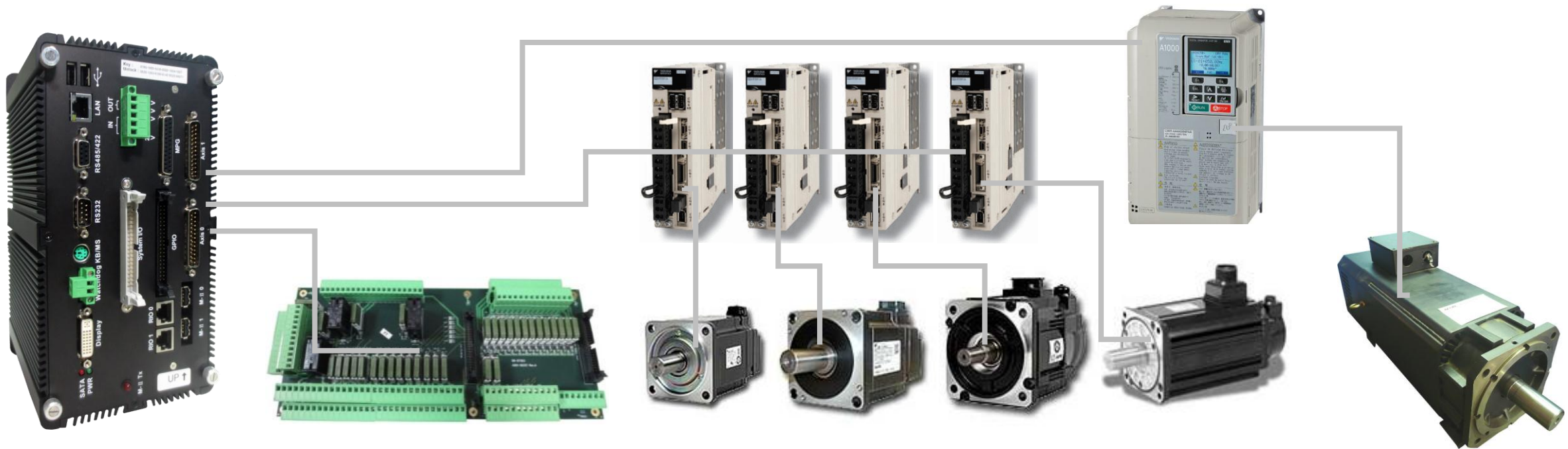


WinDelta

CNC System



CNC Specifications



CNC Hardware Specs

- CPU** • Intel Atom D2550/*Core i7
- Memory** • 2 GB DDR3
- Storage** • 16 GB SSD/*64 GB SSD
- Serial Ports** • RS232, RS422/RS485
- Networking** • T10/T100 Ethernet Port
- Device** • 1x PS/2, 2x USB 2.0
- Inputs** • 10.4"/12.1" TFT LCD
- Display** • 4:3 AR, 800 x 600 Resolution
- 400 cd/m² Luminance
- MDI 1st Panel + 2nd Panel

- Handwheel** • 8-Function Remote Jog Unit (MPG)
- Axis Control** • 5 axis at 0.5 ms servo update rate
- 13 axes at 1 ms servo update rate
- Standard I/O** • 59 DI/33 DO
- 6-channel D/A
- *5 Channel A/D Optional
- Expansion I/O** • 2x Remote I/O ports (64I/64O each)
- Power Input** • 24 VDC

