



# AEROTECH

Dedicated to the Science of Motion Since 1970

## Precision Motion Control and Automation Solutions

Motors, Drivers, Controllers, Stages, Systems

ISO 9001 Registered as of 1995

**Aerotech Worldwide**

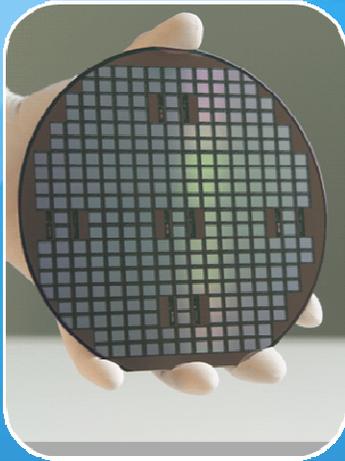
United States • Germany • United Kingdom • Japan

Aerotech... Your Worldwide Partner in Advanced  
Motion Control and Automation Solutions



[www.aerotech.com](http://www.aerotech.com)

## Major Markets Served by Aerotech



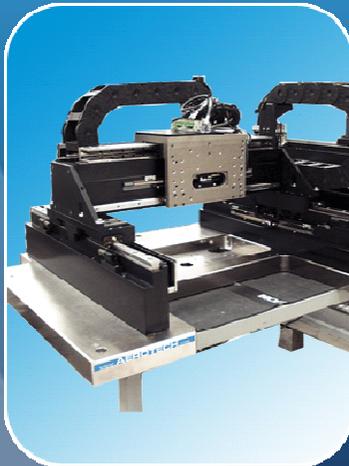
Semiconductor, Flat Panel  
Electronics Manufacturing



Medical Device  
and Life Sciences



Laser Processing



Test and Inspection  
Packaging automotive



Defense, Space,  
Aeronautic



Education, Research  
Government labs

# Standards mechanics

Translations, Rotations, Z, X, XY, XY gantry

Air bearing stages  
Direct drive



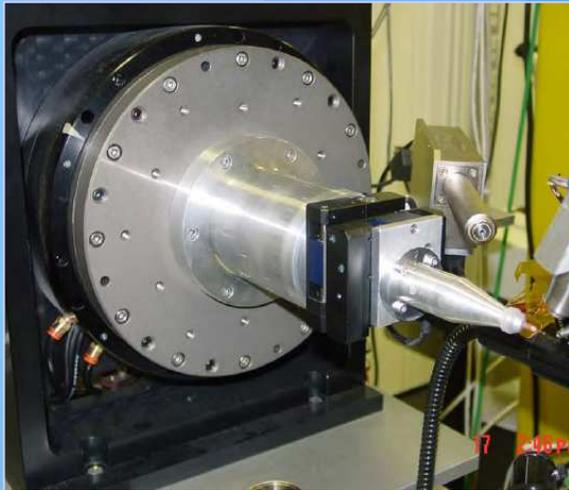
Mechanical bearing stage  
Direct drive



Mechanical bearing stage  
Screw driven



## Rotation know how Large cradle-Large rotation-spindle



- Slip rings integration
- Linear driver (highest stability at low speed)
- Ultra high precision encoder
- Absolute encoders
- Home position programmable
- Air bearing for COC less than 100nm



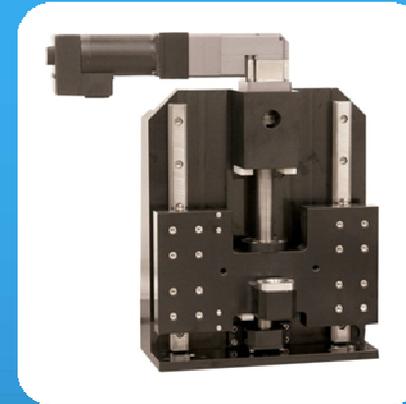
6000 RPM



350mm aperture

## Heavy load XY and Z

- VTS300 Vertical Translation Stage Positions
- 450kg load carrying capability
- Set and forget operation mode (lead screw)
- 0.064  $\mu\text{m}$  Resolution
- $\pm 10 \mu\text{m}$  bi-directional repeatability
- $\pm 25 \mu\text{m}$  accuracy
- Vacuum compatible



