AUTOMATIONDIRECT

From simple to sophisticated, we've got an affordable motion control solution for you.

Productivity Motion
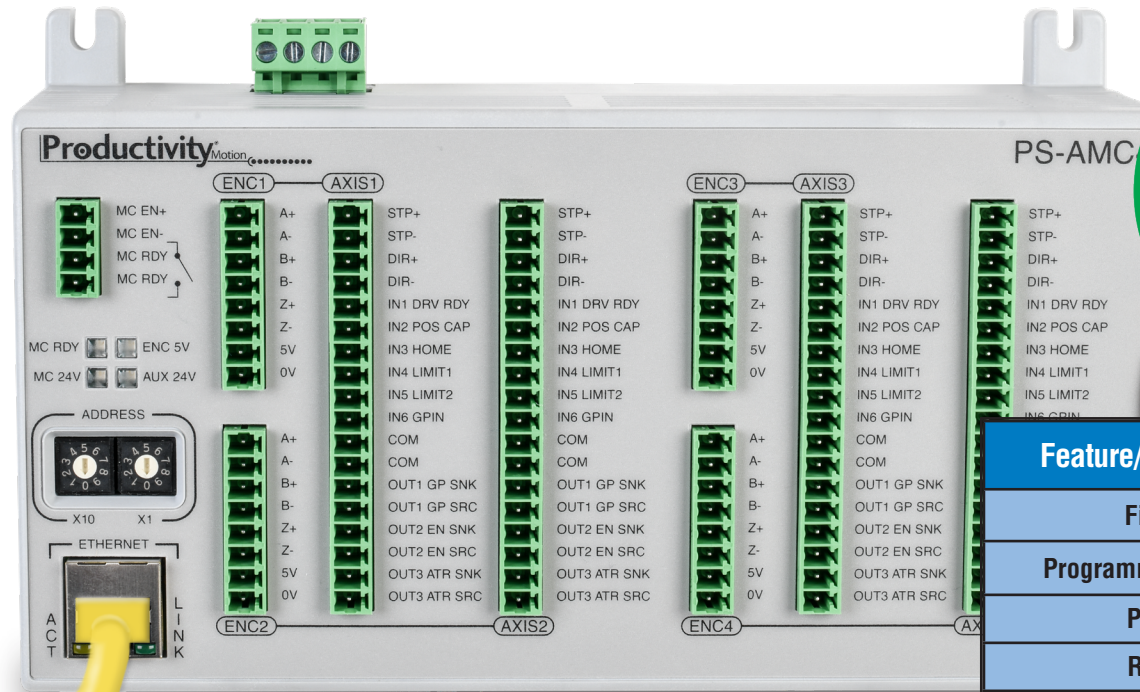
PS-AMC4

PS-AMC Enhanced Motion Controller

Starting at only $331.00

The PS-AMC motion controller is an ideal choice for low-cost coordinated motion that's easy to use and reliable. Designed to work effortlessly with the Productivity family of CPUs, the AMC provides accurate, synchronized, motion control on up to four axes per module for a very attractive price.

Use the PS-AMC with select Productivity series CPUs for low cost, coordinated motion control in any application

- Flying cut-off systems
- Press feeds
- In-line bottle filling
- Auger fillers
- Label applicators
- Smart conveyor systems (random timing infeeds)
- Rotary tables
- Vertical-form-fill-seal
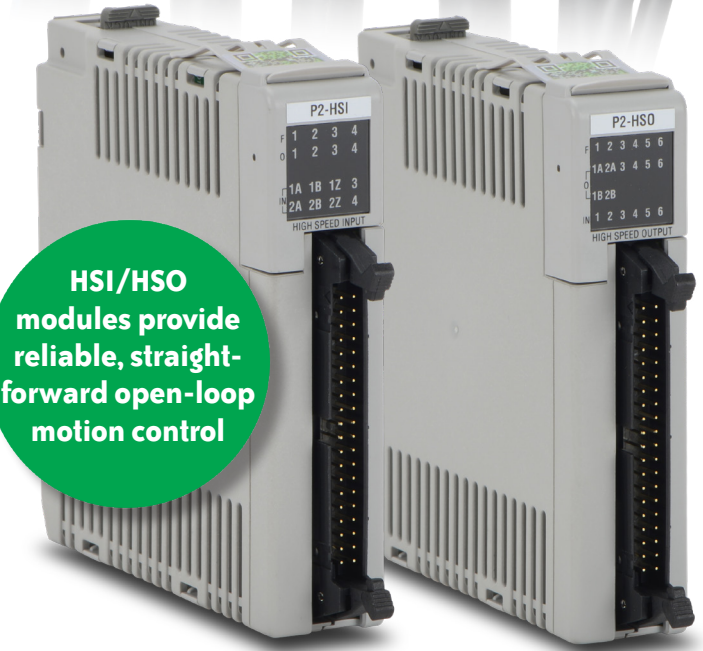- Case erectors/ packers

- Cut to length systems
- High-speed mail sorting
- Web/film handling
- Boring/drilling/tapping
- Coil winding
- Wrapping
- Thermo-formers
- Rotary knives
- And many more...

