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P3-32ND3

1230100 MPI P3-16ND3

P3-08ND3S

550E CPU

P3-64TD2

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website for de

Productivity 3000[®]

Productivity Series PLCs mPR3-1

Advanced control from AutomationDirect

It's our job to make you more productive



More Productive when specifying

With Productivity3000, we're giving you advanced features in a rugged PLC frame at a fraction of the cost compared to similarly equipped competitive products. Expansive communications capability built into the CPU is standard.

The FREE (\$495 value) full-featured Productivity Suite software lets you take a test drive before you buy, plus no licenses to register, track or transfer.

Practical prices

any base.

More Productive when programming

Programming and commissioning a system with any type of automation controller is time consuming and can be a large part of your overhead. We've created powerful processes in the programming environment to reduce your development time. Timesavers include combined ladder logic and function block programming; tag name database for easier documentation; task management that minimizes scan time; advanced instructions that simplify complex tasks, and an exhaustive HELP file that covers both hardware and software topics.



Process Control Motion Control www.automationdirect.com/Productivity3000 0405

Multiple HMI

Productivity₃₀₀₀[®]

Productivity

With Productivity3000, you can get all the power you need for advanced applications. The great thing is, even if you don't need every bell and whistle, you still get an easy-to-use, super-flexible machine that costs less than most traditional PLCs.

Who wouldn't want a controller that's a communications powerhouse with six built-in communication ports, easy local and remote I/O connection, Ethernet programming and an optional integrated LCD display - and that's just the CPU!





Large I/O

Count

Data

Collection/

Exchange

Networked

Communications

VAUTOMATIONDIRECT

High-speed

Operations

FREE SOFTWARE

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

Integrated Drive Control

PATENTED

ANALOG DATA DISPLAYS

ABS

Do these with ease



More Productive when configuring

It's pretty simple - install the CPU in a rack, add local and/or remote I/O, even GS series drives. There's no power budget to calculate or other restrictions - install any module in

Local and remote I/O ports are built into the CPU, as well as Ethernet and serial ports for device and network communications.

Once you've connected the components, let the system autodiscover the hardware configuration and save it in your project. Modules are then electronically keyed to prevent incorrect replacement.

Simpler means fewer mistakes







More Productive when troubleshooting

Run-time editing, hot-swappable I/O modules and onboard program documentation are tools that help you commission and troubleshoot your system more quickly and conveniently.

Use the built-in LCD display on the CPU for system diagnostics, configuration and troubleshooting.

The patented LCD interface built into each analog module allows you to view field signal levels without the hassle of an external meter.

Advanced Diagnostics



Advanced control and communications

For the latest prices, please check AutomationDirect.com.

Easily add low-cost basic motion control

to your Productivity3000 system

Plenty of I/O modules

• Up to 64-point DC I/O

• Up to 16-point AC I/O.

isolated or non-isolated

• Up to 16-point analog I/O;

• Up to 1MHz high-speed I/O

voltage, current or temperature

modules can be placed in

slot, in any base - no need

remember special restric-

tions or calculate power budgets.

And for critical systems, the hot-

swap feature can save you from a

To make I/O wiring fast and easy, use our ZIPLink cables and connector

field signals.

1/O

anv

modules.

downtime or worse.

to

Numerous I/O and specialty modules

capture and control a wide range of

Let technology simplify your job

Top Hardware Highlights FREE High-performance CPU (P3-550E) with 50MB SOFTWARE

- Modular rack-based footprint with a variety of discrete and analog I/O option modules, up to 59K+ I/O.
- Unmatched built-in communications capabilities
- Built-in EtherNet/IP Scanner and Adapter functionality
- MQTT support for easy IIoT/cloud networking
- Easy integration of PS-AMC motion contollers, GS series drives, and Protos X field I/O
- LCD on CPU for diagnostics

memory, fast scan time

- LCD on ALL analog modules helpful in troubleshooting and reading process values
- Hot-swappable I/O
- No module placement restrictions any module in any slot, any base
- No power budget limitations
- Optional I/O terminal blocks or easy ZIPLink plug-and-play wiring
- ABS certified for marine applications and a two-year warranty to boot!

High-performance CPU \$750.00, with 6 communication ports

The P3-550E has 50MB of memory and fast scan time (266MHz processor) - this CPU does the work of at least four or five pieces of hardware compared to other controllers. With its six built-in communication ports, it does the usual CPU stuff like storing and running the program, plus -

- Tag database and program documentation storage in CPU (Program pre-loaded on PC not necessary)
- USB local I/O expansion (no local I/O expansion master module needed)
- Ethernet remote I/O expansion (no Ethernet remote master module needed)
- High-speed Ethernet port for HMI and peer-to-peer or business system networking (no Ethernet communications module needed)
- Support for EtherNet/IP devices and MQTT connections
- Two serial ports for peripheral device interface or controller networking
- USB data logging right from the CPU





LCD aids troubleshooting

The built-in display can show system alarms and information, or it can configured be to display user defined messages with instructions triggered by the program.