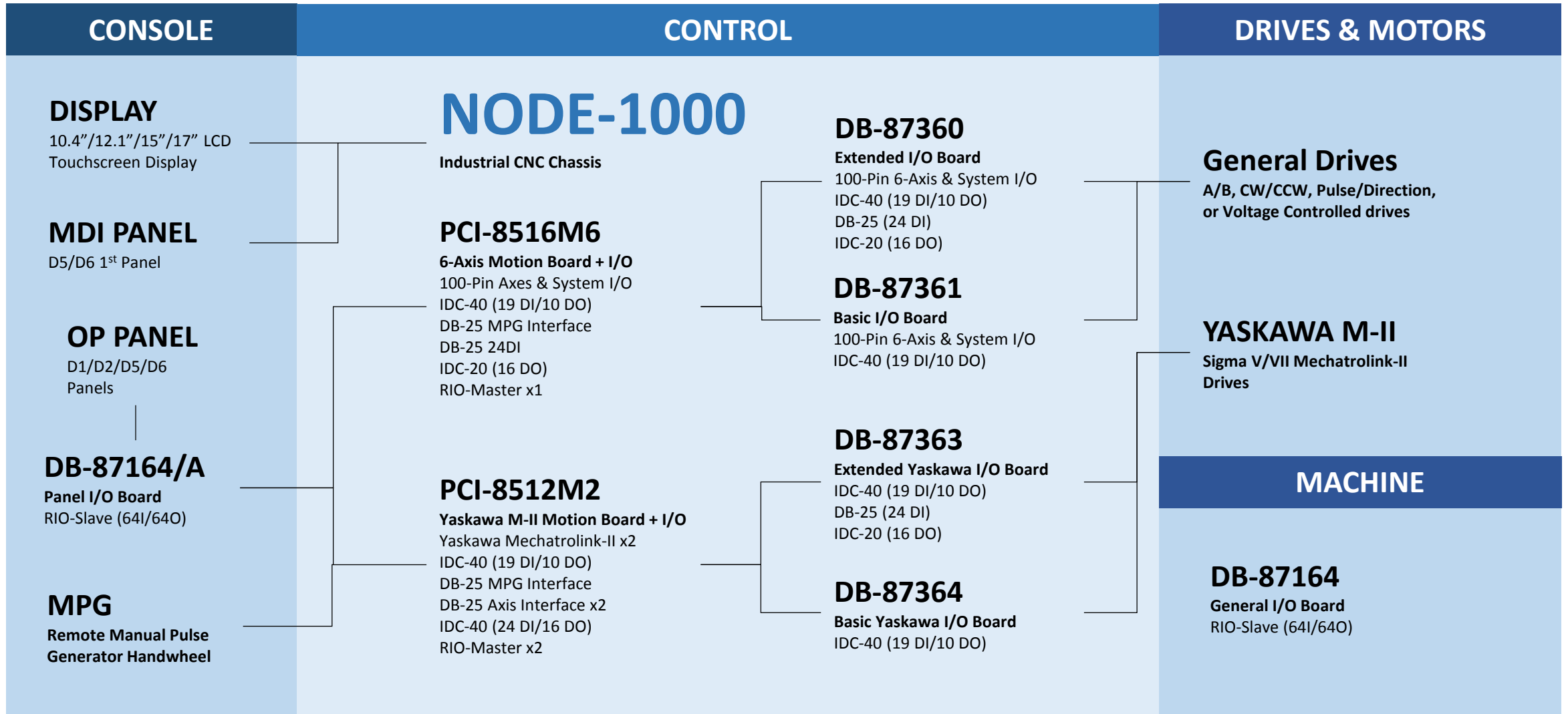
*Indicates Option

CNC Environmental Specs

- Operating Temp** • 0 to 50 °C (0 to 122 °F)
- Storage Temp** • -20 to 60 °C (-4 to 140 °F)
- Operating Humidity** • 5% to 85% RH, non-condensing

- Vibration** • 16.7 Hz: acceleration of 1.5G
- 10 to 57 Hz: amplitude of 0.075 mm
- 57 to 150 Hz: acceleration of 1G
- EMI/EMS** • 1.5 kV CE certified