Feature/Instruction/Application	PS-AMC	P2-HSI	P2-HSO
Find Home (HOME)	✓	---	✓
Programmable Limit Switch (PLS)	---	✓	---
Preset Table (PST)	---	✓	---
Registration (REG)	---	✓	---
Manual Registration (MREG)	✓	---	---
Auto Registration Correction (AREG)*	✓	---	---
Simple Move (SMOV)	✓	---	✓
Multi-Axis Motion Sequencer (MMSEQ)**	✓	---	---
Set Position (SPOS)	✓	✓	✓
Velocity Move (VMOV)	✓	---	✓
Write HS Outputs (WHSO)	---	✓	✓
Write AMC Outputs (WAMO)	✓	---	---
Electronic Gearing (GEAR)*	✓	---	---
Rotary Table Application (RTA)*	✓	---	---
AMC Axis Enable (AEN)	✓	---	---
Flying Cutoff (FCO)*	✓	---	---
Motion Sequencer (MSEQ)*	✓	---	---
Coordinated Motion	✓	---	---
Max # Axes per Motion Controller or Motion Module***	4 (PS-AMC4)	2	2

Application-specific instructions
** *The MMSEQ instruction can perform coordinated XYZ moves with a defined motion profile for the vector path (linear interpolation), automatically calculating involved axis parameters*
*** *Up to four PS-AMC controllers can be connected to a Productivity2000 CPU for up to 16 axes total*

P2-HSI / P2-HSO Modules
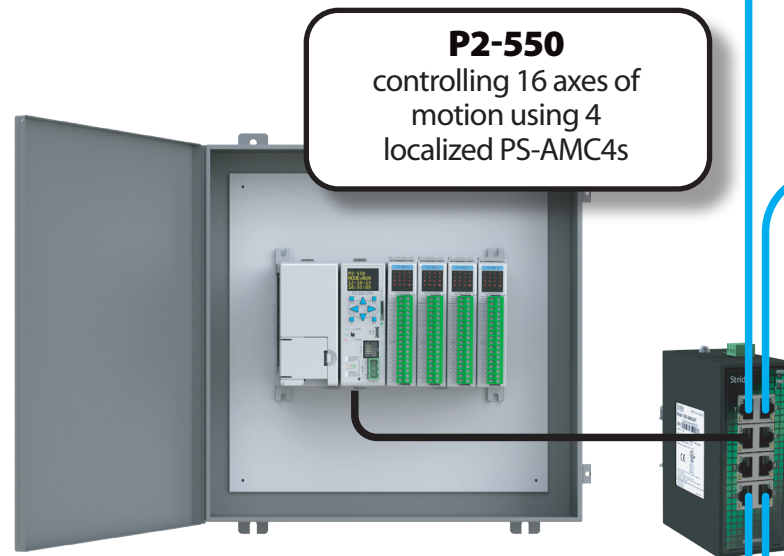
Priced at $278.00 ea.

If you need to perform simple motion commands like homing routines, set position, preset tables, etc. on up to 2 axes per module, then the P2-HSI and P2-HSO modules may be all you need. These modules slide right into any open slot in any local or remote rack, easily adding low-cost basic motion control to your Productivity2000 system.

Multi-axis motion control that's accurate and affordable

The PS-AMC motion controller is an ideal solution for motion control applications requiring several independent axes of motion and/or coordinated motion between some or all axes. Available in one to four axes models, the PS-AMC provides highly accurate positioning using encoder fed control (one encoder per axis). Used in conjunction with select Productivity CPUs and programmed with the FREE Productivity Suite software, the AMC can supply up to 1MHz of pulse-train command signals to servo or stepper drives for extremely responsive movements any application.

Drawings are for illustrative purposes only.

Flying cut-off application

The primary function of a flying cut-off system is to synchronize the speed of a servo-driven carriage, on which a cutting mechanism is mounted, with the speed of a continuously fed material to make a perpendicular cut without stopping the feed. These applications are used where it isn't practical to stop and start a continuous production operation.

The flying cut-off shown above employs four axes of motion, a rotating pipe cutter[1], a continuous pipe infeed system[2], carriage positioning drive[3], and outbound conveyor[4]. With the PS-AMC4, all four of these axes can be easily controlled and synchronized within the same controller, and it's only $542.00!