P3-64ND3

Productivity₃₀₀₀[®]



Seamlessly integrates with select Productivity CPUs for coordinated motion control on up to four axes

Ethernet remote I/O like you've never seen

Connect up to 16 remote base groups from the P3-550E's Ethernet remote expansion port. Each remote group supports up to four additional local bases. You could end up with over 59,000 I/O points!



from the USB local expansion port.

USB local

I/O expansion

Connect up to four

additional I/O bases

custom device connections

RS485 serial port both support Modbus or ASCII protocols to connect to other controllers or peripherals.

Serial ports for master/slave or

One full/half duplex RS232 and one

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1 - 8 0 0 - 6 3 3 - 0 4 0 5











Field access with display on analog modules

The patented LCD on all analog modules gives you auick and easy access to field signal values - no need to drag out a multimeter or other measurement tool. Module and signal faults are also shown.

EtherNet/IP communication

With EtherNet/IP as a native protocol, we make it easier to connect to your existing devices. Whether you are configuring a new application or looking to expand an existing one, we can get you connected for less.

Connect to existing EtherNet/ IP enabled controllers, variable frequency drives and I/O.

Easy integration

Drive-intensive applications are a snap with this remote I/O network. Connect up to 32 AutomationDirect GS series AC drives on the Ethernet remote I/O network.

For coordinated motion applications you can also add up to 4 PS-AMC controllers to your remote I/O network, capable of synchronizing 4 axes of motion each.

Drives and AMC controllers are auto-discovered when configuration update is requested - it's that easy.





Add up to 16 remote

Remote Base Group

base groups!

Local Base Group

Let's start with the basics ...

Huge I/O capacity

Start with high-density I/O modules (up to 64 inputs or outputs per module) install those in an 11- slot base, and you've got over 700 I/O in a single rack! Add up to 4 local racks to your local base group, and the possible I/O total grows to over 3,500 I/O points.

Still need more? Add up to 16 Remote Slave racks, each with its own set of four local expansion racks and the number is truly staggering - well over 59,000 I/O points.

Software configurable I/O modules Most of the analog I/O modules allow software configuration - no dip switches to set! Just pull up the hardware configuration dialog box, and 128 MB DRAM select your range, resolution, etc. right on the screen. 50 MB User Memory P3-Buffer "A" 8IN / 4OUT, 16-BIT, VOLTAGE, ANALOG OMBO OUTPUT Automatic Module Verification Interna 50 MB No Verification and Enable Hot Swap Memory User Memory (Built-in) Buffer "B" Add Default Tags Remove Default Ta Ch. Sele Under Range Over Range Input Point User Tagname Resolution \checkmark Error Error 28MB \checkmark AIS32-0.1.1.1 0-10 V MST-0, 1, 1, 57 MST-0.1.1.89 Reserved \checkmark MST-0.1.1.58 MST-0.1.1.90 AIS32-0.1.1.2 0-10 V Fine System Memory \checkmark MST-0.1.1.59 MST-0.1.1.91 AIS32-0.1.1.3 0-10 V Fine \checkmark AIS32-0.1.1.4 MST-0.1.1.60 MST-0.1.1.92 0-10 V Fine USB Flash Drive Additiona AIS32-0.1.1.5 \checkmark MST-0.1.1.61 MST-0.1.1.93 0-10 V Fine (USB Port on CPU) Memory AIS32-0.1.1.6 \checkmark MST-0.1.1.62 MST-0.1.1.94 0-10 V Fine (Optional AIS32-0.1.1.7 \checkmark MST-0.1.1.63 MST-0, 1, 1, 95 0-10 V Fine AIS32-0.1.1.8 \checkmark MST-0.1.1.64 MST-0.1.1.96 0-10 V Fine Output Range 0-10 V 🗸 Status Bit User Tagname Module Failed MST-0.1.1.25 Stop Mode Output Point User Tagname Missina 24V MST-0.1.1.26 AOS32-0.1.1.1 AOS32-0.1.1.2 AOS32-0.1.1.3 AOS32-0.1.1.4 Module Info Monitor OK Module status bits Module Status Bits (MST) are automatically created for each module when you select (or auto-discover) that module in your hardware configuration. These **FREE Software!** bits are added to your tagname database and you FREE can change or augment the tagnames to be even

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For the latest prices, please check AutomationDirect.com.

... Power AND Grace!

Tremendous processing power

The P3-550E CPU's lightning fast processor executes your ladder code quickly and efficiently!

Sub-millisecond scan times

The performance benchmark used for testing the Productivity3000 includes 3 kbytes of Boolean logic, and 1k of I/O. The Productivity3000 CPU consistently executes this test with a scan time of less than 650 microseconds.

Powerful and efficient

This processing power also means that there are practically no limits on the number of timers, counters, and PID loops for your application. And the powerful task management tools built in to the software help you streamline your ladder code for maximum efficiency.

User Memory is divided into 2

"swapped" on the fly for "Run

User Memory is used to store:

Communications Tables

Configuration and Setup Info

Histogram Data
 Limited (72KB) Data Logging

The User Memory and Reserved

System Memory are loaded from built-in FLASH memory on

Use additional memory for:

Project Back-up/Restore

Project Transfers

PLC Data Logging

Alarm Logging

50MB buffers, which are

Time Edits". If Stop Mode transfers are selected, only

one buffer is used.