Board Options



Console Options

DynaPath Mode Screen Series

D1

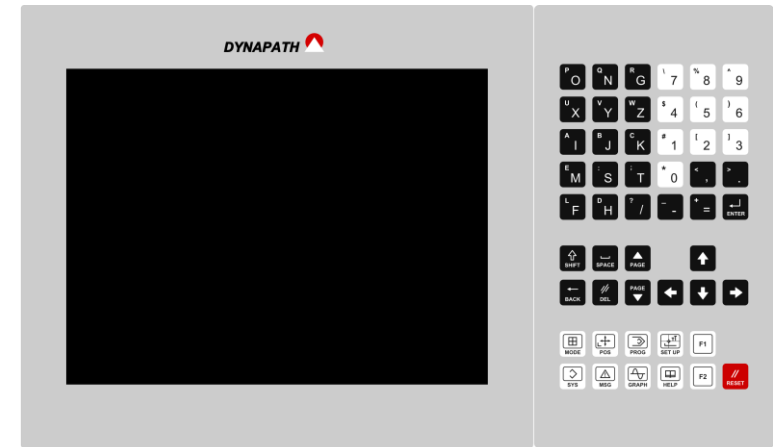


Mode Switch Series

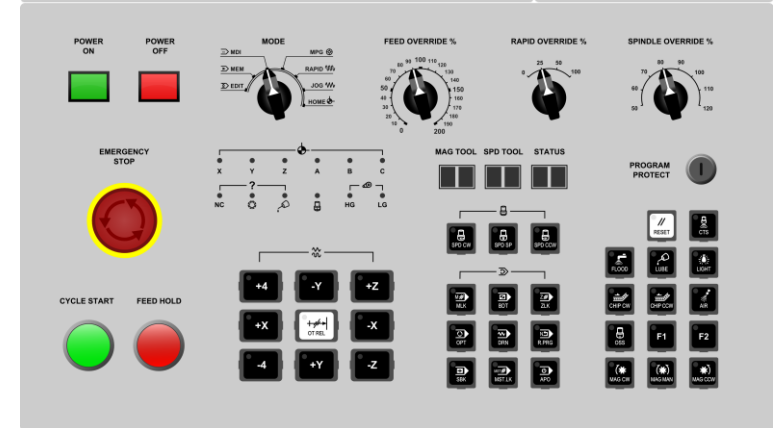
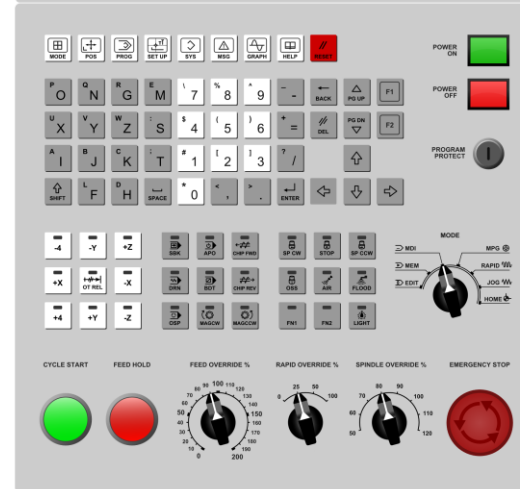
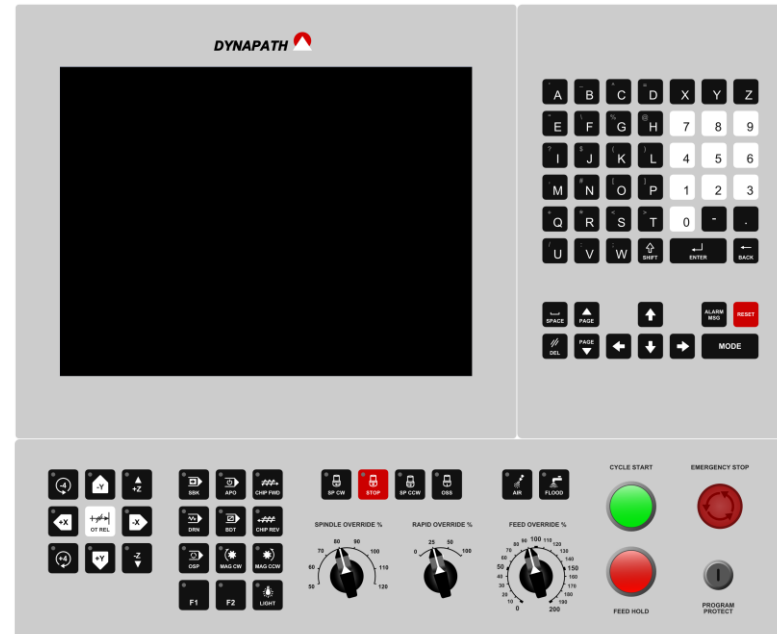
D2