PS-AMC1
$331.00
1 AXIS

PS-AMC2
$401.00
2 AXES

PS-AMC3
$472.00
3 AXES

PS-AMC4
$542.00
4 AXES

Huge Timesaver
-10
BUILT-IN MOTION SPECIFIC INSTRUCTIONS

Flying Cutoff (FCO)

Module Name:	AMC-1
	In Progress: InProgress
	Complete: Complete
Direction of Master: Positive	Instruction Status: Status
Synchronized Tool Output: None	Cycle Count: CycleCount

DriveTrain | Tracking Start | Tracking Finish

☐ Use Encoder as Primary Master Axis

Master Axis: AMC-1-AXIS-2
Tool Axis: AMC-1-AXIS-3
Synchronize Ratio: Ratio
Slew Rate: SlewRate (pulses/sec²)
Tool Start Position: ToolStartPos (pulses)
Tool Return Velocity: ReturnVel (pulses/sec)

AWESOME DEAL!
only
$116.25
per axis

Productivity®Motion ●●●●●●●●●●

Easily control up to 16 axes of motion across your facility

Each remote I/O capable Productivity2000/3000 CPU can control up to 16 axes using four PS-AMC4 controllers each coordinating up to four axes on their own (P1000 systems can control up to 4 axes using 1 PS-AMC controller). So whether you have a single system with 4 or more axes of motion, multiple coordinated systems across your facility, or if you're anticipating future expansion, the PS-AMC is a perfect solution for your motion application.

The Productivity Suite software provides the following for the PS-AMC:

- Motion profile set-up with easy-to-use built-in motion instructions
- Software test tool allows you to test the hardware without any ladder code – very useful for validating the physical wiring
- Real-time status and diagnostic information
- Plug-and-play hardware configuration using auto-discovery of the AMC units

PS-AMC4
each coordinating motion between 4 SureServo2 drives

P2-550
controlling 16 axes of motion using 4 localized PS-AMC4s

Huge Timesaver

-10

BUILT-IN MOTION SPECIFIC INSTRUCTIONS

Smart conveyor application

When it comes to package handling, pick-and-place or similar applications, product spacing is very important. One way to ensure proper spacing is to send the products through a smart conveyor system. With a smart conveyor, products arriving from an upstream process are brought to the right distance and phase position using several belts that are electronically coupled with each other through a PS-AMC controller. Each conveyor's servo motor will speed up or slow down to achieve the appropriate spacing between products. Four coordinated four-belt smart conveyor systems can be controlled with just one CPU.

Automatic Registration (AREG)

☐ Use Structure

Module Name: AMC-1

Drivetrain
☑ Use Encoder as Primary Master Axis

Master Axis AMC-1-AXIS-1

Correction Axis AMC-1-AXIS-2   Ratio CorrectionRatio ...

☑ Use Accumulation Axis

Accumulation Axis AMC-1-AXIS-3   Ratio AccumRatio ...

In Progress InProgress
Complete Complete
Instruction Status Status
Last Correction LastCorrection

Target Capture Input None on Axis 'AMC-1-AXIS-1'

Drawings are for illustrative purposes only.

Productivity from A to X-Y-Z

When it comes to X-Y-Z positioning, commonly achieved with gantry systems, the PS-AMC motion controller makes it easy. With the PS-AMC, Productivity CPU, and the Multi-Axis Motion Sequencer (MMSEQ) instruction, you can:

- Perform smooth movements between two or more points in up to 3 axes, plus an optional tool axis.
- Easily code For/Next or Do/While loops to repeat portions of the sequence, as desired.
- Iterate through up to 64 steps in a motion sequence, including adding timers and pauses between move actions.

X AXIS
Y AXIS
Z AXIS

Huge Timesaver
-10
BUILT-IN MOTION SPECIFIC INSTRUCTIONS

One MMSEQ instruction does the work of several lines of code

Milling/routing application

When milling or routing materials to match specifications, accuracy is key. Just the slightest misstep during a cut can cause a complete redo and wasted material. Most milling machines utilize three axes of motion (X, Y, and Z axes) and require accuracy that is repeatable time and time again, making these types of applications perfect for ProductivityMotion components.

Productivity Motion

Precise linear interpolation

A common task in motion control applications is straight line motion. This can be accomplished using multiple axis of motion that work together to perform a linear move from one point to the next. This is also known as linear interpolation. The PS-AMC combined with a Productivity CPU allows you to precisely control each axis so that they all move in unison to reach the target position at the same time; resulting in a straight line from start to finish.

Axis3
Axis2
Axis1

Multi-Axis Motion Sequencer (MMSEQ)

Module Name: AMC-1
Sequence Input: SEQ_IN

Vector Parameters (LIN Moves)
Velocity: AMC-1.LINVelocity
Ramps: AMC-1.LINRamps
Jerk: AMC-1.LINJerk

Move Status: AMC-1.Status
Current Segment: AMC-1.Segment
Loop Count: AMC-1.LoopCount
Sequence Output: SEQ_OUT

