CNC SYSTEM SOLUTIONS

ANCA motion
Motion Control Solutions

ANCA Motion Specialises In Tailoring Motion Control solutions

At ANCA Motion we design and manufacture flexible control systems, specialising in high precision CNC machines. We tailor our hardware and software to an OEM's exacting requirements, providing solutions that give customers a competitive edge.

Our continuous support and innovation throughout the life of the product allows us to deliver world class products and service.

Innovation

ANCA Motion's innovative CNC systems comprise of both hardware and software solutions that are developed to be robust and flexible for a range of industries.

For the past 40 years we have strived to be leaders in development of machine systems. From the introduction of the handwheel which allowed users to easily step forward and back through a program, to developing and implementing the patented soft axes, our achievements have cemented our status as an industry leader.

Evolution

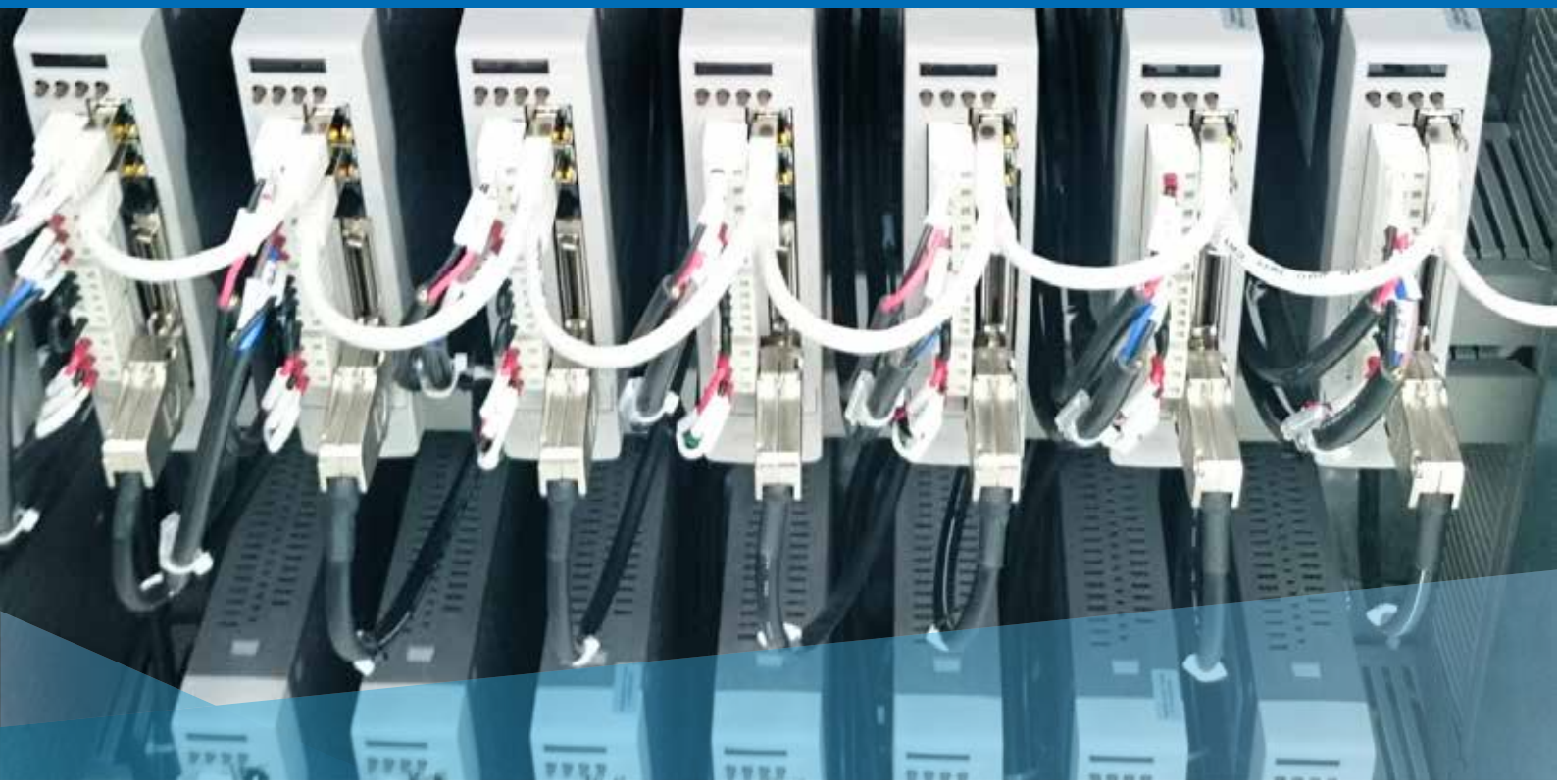
Over many years and thousands of installations ANCA Motion has continued to refine its designs.

Our new touch screen HMI reinforces our state of the art standing, eliminating all but a few critical physical buttons from the front panel and replacing them with a customisable graphic user interface.

The GUI is designed to allow quick and easy access to critical functions. Our CNC's run within a Windows® based environment, allowing you to add your own programs to truly tailor your system.

Not only are we experts in CNC technology but are also proven leaders in machine building and design.