User Documentation

■ Tagname Database

Ladder Logic

ower-up.

Hot swap I/O modules Save time and avoid long start-up opera-

tions or other down-time related inconveniences. All Productivity3000 I/O modules support hot-swap.

Electronic keying

Once you have determined the desired placement of the I/O modules in your Productivity3000 system, you can enable electronic keying to prevent inadvertent rearrangement or improper replacement of any I/O module.

more descriptive.

Use these MST bits for error checking and reporting,

and to simplify the troubleshooting process.

SOFTWARE



Generous 50 MB of memory

Plenty of storage for your program AND..

Documentation stored on-board

Store your entire project with ALL documentation in the CPU, and never hunt for that old laptop again. You know, the only one that has the updated code from last year when you made all those changes. Sure, we recommend that you keep a backup of all your code and documentation, but who hasn't been burned by this classic PLC problem?

Place any module in any slot

You can install any I/O module in any I/O slot of any base in a Productivity3000 system with no restrictions. The only fixed positions are shown in the figure below; a power supply must be in the power supply slot, and one of the three controllers must go in the CPU slot. Other than this, there are no special slots or rules governing placement of your discrete, analoa, or specialty I/O modules.





Work smarter ...

... with these intelligent strategies

Schedule interval to create a n Interval Orver Hour Orver prove Once per Day Once per Week Once per Week Once per Week Once per Month Lug System Errors and Events File Name (A text file with no extension added automatically) Taggames To Log Ocerant Name of the Errors	ew CSV file <u>Star</u> Minute Hour Day Day of Month	t Time	0
Interval Every Hour Once per Day Once per Week Once per Week Conce per Month Log System Errors and Events File Name (A text file with no extension added automatically) Tagnames To Log Oncent Nam atical Error	<u>Star</u> Minute Hour Day Day of Month	t Time	0
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Data logging

The Productivity3000 accepts USB-Flash drives and offers this easy-to-configure Data Logger dialog box shown at left. USB drives can be used to log system errors or any type of controller data. Log up to 64 tag values for up to 32GB of data storage. Capture data periodically or when certain events occur.

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ANALOG DATA DISPLAYS

1



USB drives can also be used to upload or download a project to/from a Productivity3000 without having a PC present. This feature is great for updating remotely located CPUs - just send your project on a USB drive to any factory in the world, and the controller can be updated with the most current files.

Advanced diagnostics

Patented LCD on all analog modules!

All Productivity3000 analog modules have a four-line LCD on the front panel which provides a quick and easy way to troubleshoot many problems without needing a meter or a PC. Just as you can quickly check the front panel of a discrete module to determine the state of an I/O point, now you can check the status of your analog signals just as easily.

Non-invasive measurements

The LCD allows non-invasive measurements; no need to connect a multimeter in line with the analog signal (which might even affect the signal being measured). View the signal in volts or milliamps (depending on the module) or view the resulting tag value - i.e. 0-65535 (Decimal or Hex) that is being processed by the CPU.



LCD on CPU aids troubleshooting

The built-in display on the CPU can show system alarms and information, or it can be configured to display user defined messages with instructions triggered by the program.



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



Sent: Thursday, January 21, 2010 4:30 PM







Built-in e-mail capability

If your Productivity3000 is on a network with an SMTP server, it can send e-mails right from your ladder logic. Embed tag data or attach the most current data file for even more informative messaging. The Send Email instruction makes it simple.

Remote slave connectivity options

Main

The Remote slave module installs in the CPU slot of the first base in each remote base group. It includes two serial communication ports (both supporting Modbus RTU Master/Slave and ASCII In/Out up to 115.2K baud rate): one (1) RS-232 port and one (1) RS-485 port. So each of your remote base groups can connect to additional serial devices.

Auto-discover field I/O

The Protos X field I/O system has been integrated into the Productivity PLC's hardware configuration allowing for quick and easy setup of your field I/O points. You can read in your field I/O configuration with a click of a button, modify as needed, and save the configuration with your PLC project.





Affordable ZIPLinks save hours of wiring

We strongly recommend the use of ZIPLink cables and wiring modules, which eliminate the need for hand wiring of I/O modules to DIN rail terminals. In fact, many of the Productivity3000 I/O modules do not include the terminal block for direct connection of I/O. In particular, the high-density (32-point and 64-point) modules require the use of the ZIPLink cables (there simply isn't enough room on the front of these module to terminate that many I/O points).

Choose a ZIPLink module and cable...



mPR3-8 Productivity Series PLCs

VAUTOMATIONDIRECT

Use the convenient ZIPLink selector tool to help you find the right ZIPLink modules and cables for your I/O connections.

ZIPLink Selector







... all built in to the CPU!

Incredible communications capabilities ...

Six ports on the P3-550E CPU

The P3-550E CPU has six ports available to handle a variety of communication needs. You shouldn't have to pay extra or take up valuable slots for each communication port required to solve your application. From Ethernet remote I/O to database connectivity, the Productivity3000 is designed to meet your communication needs.