Axis Definitions | Sequence Table

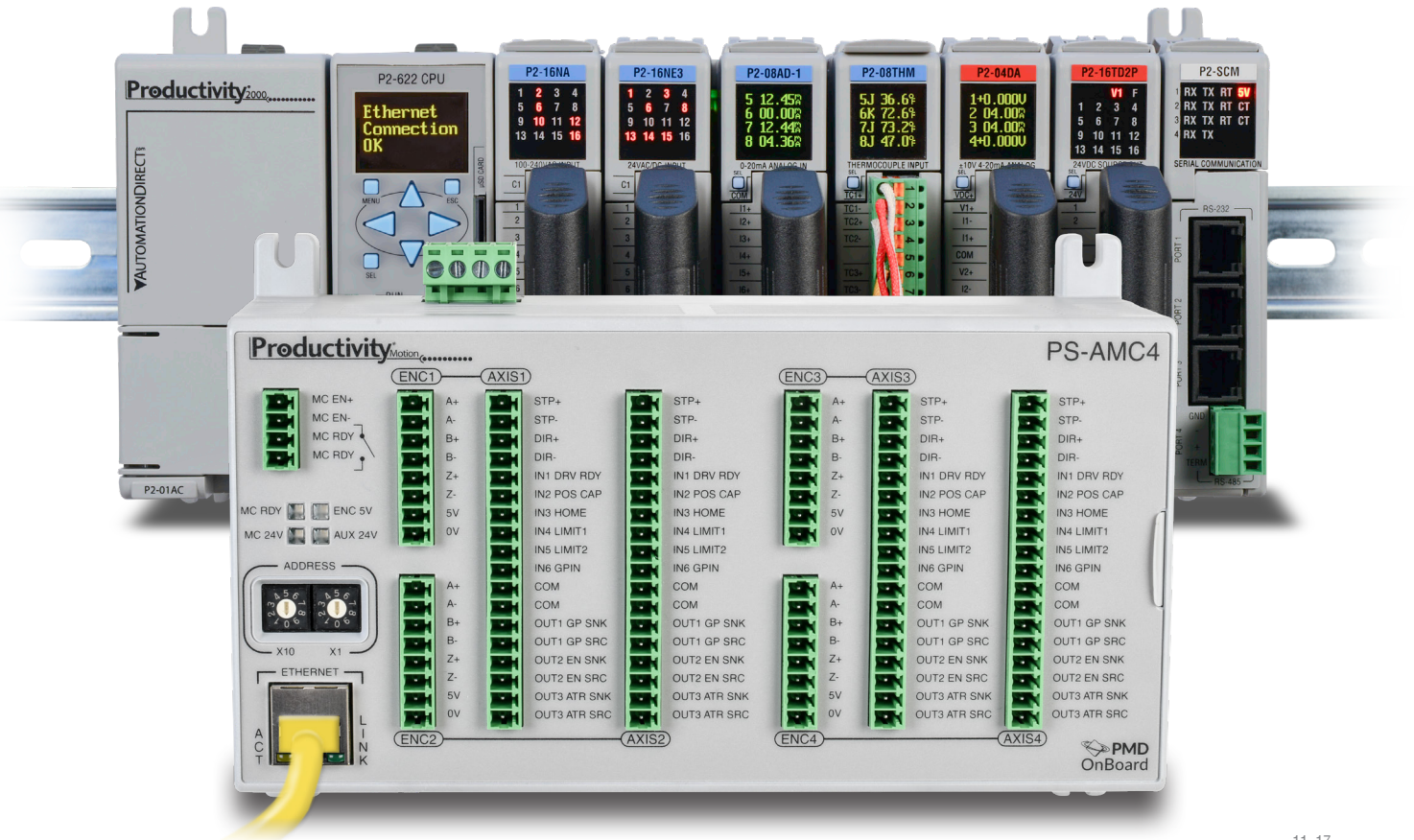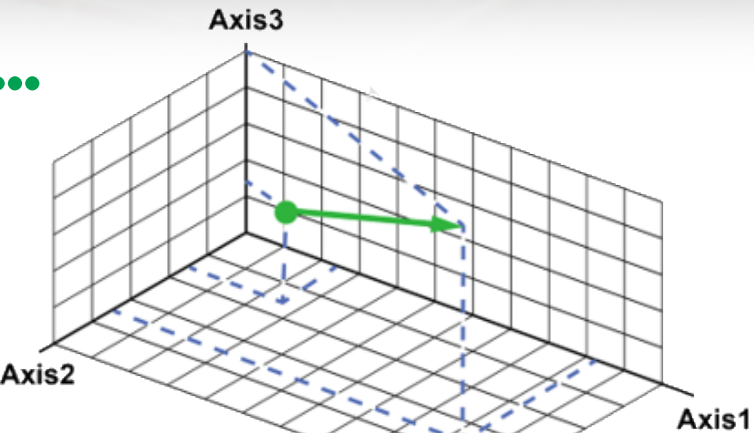Multi-axis Selection: X, Y, and Z Axes   Note: Units listed are Position Units, Time Units