**High Load, Ball Screw,  
XY Linear Stages**

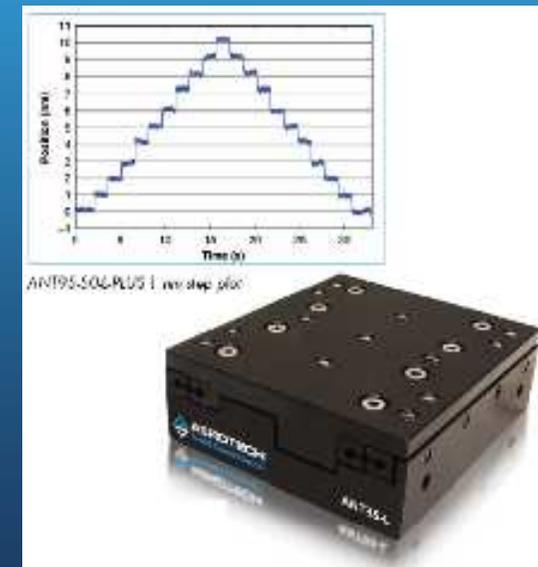
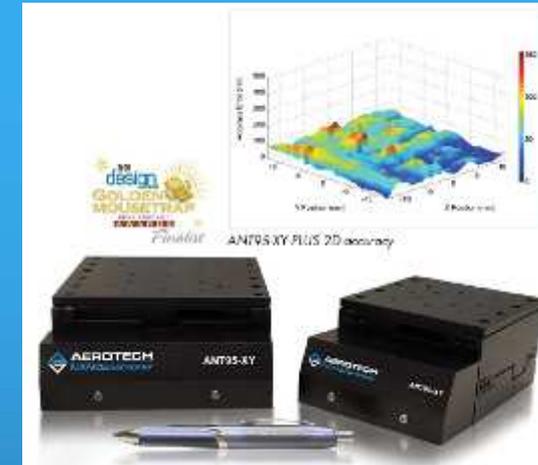
- Payloads up to 1500 lb (682 kg)
- Optional linear encoders for high accuracy and repeatability
- Cleanroom or Vac  $10^{-6}$  torr compatible



**High Load X/Theta**

- 350 mm travel
- Continuous rotation
- 1500 lb (682 kg) load
- $\pm 10 \mu\text{rad}$  rotary accuracy
- Cleanroom or Vac  $10^{-6}$  torr compatible

- Single axis and integrated XY
  - Travels from 25 mm to 160 mm
  - 1 nm repeatable step size
  - <1 nm in position stability
  - 50 nm repeatability
  - Vertical and horizontal mounting
- Rotary and Goniometer
  - 0.01 arcsec (0.05  $\mu$ rad) step size
  - 0.005 arcsec (0.025  $\mu$ rad) in-position stability
  - 0.5 arcsec (2.5  $\mu$ rad) repeatability
  - Multi-axis configurations



# Custom systems

Translation, Air bearing, integration



# Industry Solutions Systems



AB-assembly



3-axis fiber alignment system



IOL and Contact lens machining



Surface measurement motion platform



PV scribing machine



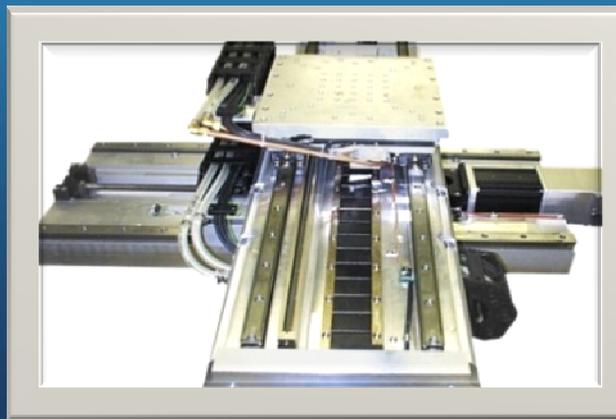
Cylindrical machining center

## Vacuum and cleanliness know how

- Three vacuum level options:
  - Standard low Vacuum Option ( $10^{-3}$  torr)
  - Standard high Vacuum Option ( $10^{-6}$  torr)
  - Custom ultra High Vacuum Option ( $>10^{-8}$  torr)