THE COMPLETE PACKAGE



System Information

Maximum axes	20 +
Maximum contouring axes	20
Maximum spline interpolated axes	20
Maximum logical machines	3
Maximum spindles	4
Maximum concurrent PLC's	4
Linear axes	•
Rotary axes	•
Compound axes	•
Soft axes	•
Micro position spindle support	•
Velocity look-ahead blocks	200

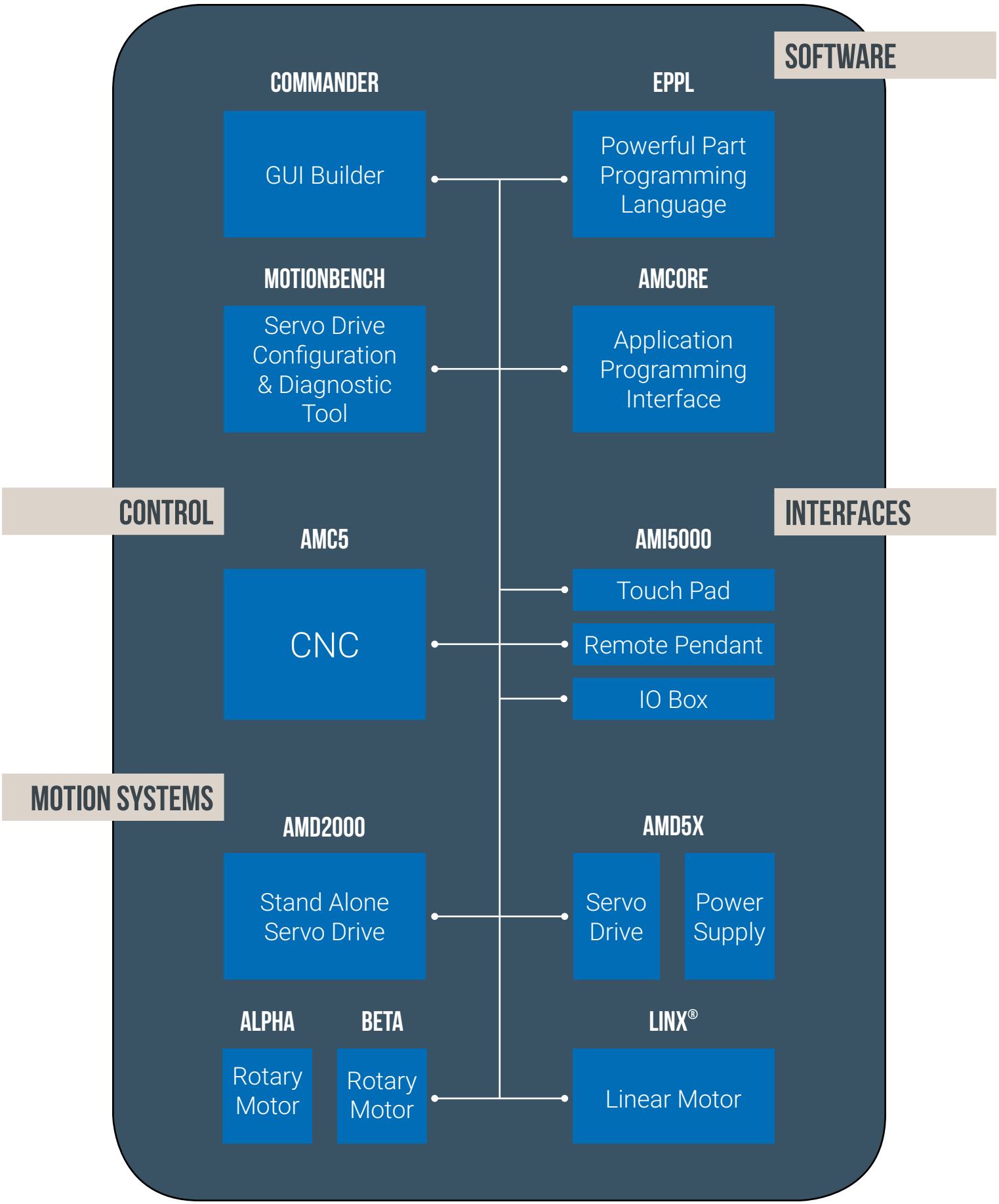
System Characteristics

Operating system	Windows XP Embedded Windows 8
Languages	English, Chinese, Spanish, French, Dutch, Japanese, Korean, Italian, Swedish, Polish, Czech

System Architecture

Software CNC (machine control)	•
Software PLC	•
Open CNC kernel	•
Open PLC	•
Open control of machine	•
Open variable access	•
Kinematics built-in	+
Hierarchical configuration database	•

• STANDARD + OPTIONAL


SOFTWARE
COMMANDER
GUI Builder
EPPL
Powerful Part Programming Language
MOTIONBENCH
Servo Drive Configuration & Diagnostic Tool
AMCORE
Application Programming Interface
CONTROL
INTERFACES
AMC5
CNC
AMI5000
Touch Pad
Remote Pendant
IO Box
MOTION SYSTEMS
AMD2000
Stand Alone Servo Drive
AMD5X
Servo Drive
Power Supply
ALPHA
Rotary Motor
BETA
Rotary Motor
LINX®
Linear Motor

INNOVATIVE SOLUTIONS

Custom Development

We appreciate that every application is different and requires unique and innovative solutions.

As a leading manufacturer of modern digital CNC's we develop all layers of the technology from applications, CNC and PLC to drives and motors, we will work with you to customise these layers to suit your specific motion control applications.

ANCA Motion prides itself on building and maintaining solutions collaboratively. Our best products have been forged through a close working partnership with our clients.

Coupled Motion

Some applications need a large number of axes with very tightly coupled motion, this is where our custom drive interpolation comes in. For example, a 60 axis knitting machine operates with extremely tight synchronisation. Our CNC can act as a motion supervisor, switching in and out particular drive coupled interpolation sequences, depending on the patterns to be handled by the line.

ANCA Motion has a history of success through cooperative design. Our collaborative development has allowed customers to develop their own patentable intellectual property.

Integrated Solutions

General Purpose, Built-In Functions (GBIF) are a particularly easy way to integrate your own software and hardware into our CNC's. GBIF's are functions that are implemented in a general purpose programming language like C, C++ and Java and then accessed from within a part program.

Custom Built

ANCA Motion can develop custom hardware or software for your specific applications. From design of HMI units to I/O and software applications; we can assist you in this process as much or as little as you need.

> "The 40 years' experience that ANCA have in producing drives and CNC's and working with the machine tool division, enables ANCA Motion to provide a product which has lots of knowledge, experience and reliability."
>
> - Grant Anderson
> Group CEO

Experienced Developers

Our engineers work very closely with machine tool designers to tune our CNC's for their specific mechanical configurations.