	AxisName	Position	Velocity	Ramps	Jerk	Units
X-Axis	AMC-1-AXIS-1	AMC-1.XPosition	AMC-1.XVelocity	AMC-1.XRamps	AMC-1.XJerk	pulses,sec
Y-Axis	AMC-1-AXIS-2	AMC-1.YPosition	AMC-1.YVelocity	AMC-1.YRamps	AMC-1.YJerk	pulses,sec
Z-Axis	AMC-1-AXIS-3	AMC-1.ZPosition	AMC-1.ZVelocity	AMC-1.ZRamps	AMC-1.ZJerk	pulses,sec
Tool Axis	AMC-1-AXIS-4	AMC-1.ToolPosition	AMC-1.ToolVelocity	AMC-1.ToolRamps	AMC-1.ToolJerk	pulses,sec

PS-AMC4

Precise positioning for when close enough just won't cut it

With machinery that uses coordinated motion where one move is dependant on another, especially in situations where a secondary move can only happen once the first has cleared its path, positioning inaccuracies can cause major production loss or even substantial equipment damage. Even small fluctuations can compound and become big issues if not corrected in time. The Productivity AMC has features built-in to compensate for measurement drift and allows on-the-fly position corrections to maintain superior accuracy.
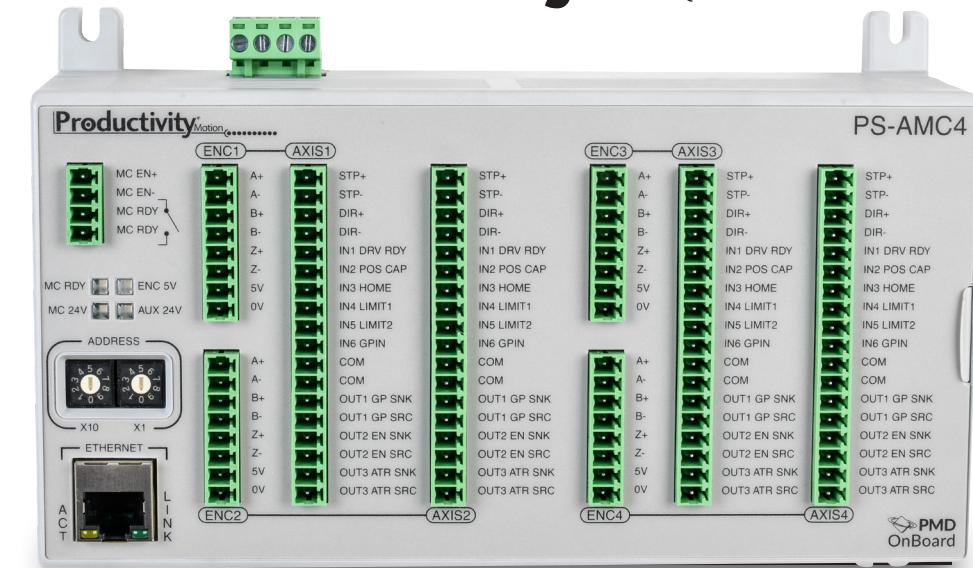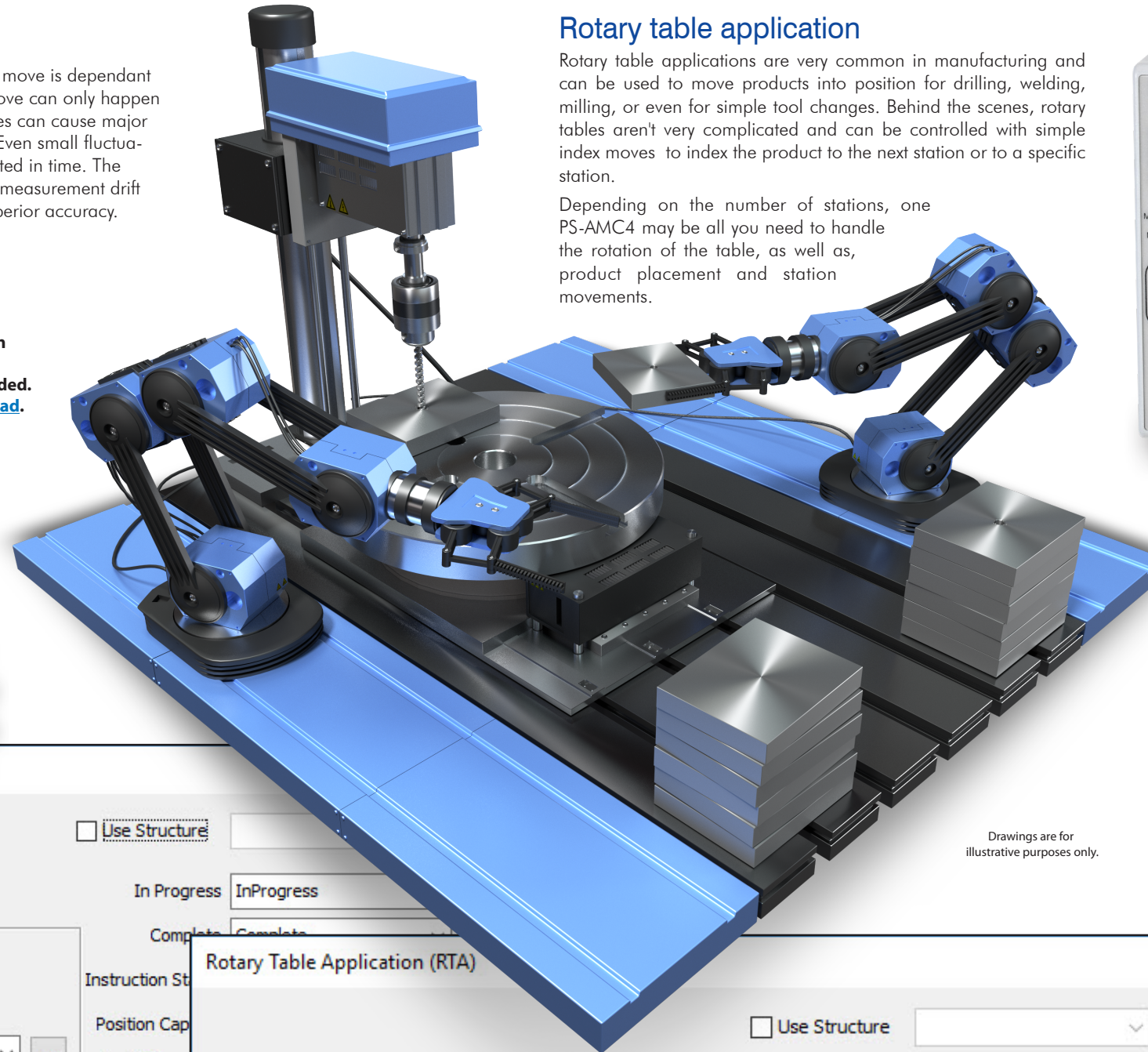
FREE SOFTWARE