- Cleanroom assembly
  - Class 1000
  - class 10 under hutch



# Universal drivers

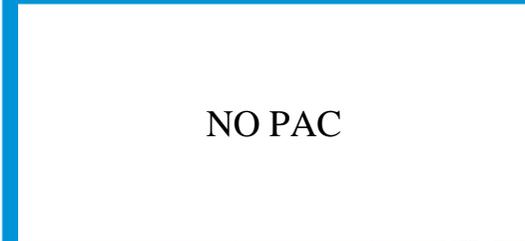
PWM or Linear drivers, DC or AC input, 10 to 150A  
up to 320V DC Output for stepper, DC or brushless motors



A3200 family  
Firewire Aerotech network  
MP, CP, HPE, 8-axes  
NPAQ  
Nmark for SCANNERS  
TRIPLE-PSO output  
Sensor Fusion



Ensemble family  
Ethernet Aerotech network  
MP, CP, HPE, 8-axes  
EPAQ  
4 or 8-axes EPAQ-MR  
DUAL-PSO output



Soloist family  
Ethernet customer network  
MP, CP, HPE  
PSO output

# Controller software

Real-time, modular, Help online, Advanced tuning function  
Librairies .net, C++, VB, Labview

## **A3200 controller**

PC based  
Synchronization of 32-Axis

### Main Modules

Configuration manager  
Motion composer  
Digital Scope  
Motion Designer

### Programmation interfaces

Aerobasic, G-code  
Labview  
PLC MotionPac

### Advanced interfaces

Motion simulator  
CNC Operator Interface  
CADFUSION  
TANGO & EPICS

## **ENSEMBLE controller**

Standalone  
Synchronisation of 10 axis

### Main Modules

Configuration manager  
Motion composer  
Digital scope  
Motion Designer

### Programmation interfaces

Aerobasic  
Labview  
TANGO & EPICS

## **SOLOIST controller**

Standalone  
Mono axis

### Main Modules

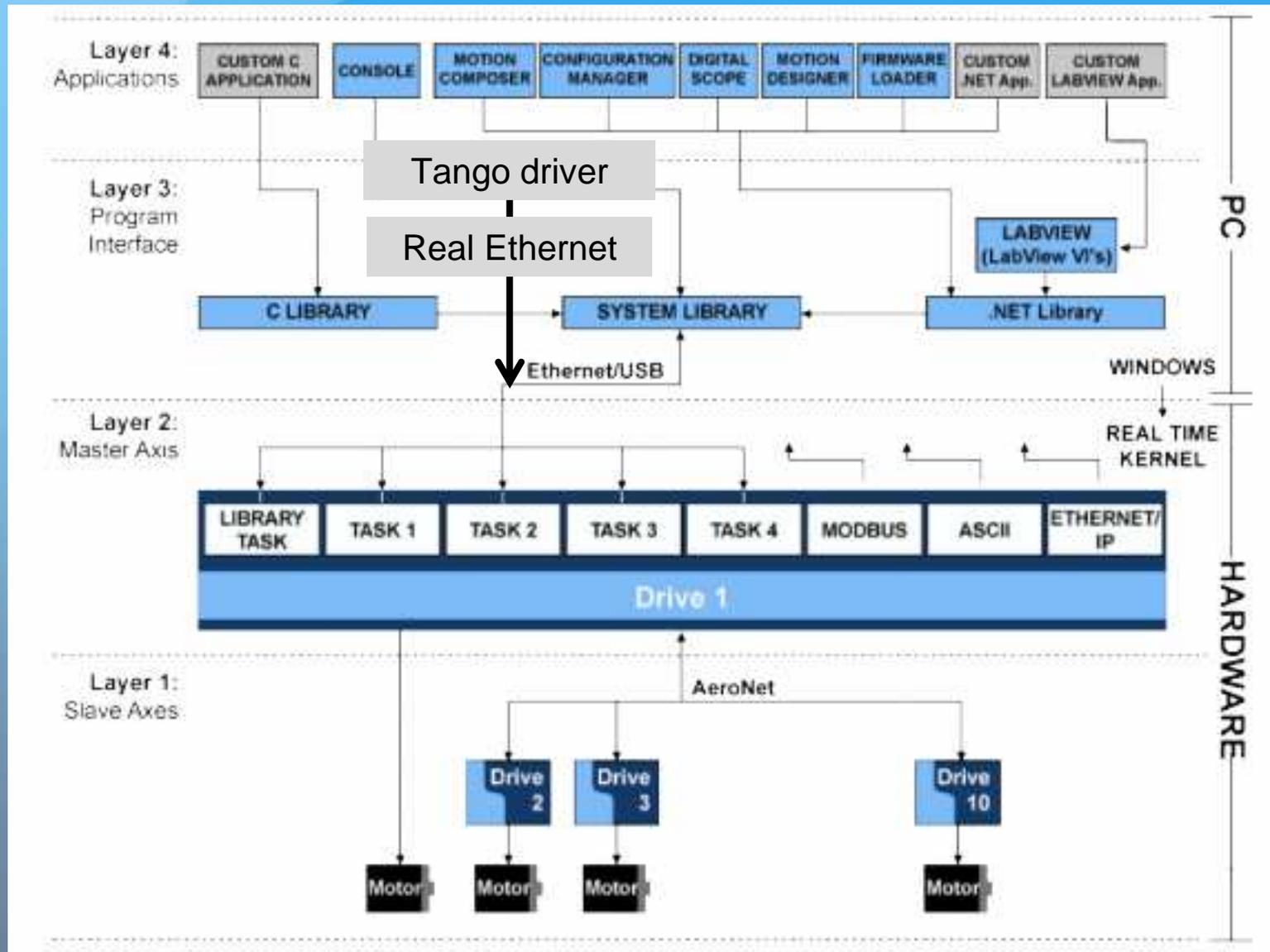
Configuration manager  
Motion composer  
Digital scope  
Motion Designer