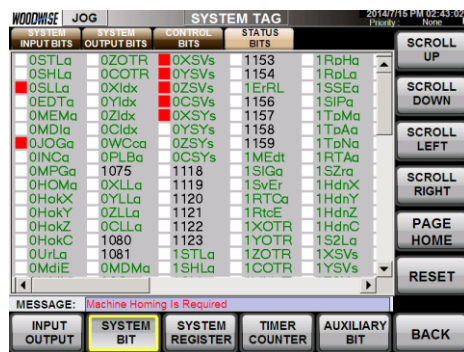
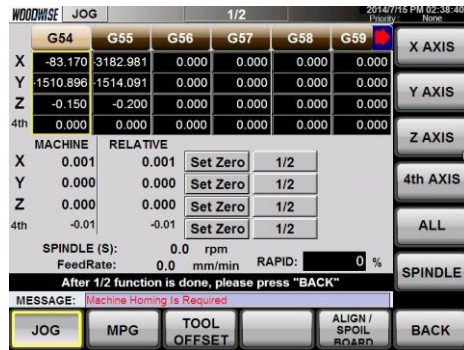
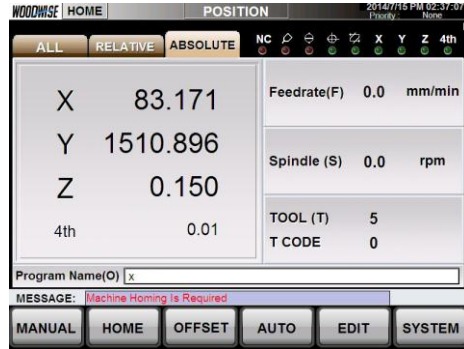
D6



D5

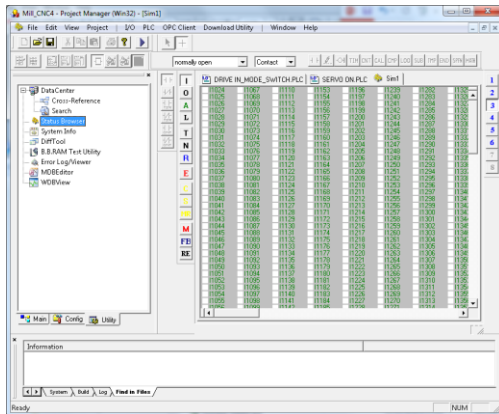
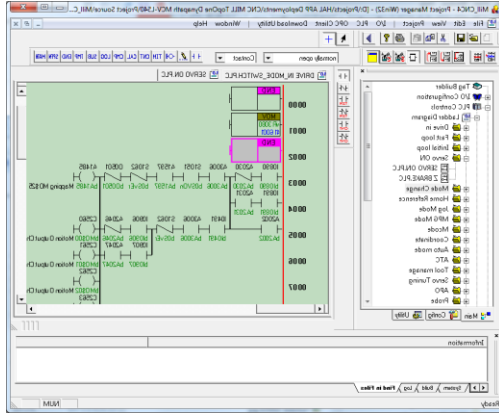


CNC Features and Functions



- Operation**
 - Mode Switch, Mode Select, or touchscreen only
- Manual Mode**
 - Jog, Inc. Jog, MPG, DRO functions
- Home Mode**
 - Individual axis or simultaneous Home location offset
- Tool and Fixture Tables**
 - 54 Fixture offsets plus External
 - Tool length, radius, wear tables
 - Workpiece align functions
- Auto Mode**
 - MDI, Memory functions
 - Feed, Spindle, Rapid overrides
 - MPG Run, Retrace at any line
- Edit Mode**
 - ISO G/M/S/T-Code support
 - Save to, Load from USB
 - Built-in FTP server for remote part program management
- Conversational Programming**
 - Irregular contours, pockets, and islands
 - Background editing
 - DXF Import
- System**
 - Remote diagnostics
 - Alarm history management
 - User access levels
- Motion**
 - 6 CNC synchronous axes
 - 6 PLC axes
 - 4 independent paths
 - 2 independent channels
 - PTP, Linear, circular, helical, NURBS interpolation
 - Abs/Rel position move
 - ECAM, E-gearing registration
 - 1000 block look-ahead
 - Corner accuracy setting
 - Jerk control
 - Trapezoidal and S-curve accel/decel
 - Soft axis limits
 - Backlash, pitch error compensation
 - Tool radius, length compensation
 - Canned cycle and macro support
 - 20 μ s / 5 μ s block processing
 - 500 μ s / 1000 μ s servo update time
 - Fully Digital / Analog voltage command
 - Position loop feedback PI, feed forward
 - Notch filter for resonance control
- Tuning**
 - Online servo tuning for resonance, vibration, torque filter, velocity loop, position loop, and feed-forward