FREE Software!
Download as often as you need.
No license or key needed.
Click here to download.

Rotary table application

Rotary table applications are very common in manufacturing and can be used to move products into position for drilling, welding, milling, or even for simple tool changes. Behind the scenes, rotary tables aren't very complicated and can be controlled with simple index moves to index the product to the next station or to a specific station.

Depending on the number of stations, one PS-AMC4 may be all you need to handle the rotation of the table, as well as, product placement and station movements.
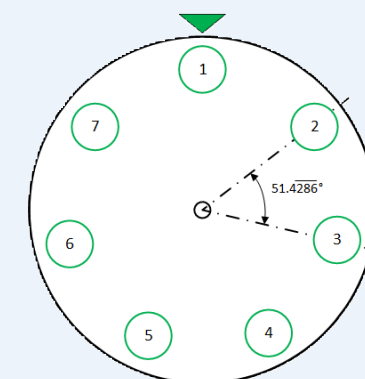
Productivity Motion

PS-AMC4

PS-AMC4
$542.00
4 AXES

Drawings are for illustrative purposes only.

On-the-fly position corrections with a single instruction

Manual Registration (MREG)

☐ Use Structure

Module Name: AMC-1

Drivetrain
☑ Use Encoder as Primary Master Axis

Master Axis: AMC-1-AXIS-1
Slave Axis: AMC-1-AXIS-2   Ratio: Ratio   ...

Capture Setup
☑ Position Capture

Capture Position On: ⦿ Master Axis ◯ Slave Axis

Position Capture Input: In2 - Pos Cap   Edge: Rising Edge

▶▶ Correction Distance: CorrDist   ... (pulses)
Max Correction Velocity: CorrMaxVel   ... (pulses/sec)
Correction Ramp Rate: CorrRamps   ... (pulses/sec^2)

☐ Show Instruction Comment

In Progress: InProgress
Complete: Complete
Instruction St
Position Cap
Last Correc

Rotary Table Application (RTA)

☐ Use Structure   ...

Axis Name: AMC-1-AXIS-1   ...
Module Name: AMC-1   Axis: 1

Abs Move Direction: Always Move Forward

Number of Stations: 7
Pulses Per Table Rev: PulsesPerRev   ...
▶▶ Index Speed: IndexSpeed   ... (pulses/sec)

In Progress: InProgress   ...
Complete: Complete   ...
Current Station: CurrentStation   ...
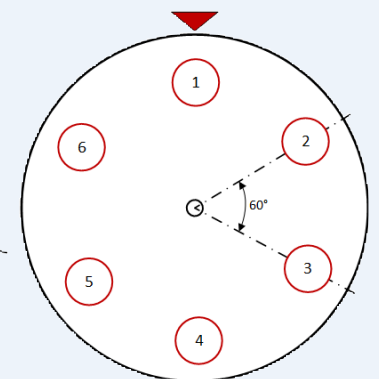Instruction Status: Status   ...

Stay on target!

One inherent problem with this type of application (as well as other continuous, same direction motion applications), is when the difference between steps/stations is fractional. If the controller doesn't account for these fractions, the system will drift. The PS-AMC controller takes this into consideration and will accurately handle fractional steps to prevent drifting over time and always remain on target.