### Programmation interfaces

Aerobasic  
Labview

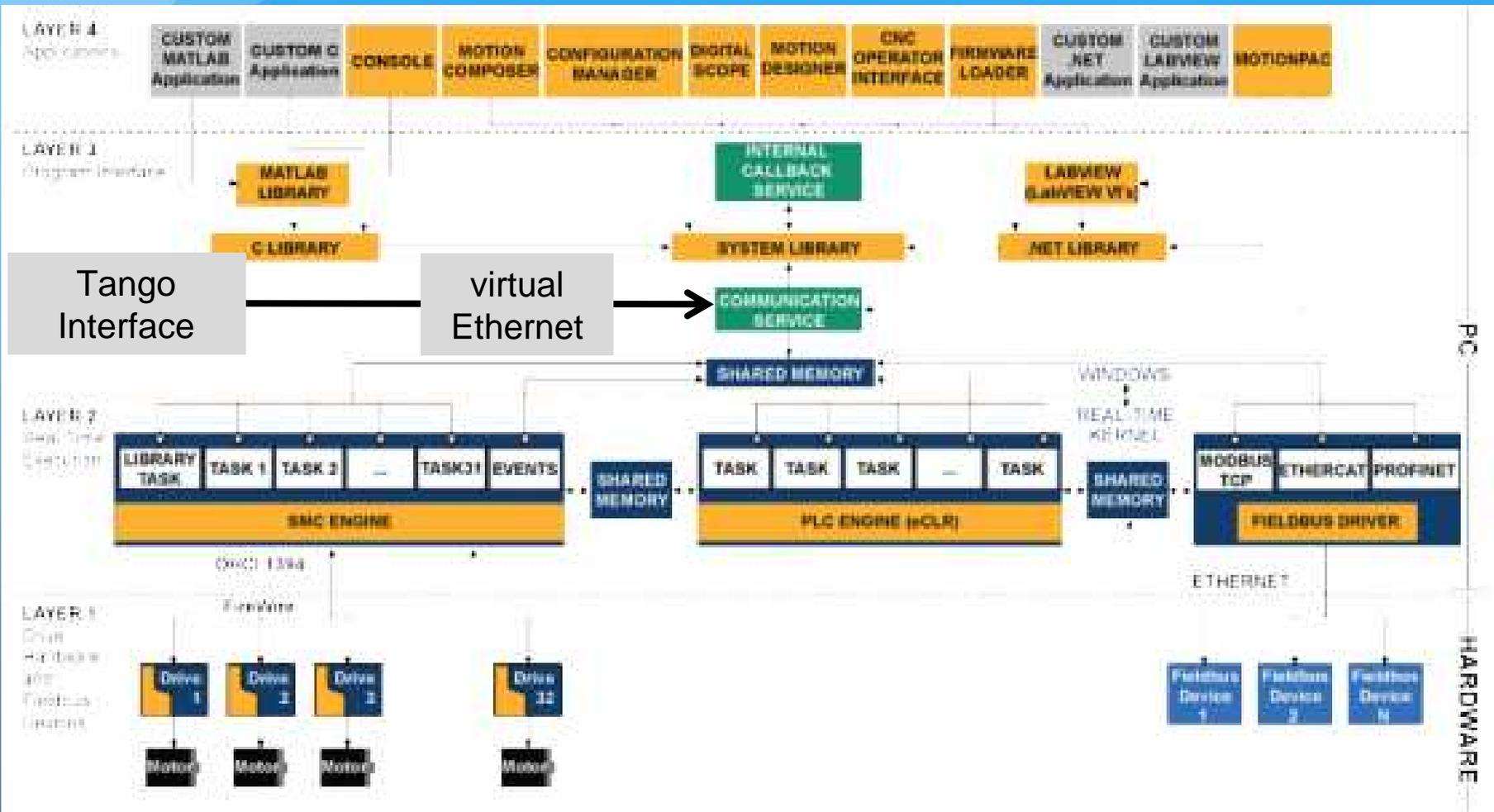


# Ensemble architecture and Tango





# A3200 architecture and Tango





## TANGO interfaces Aerotech controllers

- ASCII Interface of A3200 & ENSEMBLE
- Ethernet communication
  - Between customer PC and controller
  - Written with library YAT (open source software)
- 4 C++ classes : <http://tango-ds.cvs.sourceforge.net/viewvc/tango-ds/Motion/Aerotech/>
  - Aerotechbox (one per controller)
  - AerotechAxis (one per axis)
  - A3200Expert (A3200 syntax)
  - EnsembleExpert (Ensemble syntax)



# Tango IHM

The screenshot displays three windows of the Tango IHM software, each titled 'AtkPanel 4.2'.

- Left Panel (jean/Aerotech/A3200Axis.1):** Shows status indicators: 'Axis Enabled', 'Brake OFF', 'Axis Homing Done', and 'Axis in position'. Below are control fields for Position (0.00 No unit), Offset (0.00 No unit), Velocity (20.00 No unit), isBrakeOn (checkbox), and relative move (0.00 No unit).
- Middle Panel (jean/Aerotech/A3200Expert.1):** Shows status indicators: 'Axis Enabled', 'Brake OFF', 'Axis Homing Done', and 'Axis in position'. Below are control fields for positionError (0.00 No unit), currentVelocity (0.00 No unit), lowLimit (0.00 No unit), highLimit (0.00 No unit), rampRate (200.00 No unit), homeVelocity (20.00 No unit), homeOffset (0.00 No unit), raw status value (4194317.00 No unit), and raw error value (0.00 No unit).
- Right Panel (jean/aerotech/A3200Box.1):** Shows status indicators: 'device is up and running', 'communication opened', and 'Controller TYPE : <A3200>'. Below are control fields for commandes acceptées (18532 No unit) and commandes refusees (0.00 No unit).

Each panel includes a 'Scalar' button at the bottom left.