Software Specifications



Kernel & OS

- Windows XP Embedded
- Real-time multi-task kernel (RTX runtime)

Preprocess Speed

- 18 ns PLC function DWORD access cost
- 500 PLC rungs (with add, sub, mul, and div functions) under 0.08 ms

DI Map

- 3072

DO Map

- 3072

Aux Bit Map

- 4096

Register Map

- 4096

Timers

- 1024

Counters

- 1024

PLC

- Ladder, ST, FB, IL
- IEC61131-3 standard
- Multiple modules, each with multiple files
- 1/10/100 ms deterministic execution

External PLC

- GNU C/C++ DLL (call-C)

PLC Editing

- Get/set bits and registers by tag
- Online editing
- Remote monitoring/debugging

HMI Editing

- Equipped with all standard man-machine interface functions for CNC operation, program editing, coordinate display, parameters tables, alarm diagnostics, and security administration

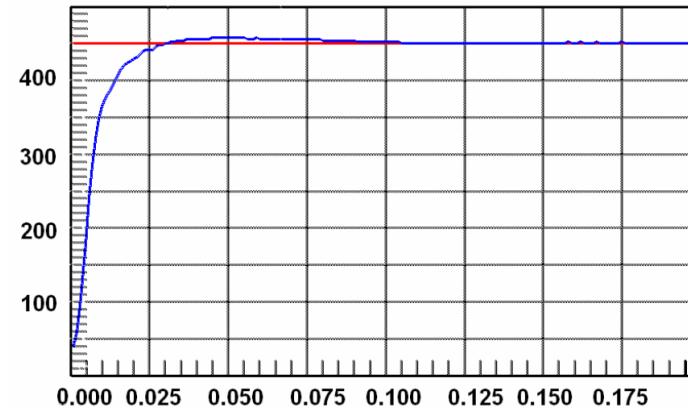
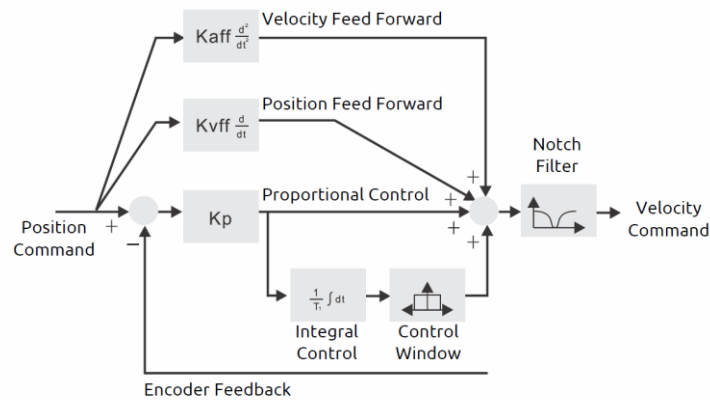
Other Features

- Customizable HMI with GPeX graphical programming tool
- Can communicate with all major brand PLCs
- SQL server with remote access
- Web browsing
- 3D engine for graphics and visualization