Two Ethernet ports

CPU programming and

monitoring including:

• Real-time data view

Task management

• CPU configuration

PLCs

ViewMar

mPR3-10 Productivity Series PLCs

Ladder logic editing

• Error history monitoring

The P3-550E CPU has two built-in Ethernet ports. One connects to Remote Slave I/O racks (up to 16), Protos X field I/O racks (up to 4), up to 4 PS-AMC motion controllers and up to 32 variable frequency drives. The other can connect the CPU to HMIs, other controllers, EtherNet/IP devices, cloud computing platforms using MQTT, and to your factory network.



Two serial ports

The P3-550E CPU has two serial ports built in:

• One (1) full/half duplex RS-232 (RJ12) • One (1) RS-485 (3-wire terminal block) • Add up to 44 additional serial ports with SCM modules

Built-in ports support: •Modbus RTU Master connections •Modbus RTU Slave connections •ASCII incoming and outgoing communications •Custom Protocol incoming and outgoing communications

ASCII communications

Use ASCII communications instructions to send and receive non-sequenced String data via a serial port. ASCII communications are typically used for receiving bar code strings from a scanner or sending statistical data to a terminal or serial printer.

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1 - 8 0 0 - 6 3 3 - 0 4 0 5

Productivity_{Series}

Overview and Intro

AutomationDirect.com EtherNet/IP EDS files are preloaded in the library for

convenience

Click the video link for a collection of videos on

using EtherNet/IP with Productivity PLCs

Connect up to 32 VFDs

Connecting your Productivity3000 to variable frequency drives couldn't be easier! Connect up to 32 of our GS series drives via Ethernet, and the Productivity3000 will automatically detect them. The auto-discovery process eliminates the configuration headaches - your drives are ready to program in just a few minutes.

After the auto-discovery process, the dedicated instructions "GS Drives Read" and "GS Drives Write" will prompt the programmer with all the available parameters (in both "run mode" and "stop mode") that can be configured for each model of drive - then it's a cinch to fill in the blanks and program your drives!

Perfect match for our C-more HMI

Export your tagname database from the Productivity3000 and import it into C-more software to jumpstart your HMI development. No more digging through your notes, or hunting through your ladder logic to find the right tagname.



Write your own protocol if needed

Send and receive non-sequenced byte arrays with the custom protocol capability. This function is typically used for communicating with devices that don't support the Modbus protocol but do support some other serial protocol.



For the latest prices, please check AutomationDirect.com.

Compatible with MQTT brokers and cloud platforms/services

including: IBM Watson® Mosquitto[®]

HiveMQ[®]

Thingsboard[®]

We make cloud communication easy

Industrial machines/systems are more connected than ever before, whether internally with upstream IT management systems or externally with remote support personnel, modernday plant-floor machines/systems need to communicate to a variety of networks. Cloud networking, with its computing and data storage platforms, has also become a viable solution for analyzing and accessing production data from anywhere at anytime. Using powerful cloud platforms such as Microsoft Azure® or IBM Watson® to analyze production-floor data can provide better process efficiency, improved plant-wide resource management and less operational downtime.

But how does data from a simple level switch on a tank get to the cloud? With Productivity PLCs, it easy! Productivity PLCs have the communication capabilities and processing power needed to not only control plant-floor machines but gather valuable data from them, package it, and send it on to higher level analysis systems.

Multiple data gathering options

Productivity PLCs offer many I/O options to choose from for your system data collection. I/O modules, available in analog, discrete, high-speed, relay, and temperature versions, allow you to create the custom I/O configurations your application needs. And with Modbus RTU, Modbus TCP and EtherNet/IP protocol support, Productivity3000 PLCs can easily gather raw data from a variety of VFDs, sensors, switches, encoders, pilot devices, or almost any other control component your system may have.



Refining data into something meaningful

The Productivity Suite programming software makes refining raw data into a meaningful metric a cinch. With a multitude of simple-touse instructions combined with the computing power of a Productivity CPU, Productivity Suite can easily transform a raw process signal, like 4-20mA, into a consumption rate, a production throughput, an energy efficiency



machine(M2M) and IIoT/cloud networking

applications, due to its lightweight overhead

and reduced bandwidth consumption.

Productivity PLCs support MQTT communication

MQTT Client Properties

Device Name (Client ID) HiveM

▲ 🗹 🔂 🔖 🥹

MQTT

PU GS Drives Protos

vital data to advanced cloud computing platforms is easy.

and with fill-in-the-blank MQTT messaging configurations, delivering

Use Structure MQTT Client

Connected Connected

Error Error

VAUTOMATIONDIRECT



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

labaaa

aaaaaaa



N1 DBV BD

IN2 POS CAP

N3 HOME

N4 LIMIT1

N5 LIMIT2

1 GP SRC

T2 EN SNK

DUT2 EN SRC

UT3 ATR SNK

DUTS ATR SRC

N1 DRV RDY

N2 POS CAP

N3 HOME

4 LIMIT

N5 LIMIT2

UT1 GP SRC

UT2 EN SRC

IT3 ATR SNK

IT3 ATR SBC

PS-AMC4 **PS-AMC** motion controller provides coordinated motion control with easy-to-use. built-in application instructions

N1 DRV RDY

IN2 POS CAP

N3 HOME

N4 LIMIT1

N5 LIMIT2

N6 GPIN

T2 EN SRO

IT3 ATR SN

DUTS ATR SRO

DIR+

IN1 DRV RD

IN2 POS CAR

IN3 HOME

N4 LIMIT

N5 LIMIT2

N6 GPIN

COM



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ENC1)

Starting at only \$331.00

Productivity

AC RDY

MC 24V 🌉 🌉 AU

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...

