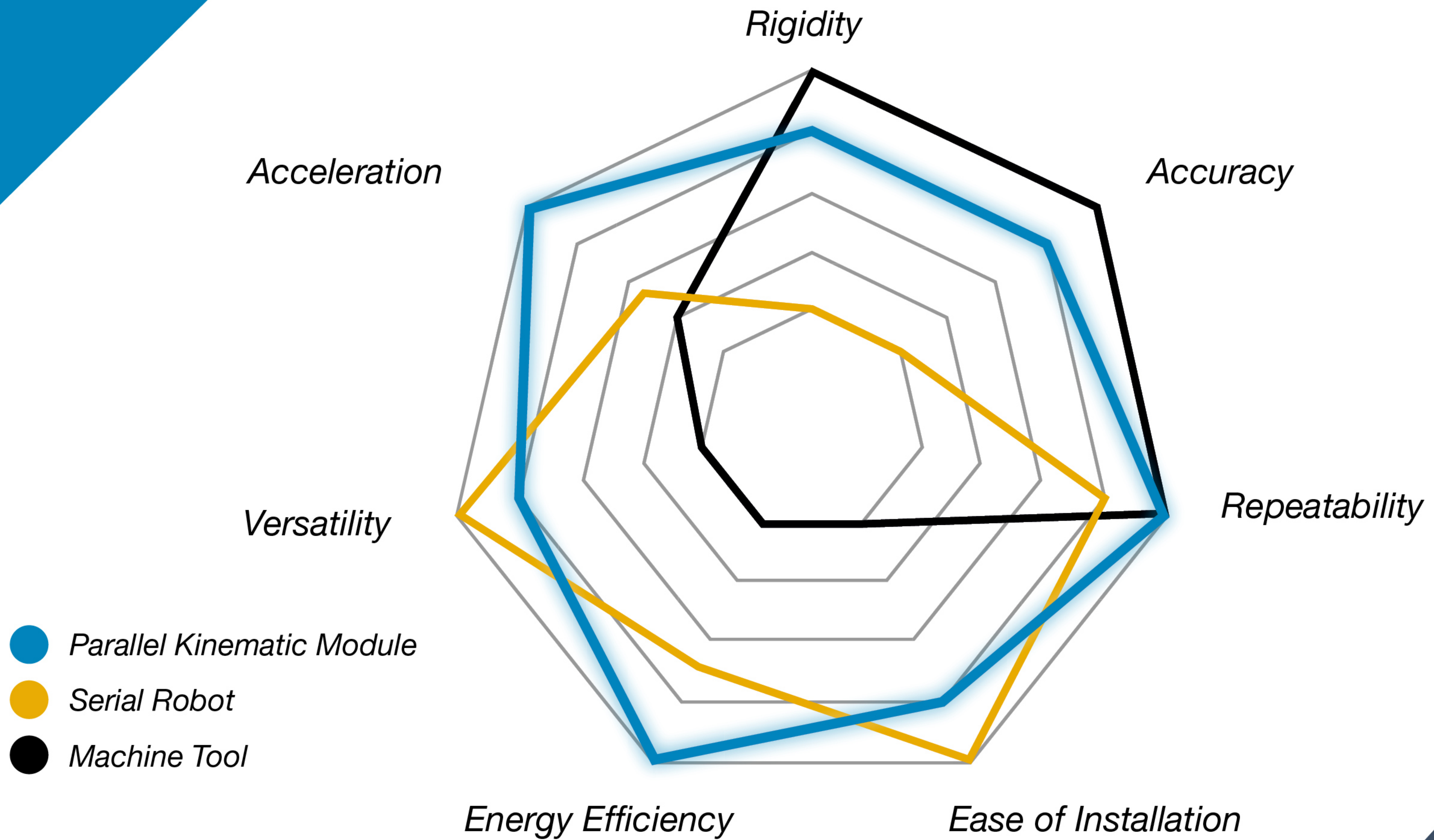


## Structure & Functionality

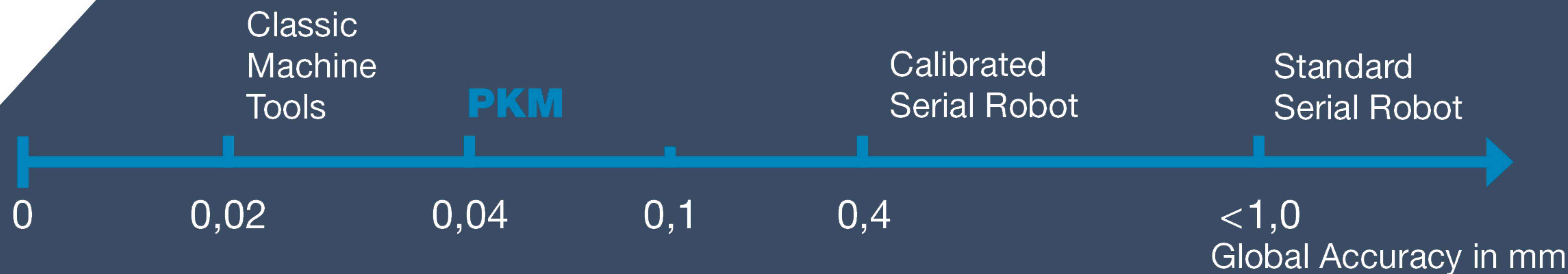
The application carrier is connected to the three carriages via carbon rods and backlash-free cardan joints. The master-slave coupled drives of the carriages are also backlash-free and are equipped with direct encoders if required. 5-axis simultaneous CNC-Machining is standard on both variants.



# Comparison of the Systems



- Parallel Kinematic Module
- Serial Robot
- Machine Tool







### **Energy Efficient Dynamics**

A weight-optimized construction driven by a unique kinematic enables not only high dynamic movements (170m/min, 2.5g), but also a more energy sustainable process.



### **Modular & Configurable**

Workspace size and base frame orientation are configurable according to project-specific requirements (Y-axis max. 3m, Z-axis max. 2m, X-axis unlimited).



### **Precise & Accurate**

Through unique calibration and compensation methods a repeatability  $\leq 5\mu\text{m}$  and an average path accuracy  $\leq 40\mu\text{m}$  without process forces can be achieved in the entire workspace. TCP stiffness values up to 10 N/ $\mu\text{m}$  in average.



### **Powerful**

Despite the lightweight structure, the available process load is comparable to machine tools ( $\leq 10\text{kN}$  radial / axial).



### **Flexible Applications**

The application carrier can be configured for additive or subtractive manufacturing processes, as well as for metrology applications.



### **Ease of Use**

Market proven CNC control with seamless integration in CAM environments. No special robot knowledge is required.



# Agile Machine Calibration and Compensation

With help of a laser measurement system the machine automatically generates a point cloud in the workspace. By implementing machine learning methodologies, the kinematic algorithm determines the machine geometry and compensates for orientational deviations. As a result a repeatability of 5 $\mu$ m and path deviation of less than 40  $\mu$ m in the entire workspace volume will be achieved.

## Application Examples

### Possibilities of Application:

- Metal machining
- Milling / Drilling
- CFRP machining / laying
- Laser cutting / welding
- Laser deposition welding
- Deburring
- and more to come



### Media Downloads





# About Us

We established a partnership between ELHA and Cognibotics to offer unique innovative manufacturing solutions.

ELHA as a settled machine tool builder and Cognibotics as an expert for robot engineering, combine their competence fields to breakthrough conventional trends.

Our philosophy is to develop together with our customers process solutions for the manufacturing environment of the future.

**energy efficient – modular – configurable**  
**precise – dynamic – flexible applications**

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