We collaboratively developed our on-board harmonic resonance filter to automatically determine where to install notch filters to compensate for mechanical resonances.

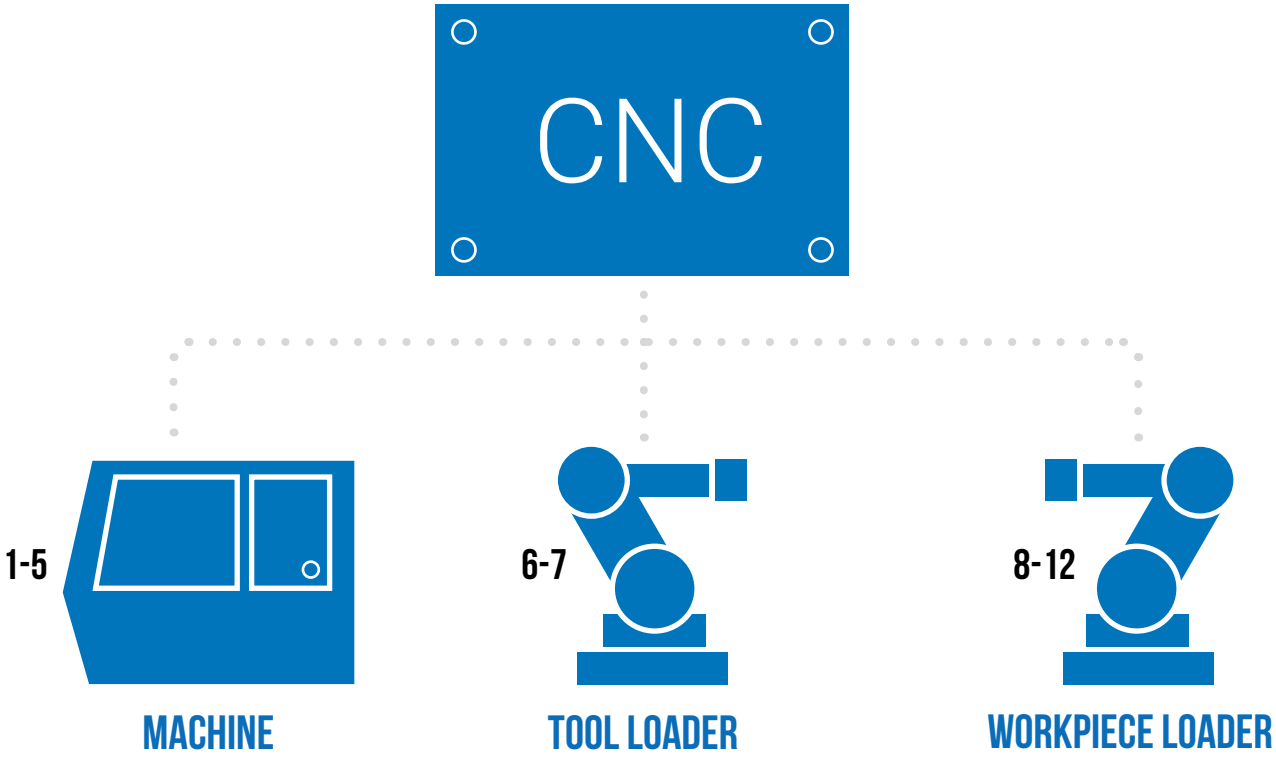
Hierarchical Parameters

The CNC has a sophisticated database for managing hierarchical sets of configuration and commissioning parameters.

This database is open, allowing you to add in your own hierarchical parameters, PLC programs or application programs or edit existing parameters.

Parameters for configuring each servo drive are stored here, allowing drive updates to be done directly from the CNC. No need to unplug a drive and connect it to a separate laptop.

Record individual commissioned machine parameters without affecting the original factory defaults. Restore to either factory or commissioned defaults at any time.



Concurrent Logical Machines

Our system lets you control multiple logical machines concurrently through individual channels. Each machine can be operated autonomously while their specific NC programs are produced from a single CNC unit. Synchronised operations can be easily achieved and maintained because of this arrangement.

Core Kinematics

Complex machines can have complex kinematics. For us, kinematics was never a bolt-on accessory to the CNC. ANCA Motion kinematics are built right into the core data flow of the machine controller, separating axes programming from the joints. Once configured, programming machines with 5 or more axes becomes much simpler.

The kinematics allow machine joints to be mapped to real world machine coordinates which simplify a complex machine into a number of easy to command axes.

Our control systems are used across a range of machines including tool grinders, laser cutters, pinch peel grinders and water jet cutters.

CUSTOMISE FUNCTIONALITY

ANCA Motion develops application specific functions along with industry standard software features.

Spline Interpolation Standard

Complex tool paths are often made up of streams of small moves. These can adversely affect part quality and contouring speed if a CNC is restricted to linear interpolation. ANCA Motion CNC's include 'through-the-points' spline interpolation along all contouring axes as standard.

Standard interpolation modes are available as well as application specific modes like rigid tapping. In addition, we provide several special purpose interpolation modes such as a high speed CAM mode that allows you to bypass the interpolator and drive axes directly from a table of points.

This is advantageous for dedicated machines that perform one complex operation fast and repeatedly.

Tool Path Graphics

All CNC's come bundled with a simple 2D tool path graphics application which can be used to simulate the NC program or to display a graphic representation of the machine in real-time. Tool Path Graphics Stream (TPGS) provides an easy to consume stream of data describing the path of the machine as the NC program is executed.

Programmable Logic Controller

Our CNC's have a software based PLC. This saves cost by eliminating the need for an external PLC to coordinate I/O. It also integrates very tightly into other CNC software modules. IEC61131/61499 compatible software PLC on the CNC for graphical ladder Programming is an optional extra.