OUT1 GP SNK			
Feature/Instruction/Application	PS-AMC	P3-HSI	P3-HSO
Find Home (HOME)	\checkmark		\checkmark
Programmable Limit Switch (PLS)		\checkmark	
Preset Table (PST)		\checkmark	
Registration (REG)		\checkmark	
Manual Registration (MREG)	\checkmark		
Auto Registration Correction (AREG)*	\checkmark		
Simple Move (SMOV)	\checkmark		\checkmark
Multi-Axis Motion Sequencer (MMSEQ)	\checkmark		
Set Position (SPOS)	\checkmark	\checkmark	\checkmark
Velocity Move (VMOV)	\checkmark		\checkmark
Write HS Outputs (WHSO)		\checkmark	\checkmark
Write AMC Outputs (WAMO)	\checkmark		
Electronic Gearing (GEAR)*	\checkmark		
Rotary Table Application (RTA)*	\checkmark		
AMC Axis Enable (AEN)	\checkmark		
Flying Cutoff (FCO)*	\checkmark		
Motion Sequencer (MSEQ)*	\checkmark		
Coordinated Motion	\checkmark		
Max # Axes per Motion Controller or Motion Module**	4 (PS-AMC4)	2	2

For the latest prices, please check AutomationDirect.com Productivity 3000 **P3-550ECPU** -**VAUTOMATIONDIRECT** P3-01AC

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 P3-HSI and P3-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 Productivity3000 system.

* Application-specific instructions ** Up to four PS-AMC controllers can be connected to a Productivity3000 CPU for up to 16 axes total





P3-HSI / P3-HSO Modules

P3-HSI priced at \$563.00 / P3-HSO priced at \$587.00



he latest prices, please check AutomationDirect.com.

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.

Flying cut-off application

mPR3-16 Productivity Series PLCs

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 cutter¹, a continuous pipe infeed system², carriage positioning drive³, and outbound conveyor⁴. 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!

			-e 7					Prod
	Drawings are for illustrative purposes only.	×× (Set aver			PS-AMC3 \$472.00 3 AXES	MC RDY
	Flying Cutoff (FCO)		BUILT-IN MOT			×		ACT
synchronize the	Module Name: AM Direction of Master Po	C-1 V		In Progress In Complete Construction Status St	Progress omplete	 		Prod
aterial to make se applications	Synchronized Tool Output No	ne v		Cycle Count Cy	ydeCount	×	PS-AMC4	
t a continuous	DriveTrain Tracking Start	Tracking Finish aster Axis					\$542.00	MC RDY
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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 autodiscovery of the AMC units





Drivetrain				Complete	Constate
				Complete	Complete
Use Encoder a	s Primary Master Axi	S		Instruction Status	Status
Master Axis	AMC-1-AXIS-1 $ \sim$			Last Correction	LastCorrection
Correction Axis	AMC-1-AXIS-2 $ \smallsetminus $	Ratio	CorrectionRatio ~		
Use Accumulat	ion Axis				
Accumulation Axis	AMC-1-AXIS-3 $ \smallsetminus $	Ratio	AccumRatio 🗸	•••	









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.

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!** Download as often as vou need. No license or key needed. Click here to download.

On-the-fly position corrections with a single

instruction

Manual Registration (MREG)

FREE

SOFTWARE

Drivetrain -			
Use Enc	oder as Primary Mast	ter Axis	
Master Axis	AMC-1-AXIS-1 $ \smallsetminus $		
Slave Axis	AMC-1-AXIS-2 $ \smallsetminus $	Ratio	Ratio
Capture Set	tup Capture		
		a Auria	

>>> Correction Distance | CorrDist

Max Correction Velocity CorrMaxVel

Correction Ramp Rate CorrRamps

mPR3-22 Productivity Series PLCs

Use Structure	

Position Cap

Last Corre

×

Rising Edge 🗸

(pulses)

(pulses/sec)

(pulses/sec²)

....

....

....

In Progress InProgress

Rotary Table Application (RTA) Instruction S

Axis Name: AMC-1-AXIS-1 ~

Module Name: AMC-1

Abs Move Direction Always Move Forward ~

Number of Stations 7

Pulses Per Table Rev PulsesPerRev

>>> Index Speed Index Speed 0 5

Rotary	table	app	licatior
--------	-------	-----	----------

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.

Use Structure

Axis:

~ ...

 \sim

....

In Progress InProgress

Current Station CurrentStation

1 Complete Complete

Instruction Status Status

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.



PS-AMC4 \$542.00 **4 AXES**

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.



(pulses/sec) omation direct.com/Productivity3000

Drawings are for

illustrative purposes only.