7-station rotary table with fractional measurements

$51.4\overline{286}°$

6-station rotary table with non-fractional measurements

$60°$

A-M-C, easy as 1-2-3!

ProductivitySuite

▼AUTOMATIONDIRECT.com

1 INSTALL HARDWARE

Once your PS-AMC arrives, install the controller either locally to or remotely from the CPU and connect the needed Ethernet cable(s). Wire up the system, power the controllers, and download the free Productivity Suite software to your PC if you haven't already. At this point, you could use the software test tool in Productivity Suite to test the hardware and verify the physical wiring, otherwise on to step 2.

3 SET UP MOTION PROFILE

Productivity Suite has numerous built-in motion instructions that allow you to quickly and easily configure standard motion profiles like flying cut off, rotary tables, and more using simple drop-down selections. If you need something different, you can also create your own custom move profiles using the Motion Sequencer (MSEQ) instruction. Create your profile, download the updated project file to the CPU, and you are done!

BUILD YOUR OWN!
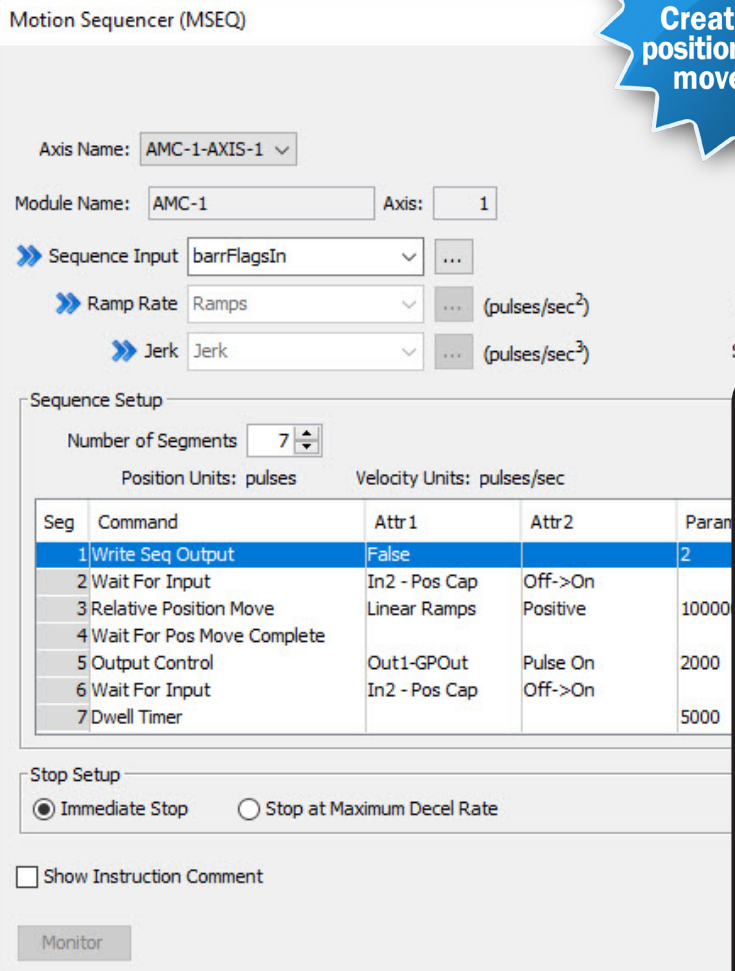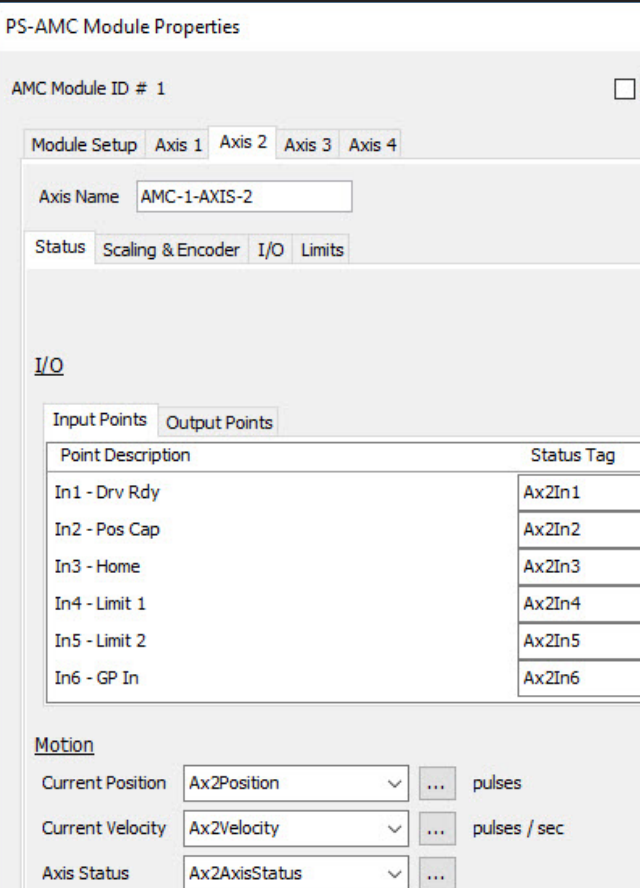Create custom position & velocity move profiles