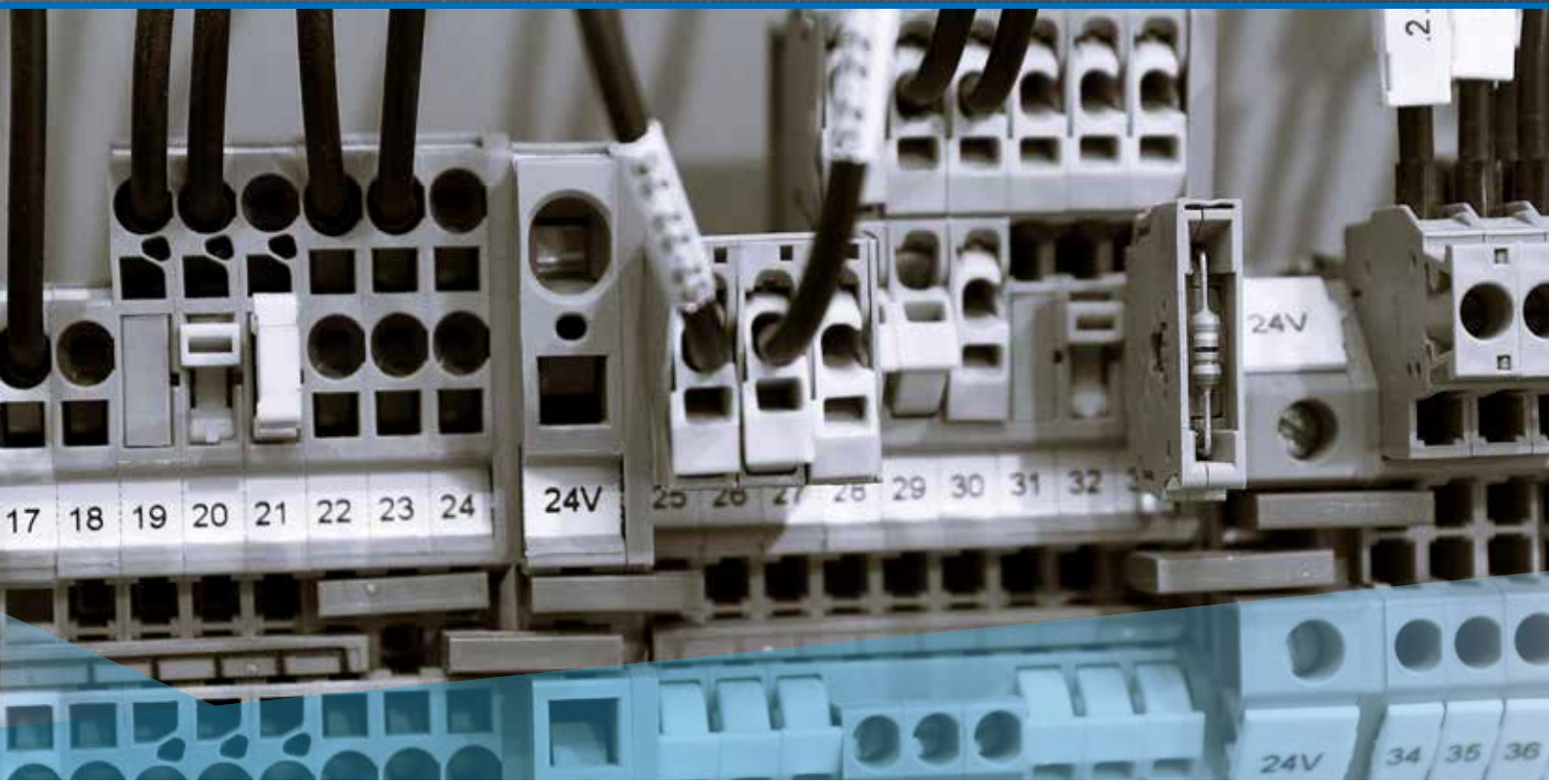
We've developed an easy to understand and write programming language for PLC rungs. The PLC language and compiler comes standard in all Cnc's.

PLC Commands

Physical I/O variables	•
Logical I/O variables	•
General purpose variables	•
Devices	•
Conditional PLC rungs	•
Canned cycles/Macros	•
Logical operators	•
Arithmetic operator	•

• STANDARD

CUSTOMISE FUNCTIONALITY



Frame Transformations

Duplicate and modify parts without writing new programs using frame transformations. Workpiece presets let you zero the machine to the current tool position. A useful feature for manually locating cuts.

Soft Axes

Soft axes allow complex axis combinations to be simply programmed using a virtual or software axis. This makes programs easier to create understand and modify.

Features

Fixture Offset	•
Tool Offset	•
Effector Offset	•
Mirror Image	•
Scale Factor	•
Rotation	•
Axis Swap	•
Live Offset	•

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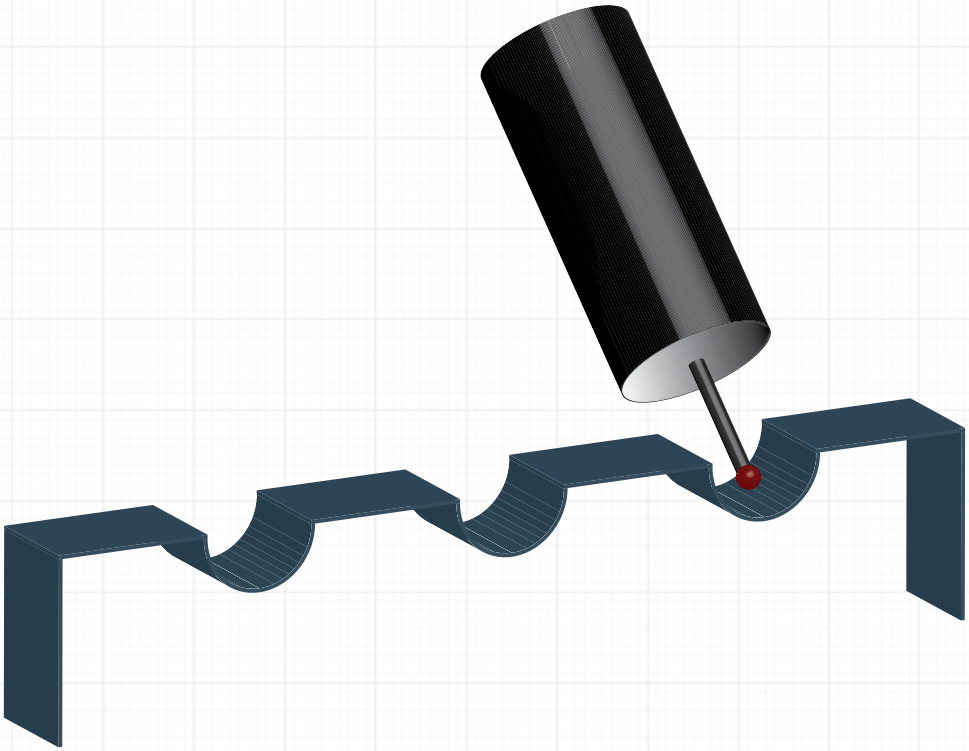