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V

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Productivity[®]Motion</sup> ē000

				PS-AMC
)		ENC3	XIS3	
STP+	STP+	A+	STP+	STP+
STP-	STP-	- A-	STP-	STP-
DIR+	DIR+	B+	DIR+	DIR+
DIR-	DIR-	B-	DIR-	DIR-
IN1 DRV RDY	IN1 DRV RDY	Z+	IN1 DRV RDY	IN1 DRV RDY
IN2 POS CAP	IN2 POS CAP	Z-	IN2 POS CAP	IN2 POS CAP
IN3 HOME	IN3 HOME	5V	IN3 HOME	IN3 HOME
IN4 LIMIT1	IN4 LIMIT1	ov I	IN4 LIMIT1	IN4 LIMIT1
IN5 LIMIT2	IN5 LIMIT2		IN5 LIMIT2	IN5 LIMIT2
IN6 GPIN	IN6 GPIN		IN6 GPIN	IN6 GPIN
СОМ	СОМ	A+	сом	СОМ
СОМ	СОМ	A-	сом	СОМ
OUT1 GP SNK	OUT1 GP SNK	B+	OUT1 GP SNK	OUT1 GP SNK
OUT1 GP SRC	OUT1 GP SRC	B-	OUT1 GP SRC	OUT1 GP SRC
OUT2 EN SNK	OUT2 EN SNK	Z+	OUT2 EN SNK	OUT2 EN SNK
OUT2 EN SRC	OUT2 EN SRC	Z-	OUT2 EN SRC	OUT2 EN SRC
OUT3 ATR SNK	OUT3 ATR SNK	5V	OUT3 ATR SNK	OUT3 ATR SNK
OUT3 ATR SRC	OUT3 ATR SRC	OV N	OUT3 ATR SRC	OUT3 ATR SRC
	(192)	ENC4	AX	154)



Stay on target!

Productivity Series PLCs mPR3-23



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

For the latest prices, please check AutomationDirect.com.

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.





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1 - 8 0 0 - 6 3 3 - 0 4 0 5

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- pack-

Productivity Series PLCs mPR3-25

Practical motion control for simple systems

The P3-HSI/HSO modules are a great option for basic motion control applications. Combined with the numerous communication abilities built into the P3-550E CPU, these modules give you a very practical motion solution for a lot less than the cost typically associated with motion. But don't let the price fool you. These little guys can stand head-to-head with modules you've been paying much more for.

Use the P3-HSI High-speed Input Module for high-speed counting and registration functions.

The P3-HSI is a high-speed (1MHz) input module that has both differential and single-ended inputs. This module accepts Pulse/Direction and Quadrature signals on each of two independent input channels. It also provides four general purpose high-speed inputs and four general purpose 5-24VDC @ 0.5 Amp outputs.



For the latest prices, please check AutomationDirect.com.

Use the P3-HSO High-speed **Output Module for simple** moves, velocity moves, and flexible homing routines.

For the latest prices, please check AutomationDirect.com.

The P3-HSO is a high-speed (1MHz) output module that supports Pulse/Direction, Step Up/ Step Down and Quadrature pulse outputs on each of two independent output channels. It has both line driver and open drain outputs. Additionally, it has six general purpose inputs and four general purpose outputs.

And with Productivity Suite's built-in instructions, like Find Home (HOME), Simple Move and Velocity Move (SMOV), it's easier than ever to program routines based on target position, target velocity, accel rate, decel rate, and more.

Use Structure

2

Axis/Channel:

Initial Travel Direction

Switch 1 Definition

Switch 2 Definition

(pulses/se

1

Positive
 Negative

In Progress InProgress

Complete Complete

Edge 1 Transition

Edge 2 Transition

Rising Edge
 Falling Edge

Rising Edge
 Falling Edge

Move Status Status

Pneumatic stamping application

The Registration (REG) instruction can trigger several internal and external position based events such as the capturing of positions, setting a tag, counting events and turning on, off or pulsing an output. The action can also be delayed by a set number of pulses as in this pneumatic stamping application. The P3-HSI module is used to accurately stamp parts as they move past on a conveyor. A blank part is detected by the sensor and the instruction is triggered. The output or stamping function is delayed by the appropriate number of encoder pulses. Once the part travels to the precise location under the stamp, the pneumatic stamp is activated and the image is stamped onto the part.