Motion Instruction Set

AEN	AMC Axis Enable
AREG	Automatic Registration
FCO	Flying Cutoff
GEAR	Gear Drivetrain
HOME	Find Home
MREG	Manual Registration
MSEQ	Motion Sequencer
	Multi-Axis Motion Sequencer (MMSEQ)
PLS	Programmable Limit Switch
PST	Preset Table
REG	Registration
RTA	Rotary Table Application
SMOV	Simple Move
SPOS	Set Position
VMOV	Velocity Move
WAMO	Write AMC Outputs
WHSO	Write HS Outputs
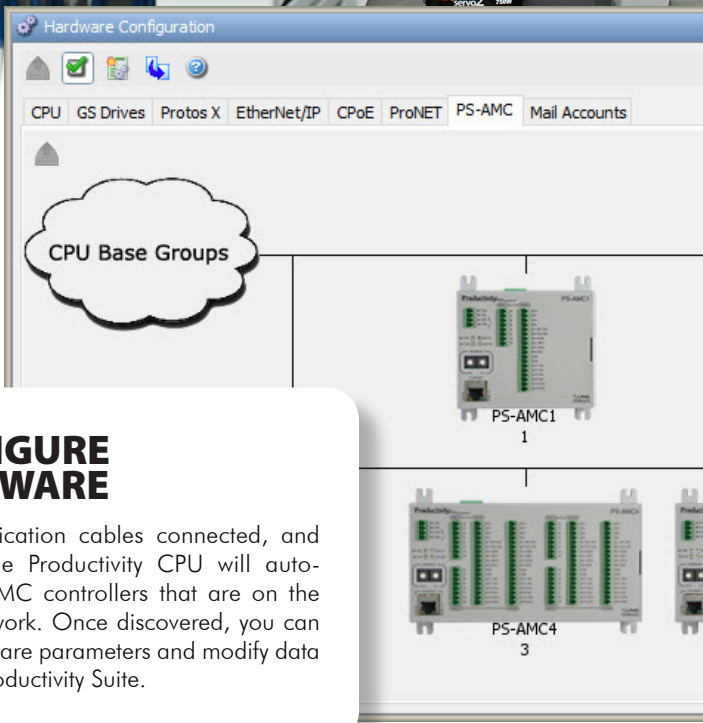
2 CONFIGURE HARDWARE

With the communication cables connected, and power applied, the Productivity CPU will auto-discover any PS-AMC controllers that are on the same Ethernet network. Once discovered, you can easily set the hardware parameters and modify data tags from within Productivity Suite.

Hardware Configuration

CPU GS Drives Protos X EtherNet/IP CPoE ProNET PS-AMC Mail Accounts

CPU Base Groups

PS-AMC1
1

PS-AMC4
3

PS-AMC Module Properties

AMC Module ID # 1

Module Setup | Axis 1 | Axis 2 | Axis 3 | Axis 4

Axis Name AMC-1-AXIS-2

Status | Scaling & Encoder | I/O | Limits

I/O

Input Points | Output Points

Point Description	Status Tag
In1 - Drv Rdy	Ax2In1
In2 - Pos Cap	Ax2In2
In3 - Home	Ax2In3
In4 - Limit 1	Ax2In4
In5 - Limit 2	Ax2In5
In6 - GP In	Ax2In6

Motion

Current Position Ax2Position pulses
Current Velocity Ax2Velocity pulses / sec
Axis Status Ax2AxisStatus

Motion Sequencer (MSEQ)

Axis Name: AMC-1-AXIS-1
Module Name: AMC-1   Axis: 1
Sequence Input barrFlagsIn ...
Ramp Rate Ramps ... (pulses/sec²)
Jerk Jerk ... (pulses/sec³)

In Progress InProgre
Complete Complet
Move Status Status
Current Segment Segment
Sequence Output barrFlagsOut ...

Sequence Setup

Number of Segments 7
Position Units: pulses   Velocity Units: pulses/sec

Seg	Command	Attr 1	Attr 2	Param
1	Write Seq Output	False		2
2	Wait For Input	In2 - Pos Cap	Off->On	
3	Relative Position Move	Linear Ramps	Positive	10000
4	Wait For Pos Move Complete			
5	Output Control	Out1-GPOut	Pulse On	2000
6	Wait For Input	In2 - Pos Cap	Off->On	
7	Dwell Timer			5000

Stop Setup

◉ Immediate Stop   ○ Stop at Maximum Decel Rate

☐ Show Instruction Comment

Monitor

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