High Speed Probing

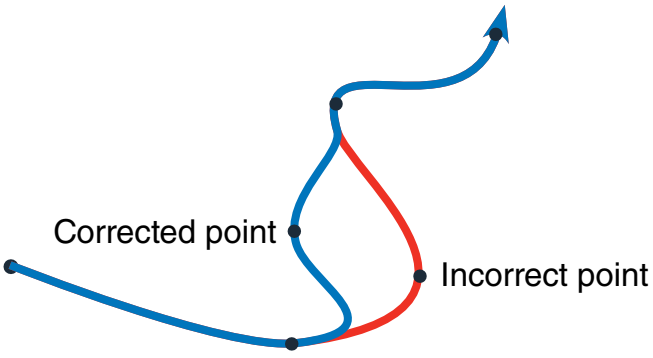
ANCA Motion servo drives have dedicated probe inputs that latch the drives position in a nanosecond when the touch probe connects or the laser probe signal breaks. Therefore the speed of probing can be increased without effecting accuracy.

Communication

Our hardware packages cover all areas of system control, motion output, motor control and machine interface. CNC's, Drives, and I/O devices communicate over an EtherCAT® fieldbus. You can choose from a wide range of third party products to integrate into your system with full interoperability.

Active Retrace

Many multi-axis machines benefit from teach-in programming when developing cutting paths. Our MPG feed, retrace and active program edit features allows you to correct points immediately during a dry-run without the need to restart.



ASSEMBLE YOUR SYSTEM

CNC Unit

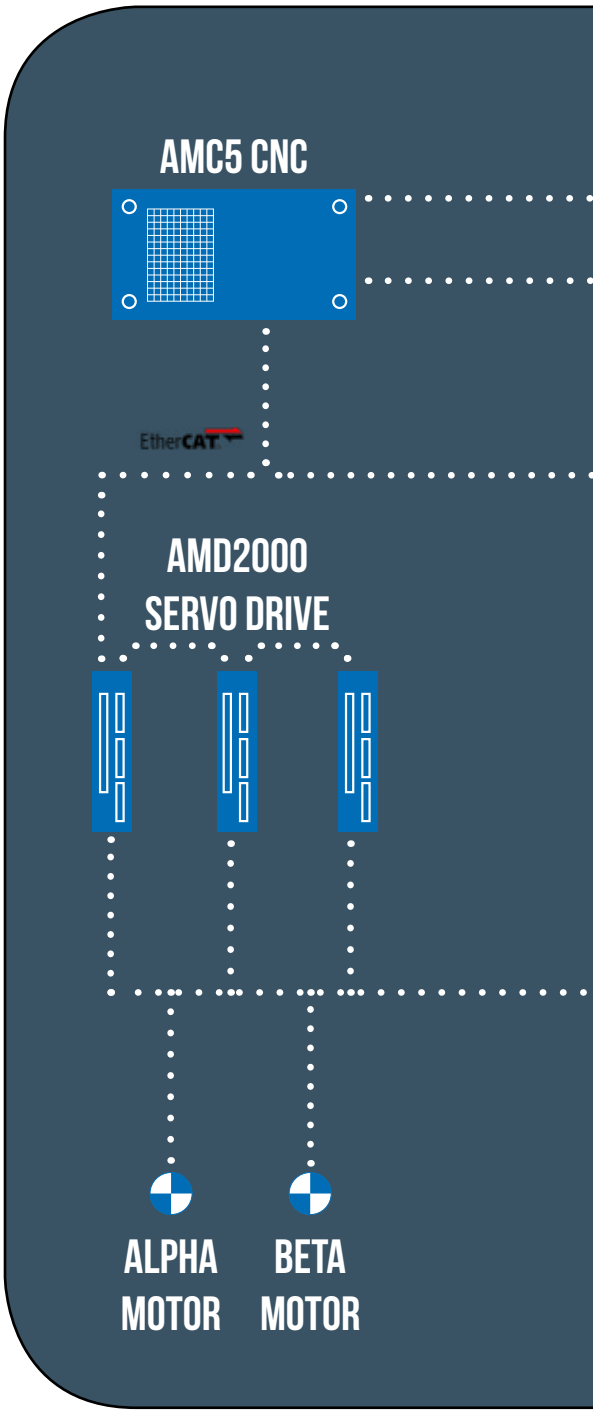
Processor	Core i7
Solid state memory	64GB
RAM (DDR3)	8GB
Operating system	Windows 8 Embedded, Windows XP Embedded
Virus protection software	•
Connectivity	USB, Ethernet
Servo update rate	1ms

