Up-to-date price list:
www.automationdirect.com/pricelist

FREE Technical Support:
www.automationdirect.com/support

FREE Videos:
www.automationdirect.com/videos

FREE Documentation:
www.automationdirect.com/documentation

FREE CAD drawings:
www.automationdirect.com/cad

P1-550
Productivity 1000

RUN PWR
RUN
STOP CPU

P1-15CDD1
12-24VDC IN
3.3-24V OUT

P1-02HSC
5-24VDC INPUT

P1-15CDD2
12-24VDC INPUT/OUTPUT

P1-04ADL-1
0-20mA INPUT ANALOG

P1-04THM
THERMOCOUPLE INPUT

100-240V ∼ 48VA
50-60Hz
125VDC, 20W

AC (L)   DC (+V)
AC (N)   DC (-V)
G
LG

Productivity® 1000
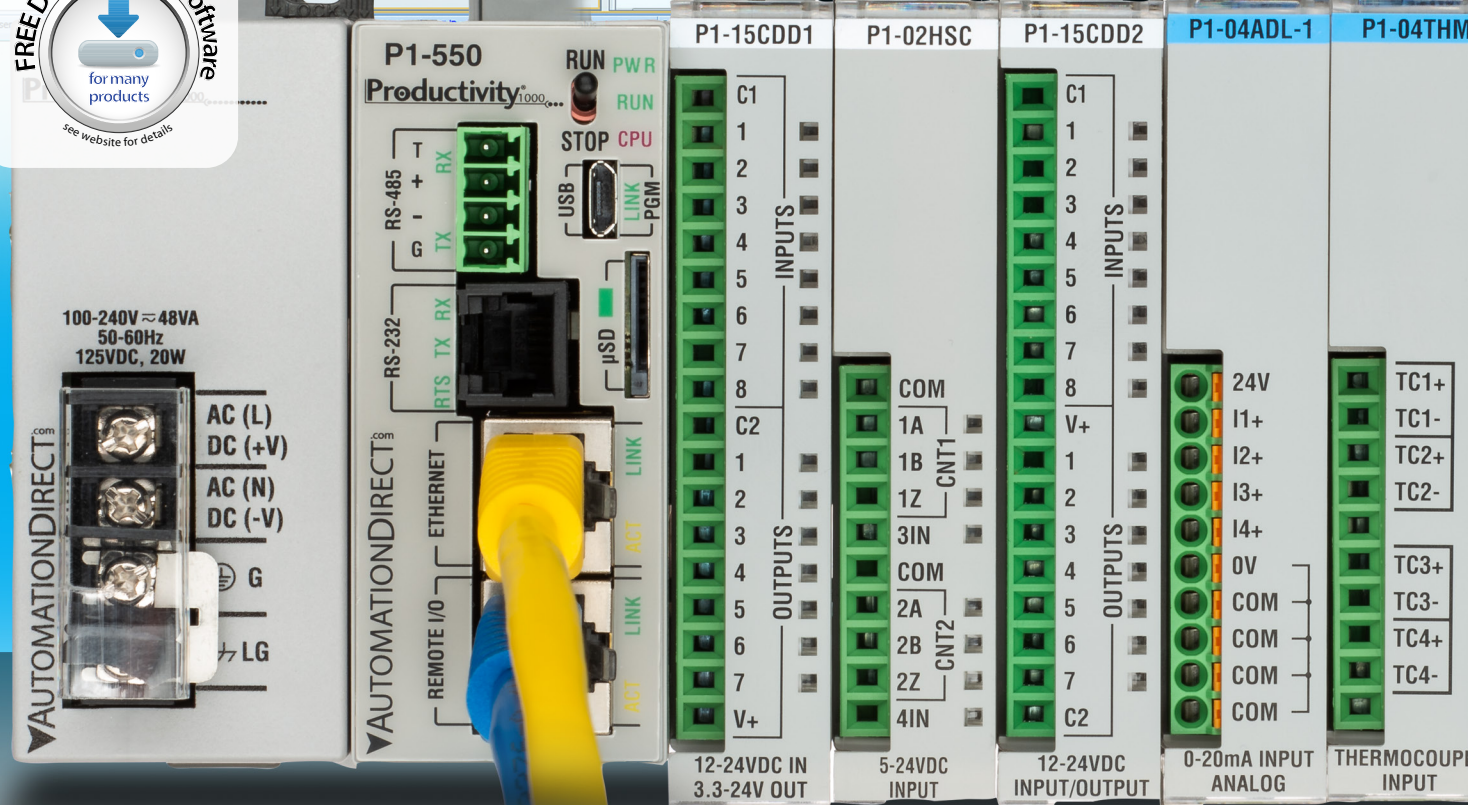
www.automationdirect.com/Productivity1000