High Speed Steppe	Output Module						
Module Setup C	nannel 1 Setup	Channel	2 Setup				
Channel Name	CHAN-1-0.1.1						
Scaling							
Position Unit	O Pulse						
	O Standard		inch	~	-	1.0	pulses
	Custom	Name	Widgets		-	5.0	pulses
Position Datatvo	e () Integer						
Position Datatyp	e Integer Float	Minimu	um Position	Accuracy 0.1	~ w	idaets	
Position Datatyp	e Integer Float Maximum Po	Minimu Isition Cyr	um Positior de: -429,	Accuracy 0.1 496,729 to 4	V W	idgets 29 Widge	ts
Position Datatyp	e Integer Float Maximum Po Standard	Minimu Isition Cyr	um Position de: -429, second	Accuracy 0.1 496,729 to 4	W 129,496,72	idgets 29 Widge	ts
Position Datatyp	 Integer Float Maximum Po Standard Custom 	Minimu Isition Cyr Name	um Positior de: -429, second	Accuracy 0.1 496,729 to 4	W 129,496,72	idgets 29 Widge 1.0	ts seconds
Position Dataty; Time Unit <u>Feedback</u>	 Integer Float Maximum Pc Standard Custom 	Minimu Isition Cyr I Name	um Position de: -429, second	Accuracy 0.1 496,729 to 4	W 129,496,72	idgets 29 Widge 1.0	ts seconds
Position Datatyp Time Unit <u>Feedback</u> Current Position		Minimu Isition Cyr Name	um Position de: -429, second	Accuracy 0.1 496,729 to 4	W 129,496,72	idgets 29 Widge 1.0	ts seconds
Position Datatyp Time Unit <u>Feedback</u> Current Position Current Velocity	e integer Float Maximum Pc Standard Custom PV POS PV VEL	Minimu Isition Cyr Name	um Position de: -429, second	Accuracy 0.1 496,729 to 4 . Widgets . Widgets / se	W 129,496,72	idgets 19 Widge 1.0	ts seconds

Easy configuration

Both the High Speed Input (P3-HSI) and High Speed Output (P3-HSO) modules can be configured using Productivity Suite's intuitive function blocks. Simply define your tags for each input/output channel on the appropriate Channel (1 or 2) Setup Tab.

Pick and place application

The Find Home (HOME) instruction initializes this pick and place application on power-up. Homing routines are used to align the P3-HSO channel position to a known real-world physical position. Choose from four preconfigured move routines and simply identify the desired speed, direction and acceleration.





[THC] Timed Coil

[TGC] Toggle Coil

E Applica

IIG Average

CHG Change of Value

Alarr

Fast Programming with FREE downloadable software

Countdown Preset-Timer Ac



Developed in-house with customer feedback

Productivity Suite is our free programing software for the Productivity family of controllers. Our own software engineers developed this programming package at our headquarters near Atlanta, Ga. It was designed with input from our technical service team who communicate on a daily basis with our customers. As a result, Productivity Suite not only meets but exceeds the needs of our customers, and provides a guick, user-friendly way to efficiently program the Productivity family of PLCs.



With Productivity Suite you have the freedom to define user tags with no limits or fixed boundaries. Configure timers, counters, integer words or any other data types you need. With tag name based programming, there are no pre-defined, fixed memory maps and no wasted, unused memory allocations.

Tag name based control also offers the ability to descriptively identify the control elements in your program. Older, fixed memory controllers force the use of pre-defined nomenclature for the data types. Which would you rather see when troubleshooting: T4:01 or Oven1 Purge Timer.Pre? The tag name helps identify the element as a numeric value for the oven purge timer's preset, making its purpose immediately clear.

Variable communication

Productivity Suite provides utmost flexibility when it comes to PLC communication and with the Variable Communications Instructions (VCIs), you can reconfigure your communication links with simple tag value changes. By using tags in the parameter fields of Modbus, serial, EtherNet/IP, MQTT, etc. configurations, you can dynamically modify the messages, target IP addresses, and other connection parameters from the ladder code or directly from a connected HMI.

Network Read/Write (NETW)			×	CO
	Use Structure	PLC_Network_MB	×	
Modbus Device Prod_PLC_MB <>	In Progress	PLC_Network_MB.InPro	v	
Instruction Type Network Read 😔	Complete	PLC_Network_MB.Comp	v	
Polling Options	Success	PLC_Network_MB. Succe	v	
Automatic Poling	Error	PLC_Network_MB.Error	v	
Poling Frequency PLC_Network_MB.PolFr V msec	Timeout	PLC_Network_MB.Timec	v	
Poling Offset PLC_Network_MB.PolO: V msec	Exception Response String	PLC_Network_MB.ExcRe	×	
Skip execution if buffer is greater than PLC_Network_NB.SkipP	Refresh Remote Proje	ect Tag Selections Re	fresh	
Tag Mapping: O Non-Array O Array @ String		\checkmark	AUTO	, DMATIONDIRI
String Mapping				



ONE SOFTWARE PACKAGE PROGRAMS ALL PRODUCTIVITY PLCS!

Easy access control

The Productivity Suite software has several remote access security features built in including project file encryption and user roles. User roles allow you to control who has access to the project file and what they can do with it. Full control, full monitor, limited monitor, and read only are some of the roles available and they can be easily set from the User Account dialog.

	Min. password length
Password	Confirm Password
Role Full Control V	
System Settings	-
Recovery Questions	
Question 1	Answer
	Annuar
Question 2	PI ISWEI





Simple simulation

There is no better way to get a head start on project development than building code ahead of time with the assistance of a project simulator. Now you can start your logic early and verify it's operation even before the hardware has arrived!

Simply select the "Simulator" option in the toolbar, transfer your code as you would with a real CPU, turn on monitoring and/or open a Data View window, and start testing your code. This tool comes in handy not only with new builds but also when maintaining existing systems. With systems that are already live, and where a shutdown may be required, getting in and getting out quickly is crucial and the simulator is there to help make sure there won't be any surprises.