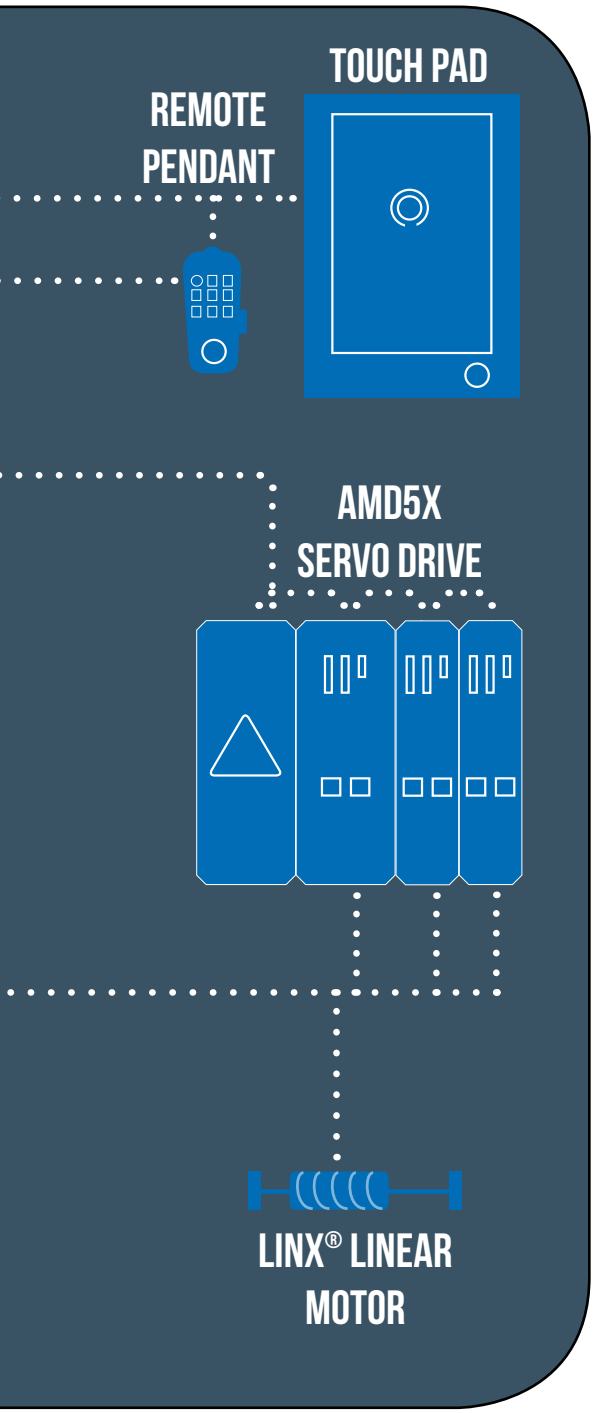
Servo Drive

Current output	3A, 9A, 12A, 20A, 35A, 55A
SoE profile	+
CoE profile	+
Fieldbus	EtherCAT® Modbus
Stand alone	^
Field upgradeable firmware	Std.
Incremental encoder	Analogue, Digital
Applicable motor types	Rotary, Linear

Rotary Motor

Power range	200W-10kW
Protection rating	IP67
Integrated brake	+
Encoder type	Digital/Sin/Cos





Interface Features

Touch screen	•
MPG Feed (Handwheel)	•
Feedrate knob	•
Portable control pendant	+
Active retrace	•
GUI builder	•
Teach-In function	•
Inch/metric display	•
MC status display	•

Infeed unit

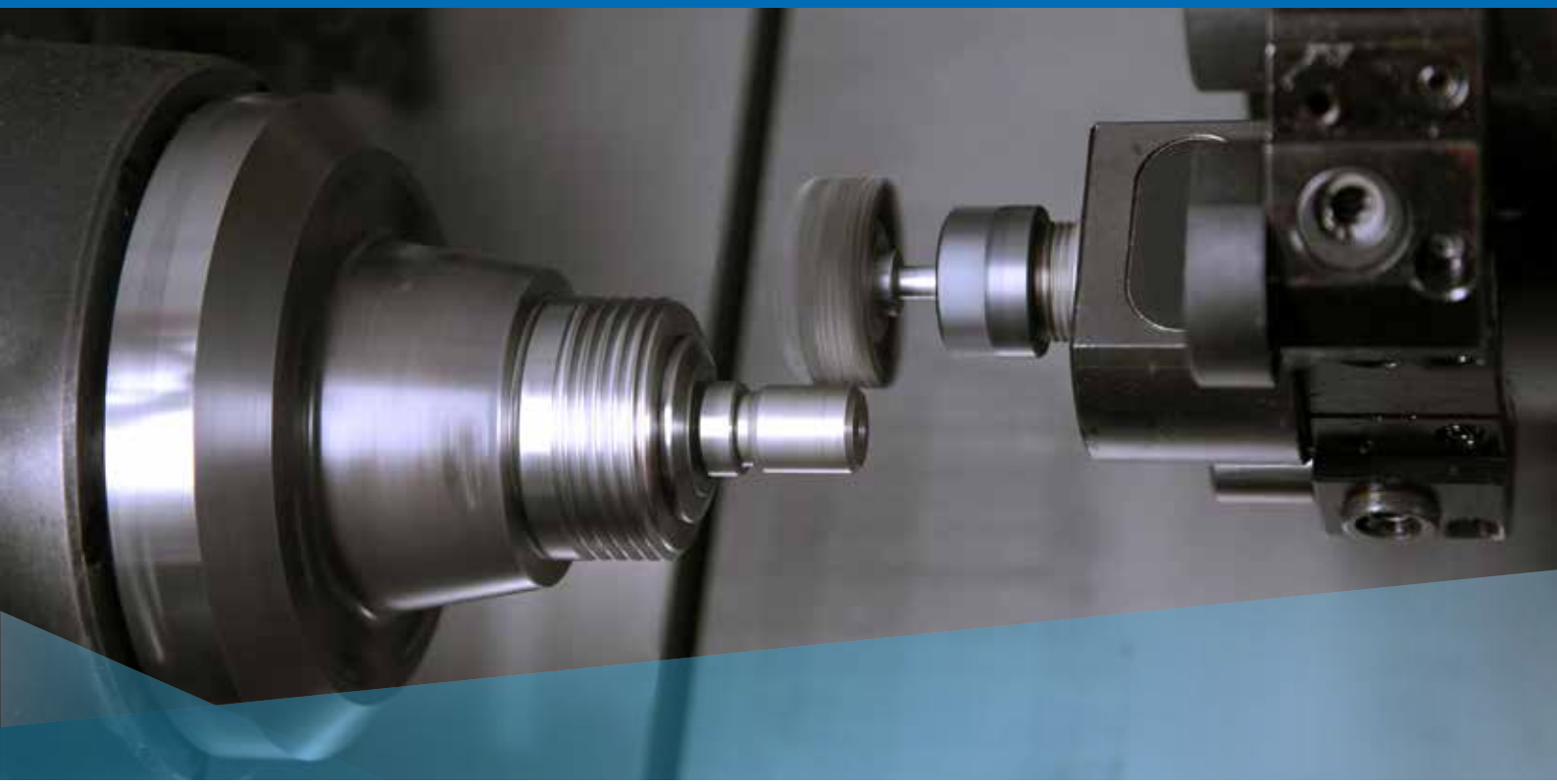
600VDC BUS	•
Mains voltage input	•
Fieldbus	EtherCAT®
Rated DC output power	15kW
Efficiency at rated output	98%