Need a compact PLC with powerful features?

The Productivity1000 series PLC is the super compact yet highly capable member of our Productivity controller family. Packed with many of the features you love about the Productivity series but housed in a smaller, slimmer design and with a CPU price starting at $237.00, the Productivity1000 PLC will deliver the time, space, and budget savings your project needs.

Productivity®1000

Data Logging:
The Productivity1000 allows for up to 32GB of historical data to be saved to a removable micro SD card (sold separately).
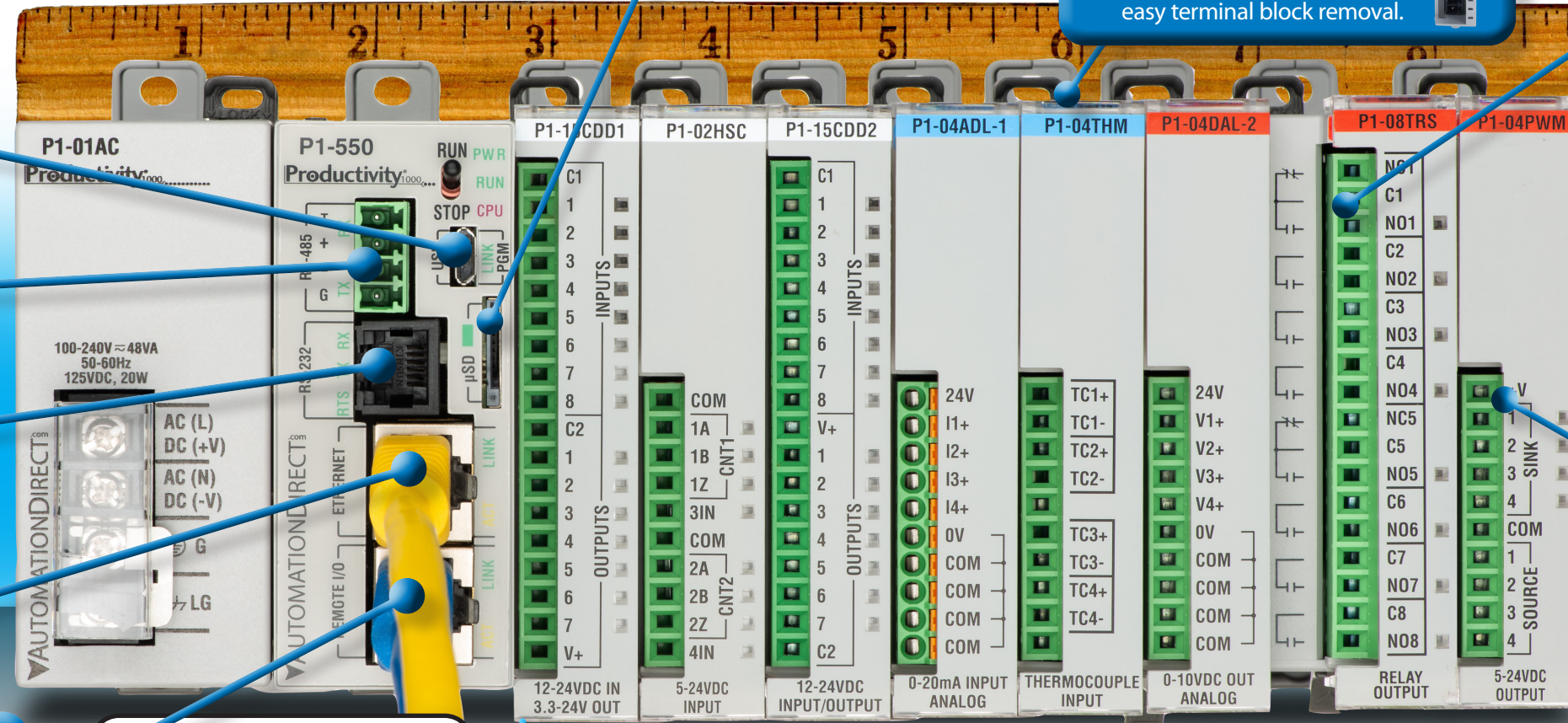
micro SD