Advanced user defined structures

User defined structures (UDS) are a powerful tool that helps speed up program development and improve uniformity of your logic. A UDS is a group of data types (BOOL, FLOAT, INT, pre-defined structures, etc.) which are defined by the user and re-used at will.

Productivity Suite allows you to embed arrays within the UDS definition, as well as, create arrays of structured tags so that you can programmatically index through your tag variables.

For example, Mixing Tank(1).Transfer Pump(2).VFD.RUN Command which contains two nested UDS arrays (Transfer Pump and VFD) inside the Mixing Tank UDS definition

Tag Database					
-Tags to show -					
Show All	Discrete I	inputs		Anal	og Inputs
Invert	Discrete (Dutpu	ts 🗌	Anal	og Outputs
	Module St	tatus		PDS	Structures
Editor					
Name		T	ype		
Mixing_Tar	nk	S	tructur	e, Use	er, 1D, Tanl
Name				Syst	tem ID
 Mixing_ 	Tank(1)			AR	USTRUG-00
Name		Туре			
Lev	el	Integ	ger, 16	Bit U	nsigned
Ten	np	Float	t, 32 Bi	t	
Mixe	er_On	Boole	ean		
Cold	orfer Dump	Strue	g thure l	lear	1D Transfe
	rister_Pump	3000	cure, c	JSCI,	1D, mansie
	ne				System ID
	Transfer_Pump(1)				AR2USTR
	Transfer_Pump(2)				AR2USTR
	Name		Туре		
	Flow_Rate		Float	32 B	it
	Vibration_Sensor		Integ	er, 16	5 Bit Unsign
	VFD		Strue	ture, i	Usen, VFD=
	Name		Ту	pe	
	Running		Bo	olean	
	Stopped		Bo	olean	
	Faulted		Bo	olean	
	Run_Comman	d = =	• • Bo	olean	
	Speed_Comma	and	In	teger,	, 16 Bit Uns
	Actual_Speed		In	teger,	, 16 Bit Uns
	HP_Rating		St	ing	40.000000
	Transfer_Pump(3)			40.4	AR2USTR
Mixing	Tank(2)			AR I	USTRUC-00
es Moong	Torik(0)			AKI	001100-00
		_	_	_	
Add Tags	Delete Tags	Re	tentiv	e Me	emory: 0 o

There's so much more! See all that Productivity Suite has to offer at: www.ProductivityPLC.com

www.automationdirect.com/Productivity3000



f 491520 bytes Forceable tag count: 9 of 64

CPU Project Status Up to Date

Reset Ta

Increase your productivity in more ways than one!

The Productivity Series offers a scalable controls solution with three low-cost hardware platforms and one FREE, powerful programming package. No matter the application, big or small, Productivity has the I/O, communications and affordability you need.

St Clay	Counting -	Shippin &		Engineered in	formany products	Located in USA
Construction C	Alexander de la			ACCORDENT OF CONTRACTOR OF CON		Delawe: 17.41:10:1 Image: 17.41:10:10:1 Image: 17.41:10:10:1 Image: 17.41:10:10:1 Image: 17.41:10:10:10:1 Image: 17.41:10:10:10:10:10:10:10:10:10:10:10:10:10
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	Productivity3000	Producti	vity2000	Productivity1000			
Feature	P3-550E CPU	P2-550 CPU	P2-622 CPU	P1-550 CPU	P1-540 CPU		
User Display on CPU	>	~	 ✓ 				
Built-in USB Programming Port		~	~	~	~		
Built-in Serial Ports (RS-232 & RS-485)	2	2	2 (each configurable for RS-232 or RS-485)	2	2		
Built-in Multipurpose Ethernet Ports (RJ45)	1	1	Up to 2*	1	1		
EtherNet/IP Protocol	~	~	~	✓	~		
MQTT Protocol	v	~	(also supports MQTTS)	~	~		
Modbus RTU (serial) & Modbus TCP (Ethernet)	~	~	~	~	~		
Remote I/O Expansion Rack Support	~	~	✓*	v			
Local I/O Expansion Rack Support	>						
Max Productivity I/O Capacity	59,840 (using P3-RX and P3-EX modules)	4,320 (using P2-RS modules)	4,320 (using P2-RS modules)	752 (using P1-RX modules)	240 (local modules only)		
Hot Swappable I/O	v	v	~				
Integrated GSDrive Support	3 2 max.	✔ 16 max.	✓* 16 max.	✔ 16 max.			
PS-AMC Support	>	>	✓*	✓			
Data Port (data logging & project transfer)	∨ USB	microSD	microSD	✓ microSD**	✓ microSD**		
Total Memory	50 MB	50 MB	50 MB	50 MB	50 MB		
Average Scantime (µsec) (1K boolean, 128 I/O)	380	200	200	1500	1300		
American Bureau of Shipping (ABS) Certification		~					
Price	\$750.00	\$361.00	\$299.00	\$268.00	\$237.00		
* For 2 multipurpose Ethernet ports, Remote I/O port must be configured for multipurpose use. Remote I/O port cannot be used for native remote I/O							

* Project transfer from the microSD card is not supported in the Productivity1000 CPUs.

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