Advanced Axis Motion Control and Tuning

Motion Control

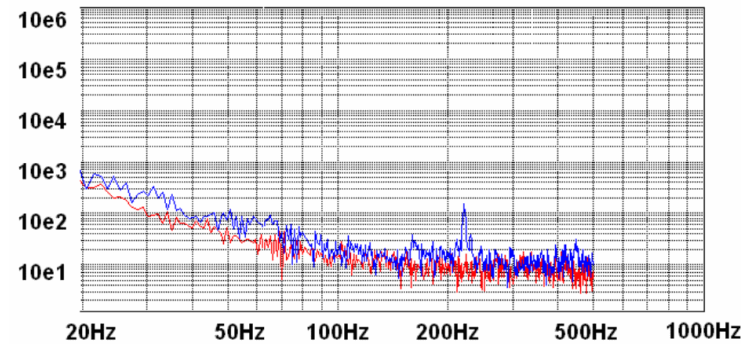
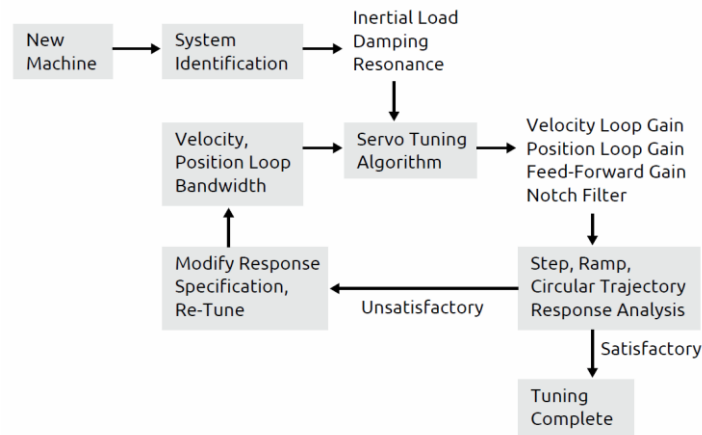
block diagram illustrates how feed-forward loops and a notch filter is incorporated to enable high-speed motion with fine precision.



Tuning Utility

helps system integrators quickly identify system response data to determine proper gains.

Tuning flow chart demonstrates how a system is identified and fine tuned.

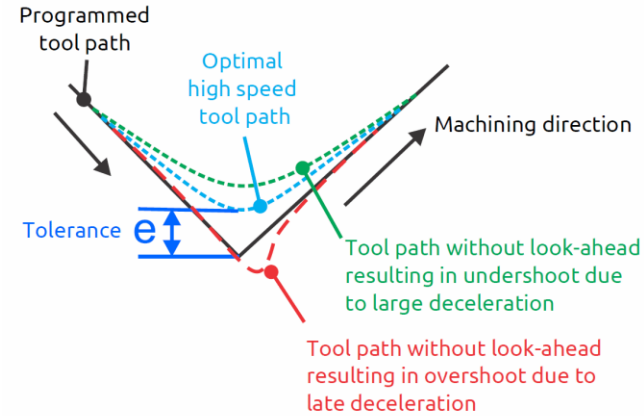
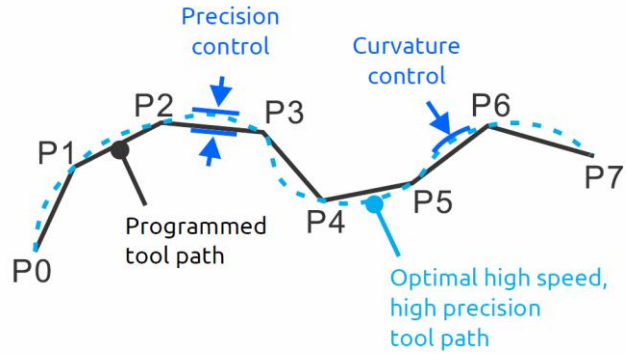


Resonance plots aid system integrators to quickly identify resonance conditions and avoid it by applying a notch filter.

Advanced Path Planning with Look Ahead

Path Smoothing

algorithms provide precision control and curvature control. The result is the optimal tool path for speed and precision.