Linear motor

Protection rating	IP69
Net attractive forces	0
Internal temperature sensor	•
External cooling unit	+
Force range	333-665N
Hall affect proximity sensor	+

• STANDARD + OPTIONAL ^ SELECTED MODELS
• STANDARD + OPTIONAL

SIMPLE PROGRAMMING



Extended Part Programming Language (EPPL)

ANCA Motion's NC programming language takes G-Code programming to a whole new level. Access mathematical expressions, variables, subroutines, control flow statements and many more high level programming language features.

EPPL has functions that can be used to develop a windowed user interface for your part programs.

The GUI and machining program for a family of parts can be completely developed in EPPL. This is a handy feature for families of part programs or simple GUI's where interaction with the operator is necessary and there is a desire to keep the code together in one self contained part project.

Our unique programming language is designed to be accessible to users of all skill levels. Write and build code quickly with our intuitive programming language EPPL no matter your existing skill level. Script simply in G-Code or utilise a wide range of mathematical functions to enhance your program's capabilities.

Configuration Database

Get/Put parameter	•
Pattern matched lookup	•
Custom parameter sets	•
Custom data storage	•

Control Flow

Conditional branching	•
Unconditional branching	•
Looping	•
Subroutines /subprograms	•
Sequence/block numbers	•
Block skip	•
Optional stop	•
Pause machining	•
Feedrate overrides	•

Basic Programming

Extended Part Programming Language	•
PLCL	•
IEC61131/61499	+
Maximum NC programming size	>250,000 lines / 1GB
Maximum concurrent NC programs	3

NC Programming

ISO G-Code support	•
Mnemonic alternatives	•
Basic interpolation	•
Advanced interpolation	•
Spline interpolation	•
Electronic gearbox interpolation	•

Variables And Operators

Variables	Local, global PLC, OEM definable
Variable types	Boolean, Integer, Float, String, Array, Multi-dimensional
Combine arguments	•
Logical operators	•
Arithmetic operators	•
Grouping operators	•
Type system	Dynamic - expressions & named variables Static - pre-defined variables
Conversational programming	•
Operating system calls	System
Error login and display	•

Supported Features

Real-time frame offsets	•
Tool functions	•
Tool tables	•
Cutter radius compensation	•
Corner rounding	•
Conditional move termination	•
Dimensional units measurement mode	•
Dimensional units meaning	•
Feedrate mode	•
Spindle speed mode	•
Tool retract plane mode	•
Frame setup and transformation	•
Mathematical notation	•
Mathematical functions	•
Dry run	•
Comments	•

• STANDARD + OPTIONAL

TAILOR YOUR SYSTEM WITH COMMISSIONING TOOLS

Smart GUI Builder - Commander

Designed to allow human operators to seamlessly monitor and interact with processed data, providing a cutting-edge user experience. Commander software utilises the latest technology to seamlessly move and rearrange buttons and icons to suit individual business requirements. Simply drag and drop elements into place to create a unique user experience. Commander is also skinable allowing you to add your own look and feel. Create custom HMI's without the need to develop hardware.

Commander brings technology to you bridging the gap between a developer centric IDE designer and non-programmer domain experts.

Data Logger And Variable Watch - AMCore

AMCore allows you to program CNC motion control software. Core kinematics allow machine joints to be mapped to real world machine coordinates which simplify a complex machine into a number of easy to command axes. Our MPG feed, retrace and active program edit features allow you to correct points immediately during a dry-run without the need to restart. AMCore allows you to integrate and program CNC motion control software. Soft axes allow complex axis combinations to be programed using a virtual or software axis.

The data logger application hooks into the real-time layer of the CNC kernel. It can be configured to capture any variables that the system exposes, from Boolean IO states to servo torques.

Data capture can be triggered manually or automatically on a change in a variable's state. Captured data can be visualised and assessed on screen.

Variable watch gives you a real time view of any variables in the system to improve the ease of debugging complex PLC and system programs.

All of these tools allow you to build your own custom suite of commissioning procedures that can be almost fully automated.