Built-in Accessibility:
- The single top-side latch on every I/O module provides free and clear access to the latching mechanism when adding/removing I/O modules.
- The pivoting wire cover on each I/O module displays the wire label in any position so it's visible at all times.
- A fulcrum lever is designed into every I/O module for easy terminal block removal.

Slim Stackable Design:
The super slim form factor requires minimal panel space (approximately 8.9" for a 8 module system) and the stackable design allows for simple I/O expansion.

Built-in Communication:
The Productivity1000 comes with up to 5 built-in communication ports for easy connectivity to your PC or various industrial networks.

Micro USB
MicroB USB port for easy plug-and-play programming

Serial RS-485
4-pin serial Modbus RTU/ASCII or custom protocol connection

Serial RS-232
RJ12 serial Modbus RTU/ASCII or custom protocol connection

Ethernet 10/100Mbps
RJ45 Ethernet port for PLC programming and/or Modbus TCP, EtherNet/IP, MQTT, custom UDP/TCP connections

Ethernet 10/100Mbps Remote I/O
RJ45 Ethernet port for easy GS series variable frequency drive, PS-AMC motion controller, Protos X field I/O, and P1000 remote I/O (P1-RX) connections **(P1-550 ONLY)**

CPU STARTING AT $237.00

EtherNet/IP   Modbus®   ≋MQTT   ASCII

Multiple Wiring Options:
Choose from spring clamp, screw terminal or the popular ZipLink wiring solution for your I/O wiring needs.

Spring Clamp

Screw Terminal
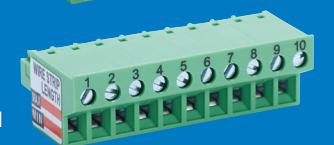
ZIPLINK ▼AutomationDirect.com

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

ZIPLink

A variety of input, output, specialty, and combination I/O modules available

Need more I/O?
Add an additional 512 discrete or 256 analog I/O points using the P1-RX remote expansion module (up to 4 remote I/O bases w/ 8 I/O modules each)

2 YEAR WARRANTY

45-day Money-Back Guarantee 45 day

FREE Technical Support Located in USA

Productivity Series Engineered in USA

I/O EXPANSION MODULES STARTING AT $48.50

Local I/O Expansion:
You can stack up to 15 I/O modules onto the Productivity1000 CPU when using the P1-02AC power supply for a total of up to 240 local discrete I/O points or 120 local analog I/O channels. I/O expansion modules support:
- Discrete
- Analog
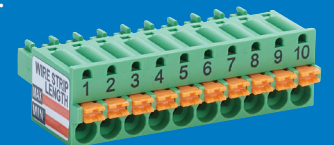- Temperature
- Relay
- High Speed
- PWM