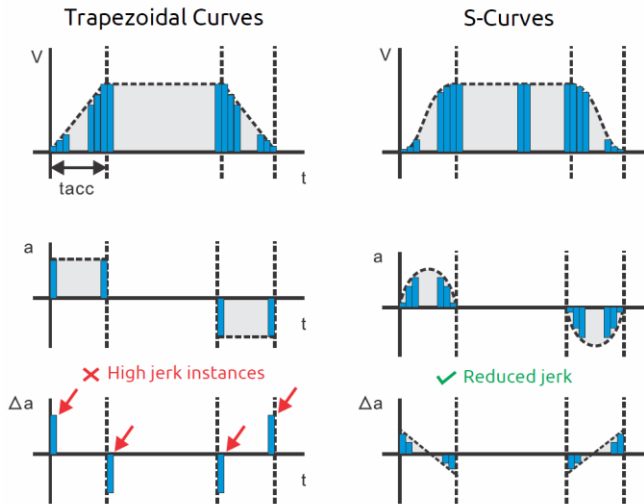
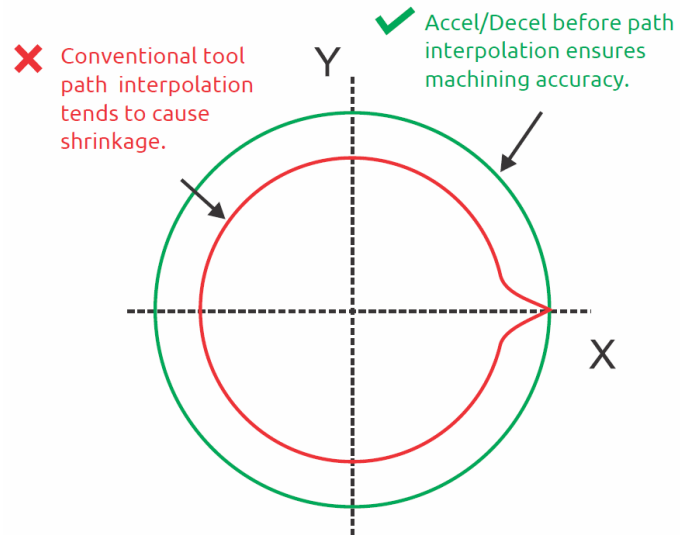


Look Ahead

anticipates upcoming programmed motion, and plans the optimal trajectory in real time up to 1000 blocks.

Smart Interpolation

ensures machining accuracy by performing acceleration and deceleration before path interpolation.



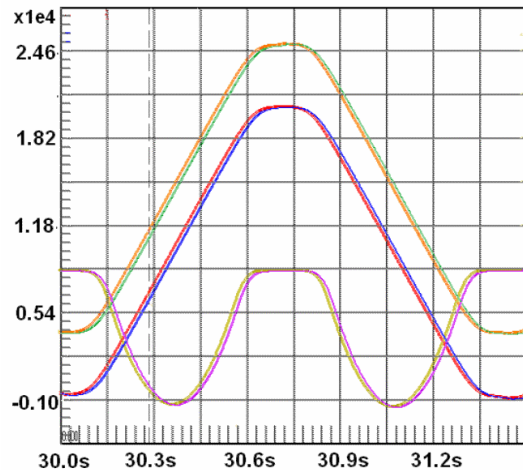
Jerk Reduction is performed by using trapezoidal or S-curve acceleration and deceleration, allowing smoother motion, higher machining speeds, and helps protect against machine wear.

Enhanced Accuracy with Feed Forward

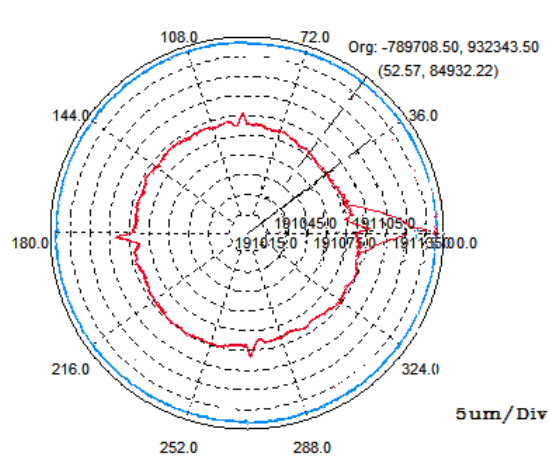
Without Feed Forward and Friction Compensation

XY and Z axes motion accuracy is prone to in correctable position errors, as demonstrated in the following plots on a circular tool path of 28.3mm diameter, at 8 m/min feed rate. In this case the final trajectory has a maximum position error exceeding 20 μm and more than 6 μm reversal spikes are presented.