COMPLETE YOUR SYSTEM

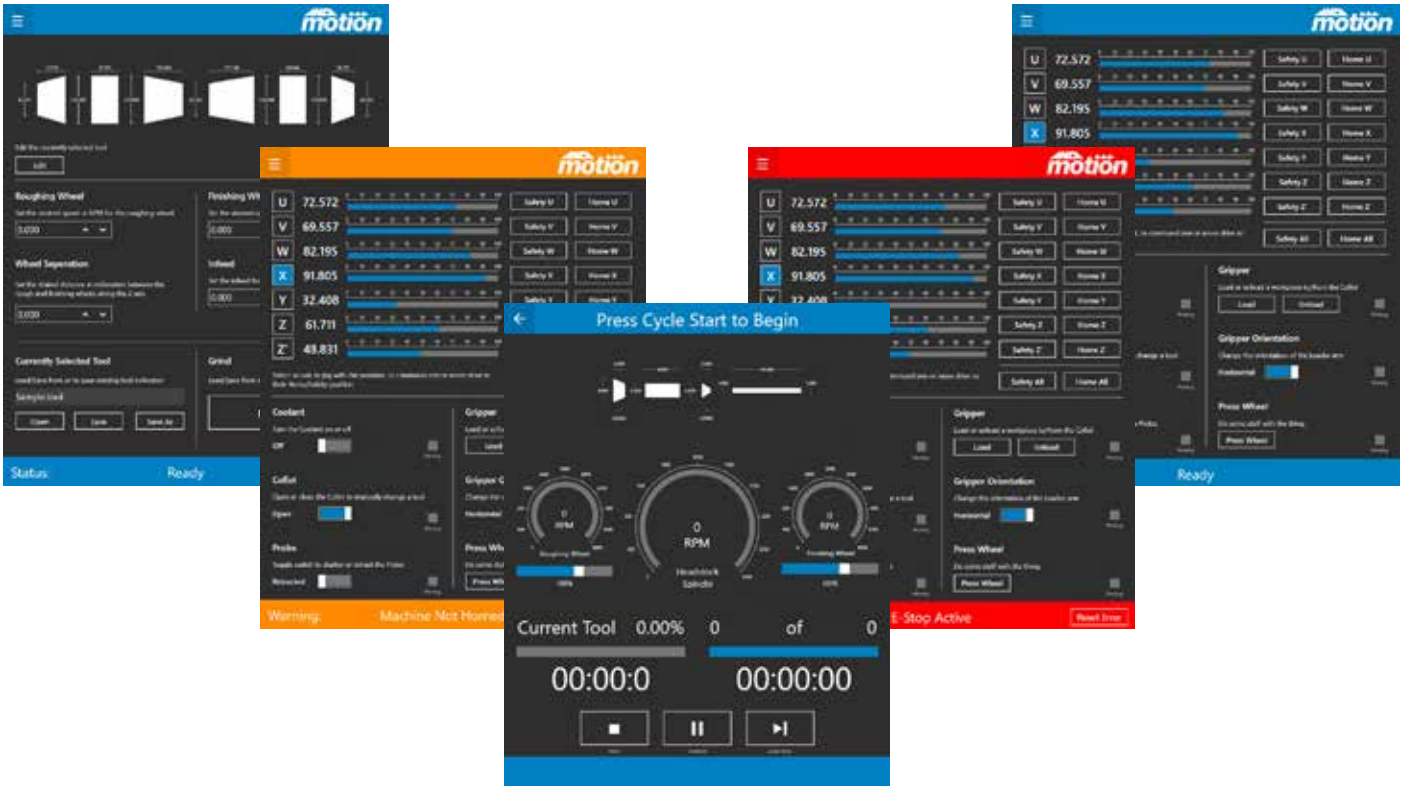
Guided Setup - MotionBench

MotionBench is a software application designed to make the task of commissioning and tuning digital servo drives easy. Update drive code, run tuning algorithms, load parameters, and view the system response in a few simple clicks. Connect and configure multiple drives simultaneously that you can save as customised settings you can recall anytime.

Commissioning Features

Commissioning and startup	MACHINEON, INDEXPC, ZGC, HPP, POSNLATCH, SYNC, WAITPLC
Hard limits	•
Parameter soft limits	•
Home switch	•
Endstop homing	•
Deadstop homing	•
Analogue probe	•
External interrupts	•

• STANDARD



Secure Software

Protect your software with ANCA Motion's built-in software licensing system. Restrict application and feature access to specific machines.

Keep your own software secure, manage feature access and derive revenue from value added features. To unlock features simply send the customer a new authorisation key.

Joint Direction And Backlash

CNC's include per joint parameters to switch the joint direction and compensate for backlash and slip/stick friction.

Pitch Compensation

Minor inconsistencies in joint pitch can be corrected using a calibration procedure that provides multi-point correction along the complete range of each joint, calibrated to an external laser interferometer or glass scale.

CNC Connect - Application Programming Interface

Utilise our application programming interface (API) CNC Connect to control and monitor the CNC state while you develop and add your own software application to ship with your machine tool. Choose from almost any Windows support language such as Visual Basic, C++, C, C# or Java.

CUSTOMER SUPPORT

Global Network of Service Centres

ANCA Motion have an extensive global network of service channels. Our service technicians are OEM factory trained and are one of the most experienced service teams in the world. We deliver the highest standard of customer service which is maintained throughout the entire life of the product.

Replacement Parts

ANCA Motion are able to provide original equipment replacement parts to ensure the highest quality of operation throughout your control systems lifetime.

Software & Hardware Upgrade Programs

ANCA Motion control systems are known to have a long service life and software and hardware is updated frequently. Our service team can assist you with updates to take advantage of more recent technology.

Technical Queries & Application Support

Our factory trained service team are able to provide technical support and advice to keep your control solution running and in peak performance.

Training

Application training can be made available when a control solution is installed or at a later date. Training is provided on site and in a wide range of topics to encompass every aspect of your company's needs.

Service Contracts/ Maintenance Agreements

To keep your control solution running at the highest level of performance and to minimise any production downtime, an ANCA Motion service contract/maintenance agreement can help you identify potential problems before they occur. This means you have one less thing to worry about. Please contact your local ANCA Motion branch for a customised quote.

The ANCA Group of companies consists of ANCA CNC Machines, ANCA Motion and Tinfish. The ANCA Group specialises in design and manufacture of Machine Tools, Motion Control Systems and metal fabrication. The members of the ANCA Group have achieved market leadership through innovation and a commitment to research and development. The ANCA Group Head Office is in Melbourne, Australia, its member companies have a network of overseas branches and approximately 900+ staff worldwide.

THE ANCA GROUP

ANCA CNC MACHINES

ANCA motion Motion Control Solutions

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