Reliable, affordable, super-compact hardware

The Productivity1000 series PLCs hardware is built to last and designed for applications where panel real estate is a concern. With various low-cost expansion I/O modules to choose from and feature-rich CPUs all backed with a 2-year warranty and a 30-day money-back guarantee, you'll never pay for overpriced hardware again!
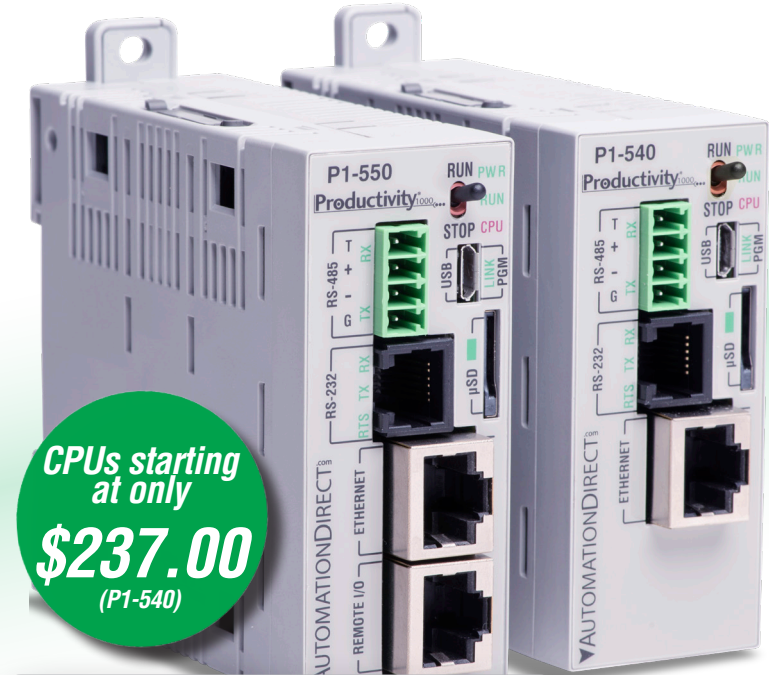
CPU Comparison	AutomationDirect P1-540	AutomationDirect P1-550
Total Memory	50MB	50MB
Built-in USB Programming Port	✔	✔
Built-in Serial Ports (RS-232 & RS-485)	2	2
Built-in Ethernet Ports (RJ45)	1	2
EtherNet/IP, MQTT, Modbus RTU/TCP Protocols	✔	✔
Remote Expansion Support	---	✔
Max Local I/O Capacity	240	240
Max Expansion I/O Capacity	---	512
PS-AMC support - Coordinated Motion	---	✔
Integrated GS Drive/ Protos X Field I/O Support	---	✔
Data Port (data logging)	✔	✔
Price	$237.00	$268.00

CPUs starting at only
$237.00
(P1-540)

Starting at
$52.00
(P1-01AC)

Full-featured CPUs

With 50MB of user memory, up to five built-in communication ports, data logging and tag name programming, these CPUs offer big features in a small package.

- Plug-and-play USB programming (uses standard A-micro B cable)
- Tag database and program documentation storage in CPU (program pre-loaded on PC not necessary)
- Supports up to five built-in communications ports simultaneously
- High-speed Ethernet port for HMI and peer-to-peer or business system networking (no Ethernet communications module needed)
- Support for Modbus, EtherNet/IP, and MQTT connections
- Two serial ports for peripheral device interface or controller networking
- Micro SD data logging right from the CPU
- Remote I/O port (P1-550 only) for up to 16 GS series drive connections, 1 PS-AMC motion controller, or hundreds of additional remote I/O points using the P1-RX remote expansion module and/or the Protos X field I/O system

Priced at
$99.00
(P1-RX)

P1-550 CPU

Remote I/O Expansion Module

The P1-RX module adds remote I/O capability to the P1-550 CPU, providing up to 512 remote I/O points (4 remote bases with 8 modules each).