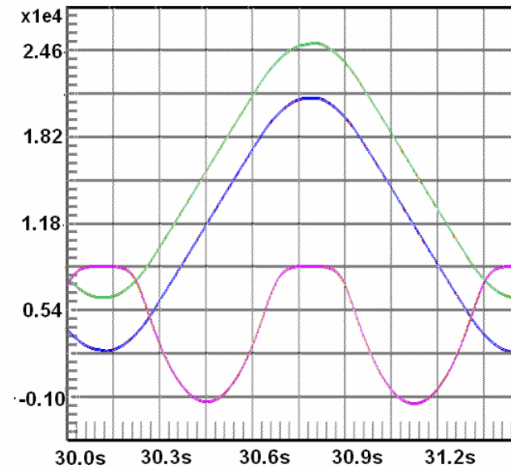
XYZ vs. Time



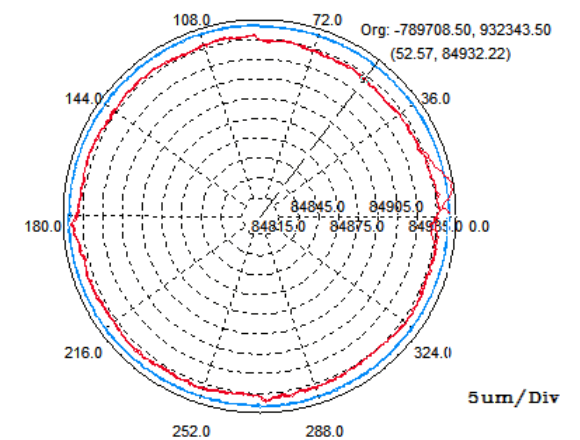
X vs. Y



XYZ vs. Time



X vs. Y



Electric Panel Application

The DynaPath WinDelta CNC system has been adapted for applications ranging from machining centers, turning centers, gear hobbers, tool grinders, optical grinders, and EDMs.

A reference machining center application is illustrated here.

A Minimal System Footprint enables application flexibility and simplifies integration.



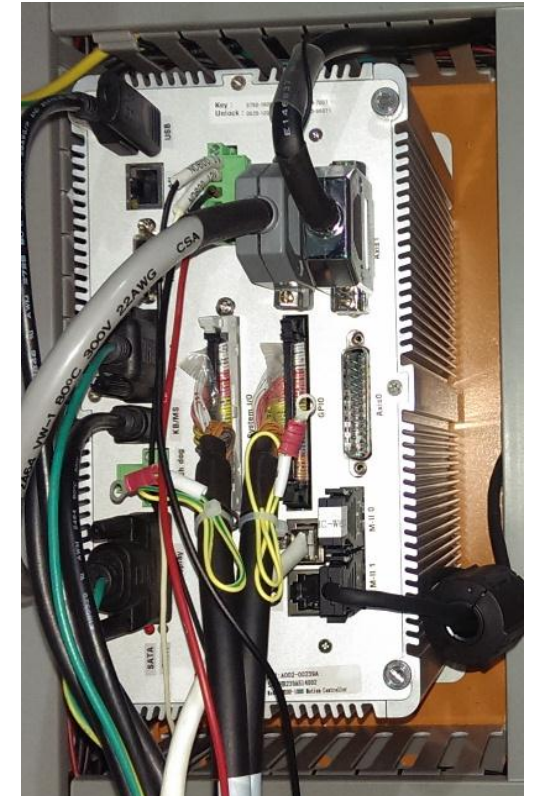
System I/O Daughter Board aggregates I/O to the system to minimize integration work, while quick change connectors allow easy board serviceability.



Yaskawa Σ -V Mechatrolink-II servo drives offer top end, deterministic, digital communications for daisy-chaining of up to 32 drives.



DynaPath WinDelta Controls are designed for heavy duty industrial applications. The fanless, all metal extruded case allows sufficient heat dissipation, while completely sealing itself to protect against dirty environments.



Contact Information

USA

Dynapath Systems, Inc.
34155 Industrial Rd.
Livonia, MI 48150

Tel: 248-488-0440

Fax: 248-488-0430

Web: <http://www.dynapath.com>

Email: sales@dynapath.com

Taiwan

捷准科技股份有限公司
302新竹县竹北市新泰路31号6楼

电话：886-3-554-5710

传真：886-3-554-2241

电子邮件：info@pcbased.com

公司网址：http://www.pcbased.com

Email : info@pcbased.com

China

上海捷准工业自动化设备有限公司
上海市莲花路2080弄50号
邮编: 201103

电话: 86-21-64656336

传真: 86-21-64016987