- P1-RX - Productivity1000 remote I/O module, (1) Ethernet (RJ45) port for use with P1-550 CPU
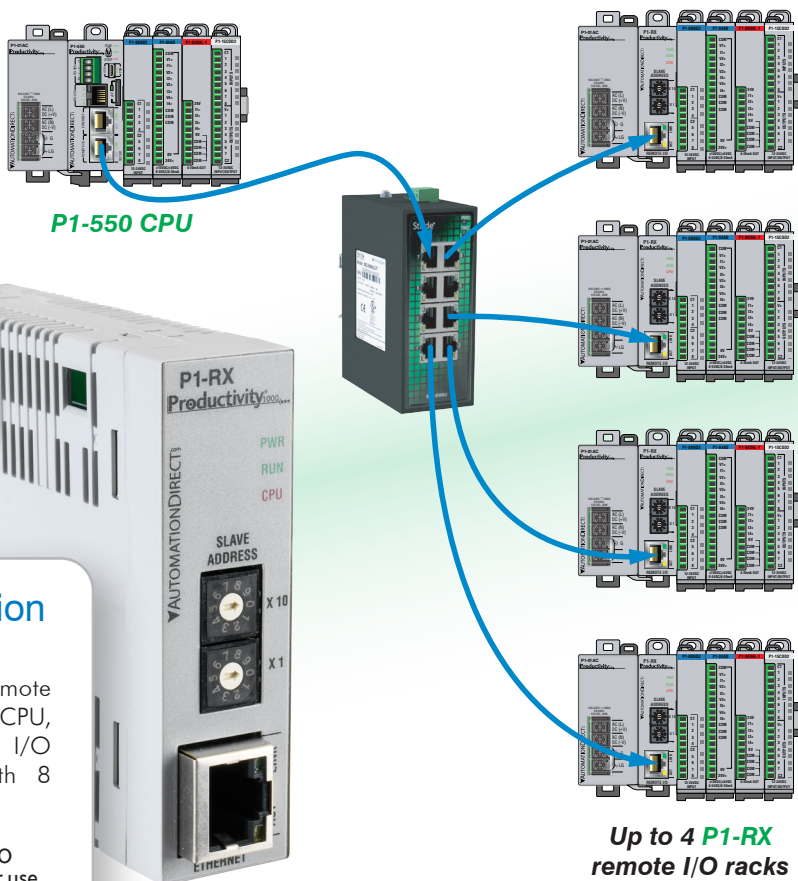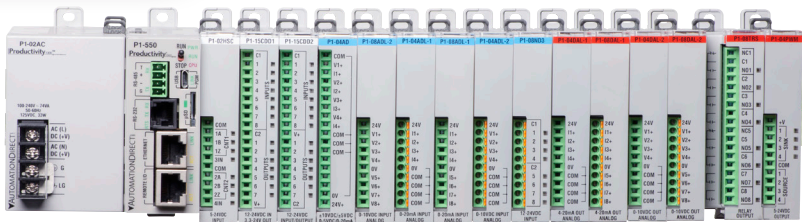
Up to 4 P1-RX remote I/O racks

Power Supplies

Productivity1000 power supplies provide 16 or 26 W of output power with VDC or VAC input options.

- P1-01DC - 12-24 VDC input with 24VDC, 0.67 A, 16W output. Use with up to 8 local I/O expansion modules
- P1-01AC - 100-240 VAC or 125VDC input with 24VDC, 0.67 A, 16W output. Use with up to 8 local I/O expansion modules
- P1-02AC - 100-240 VAC or 125VDC input with 24VDC, 1.08 A, 26W output. Use with up to 15 local I/O expansion modules

P1-01AC or P1-01DC power supplies support up to 8 local I/O expansion modules

P1-02AC power supply supports up to 15 local I/O expansion modules

For the latest prices, please check AutomationDirect.com.   For the latest prices, please check AutomationDirect.com.

AUTOMATIONDIRECT

45-day Money-Back Guarantee
45 day

2 YEAR WARRANTY

Discrete I/O Modules

Discrete input, output and combo input/output modules are available in 8 or 16-point versions with various DC/AC voltage ranges.

- P1-08ND-TTL - Input Module 8-pt, 3.3-5 VDC
- P1-08ND3 - Input Module 8-pt, 12-24 VDC
- P1-08NE3 - Input Module 8-pt, 24 VAC/VDC VDC
- P1-08NA - Input Module: 8-pt, 120-240 VAC
- P1-16ND3 - Input Module: 16-pt, 12-24 VDC
- P1-16NE3 - Input Module: 16-pt, 24 VAC/VDC
- P1-08TD-TTL - Output Module 8-pt, 5 VDC
- P1-08TD1 - Output Module 8-pt, 3.3-24 VDC
- P1-08TD2 - Output Module 8-pt, 12-24 VDC
- P1-08TA - Output Module: 8-pt, 120-240 VAC
- P1-15TD1 - Output Module: 15-pt, 3.3-24 VDC
- P1-15TD2 - Output Module: 15-pt, 12-24 VDC
- P1-15CDD1 - Combo Module 8-pt 12-24 VDC in, 7-pt 3.3-24 VDC out
- P1-15CDD2 - Combo Module 8-pt 12-24 VDC in, 7-pt 12-24 VDC out

Starting at $47.50 (P1-08TD2)

DISCRETE I/O

Analog/Temperature I/O Modules

Analog input and output modules are available to monitor and control pressure, temperature, flow, level or any other process signal your application requires.

- P1-04AD - Input Module 4-channel, ±5VDC, ±10VDC, 0-5 VDC, 0-10 VDC and 0-20 mA, 16-bit resolution
- P1-04AD-1 - Input Module, 4-channel, 0-20 mA, 16-bit resolution
- P1-04AD-2 - Input Module, 4-channel, 0-10 VDC, 16-bit resolution
- P1-04ADL-1 - Input Module 4-channel, 0-20 mA, 13-bit resolution
- P1-04ADL-2 - Input Module 4-channel, 0-10 VDC, 13-bit resolution
- P1-08ADL-1 - Input Module 8-channel, 0-20 mA, 13-bit resolution
- P1-08ADL-2 - Input Module 8-channel, 0-10 VDC, 13-bit resolution
- P1-04DAL-1 - Output Module 4-channel, 4-20 mA, 12-bit resolution
- P1-04DAL-2 - Output Module 4-channel, 0-10 VDC, 12-bit resolution
- P1-4ADL2DAL-1 - Combo Module 4-channel 0-20 mA in, 2-channel 4-20 mA out
- P1-4ADL2DAL-2 - Combo Module 4-channel 0-10 VDC in, 2-channel 0-10 VDC out
- P1-08DAL-1 - Output Module 8-channel, 4-20 mA, 12-bit resolution
- P1-08DAL-2 - Output Module 8-channel, 0-10 VDC, 12-bit resolution
- P1-04THM - Thermocouple Input Module 4-channel, 16-bit resolution
- P1-04NTC - Thermistor Input Module 4-channel, 16-bit resolution
- P1-04RTD - RTD Input Module, 4-channel, 16-bit resolution

Starting at $95.00 (P1-04ADL-1)

## ANALOG I/O

Relay I/O Modules

Relay output modules support devices that operate with voltages up to 264 VAC or 30 VDC.

- P1-04TRS - Output Module 4-pt, 5-30 VDC/5-264 VAC, 7A/pt
- P1-08TRS - Output Module 8-pt, 6-24 VDC/6-120 VAC, 3A/pt
- P1-16TR - Output Module 16-pt, 6-24 VDC/6-240 VAC, 2A/pt
- P1-16CDR - Combo Module 8-pt discrete 24 VAC/VDC in, 8-pt 6-24 VDC/6-240 VAC relay out, 1A/pt

Starting at $61.00 (P1-08TRS)

RELAY I/O

Specialty I/O Modules

Specialty modules are designed to perform specific functions, including input simulation, which differ from the typical functions of input/output modules.

- P1-08SIM - Input Simulator Module, 8-pt
- P1-02HSC - High-speed Counter Module, 2) 100kHz counter inputs, 2) 5-24 VDC general purpose inputs
- P1-04PWM - Pulse Width Modulation Output Module, 4) 0-20 kHz pulse modulated outputs, 0-100% duty cycle

Starting at $52.00 (P1-08SIM)

SPECIALTY I/O

PS-AMC Enhanced Motion Controller

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 (1 module per P1-550 CPU).

- PS-AMC: Motion controller with up to 4 axes, 1 MHz maximum switching frequency, up to 24 high-speed input points, 4 differential encoder inputs, 12 high-speed output points, and 4 differential outputs.
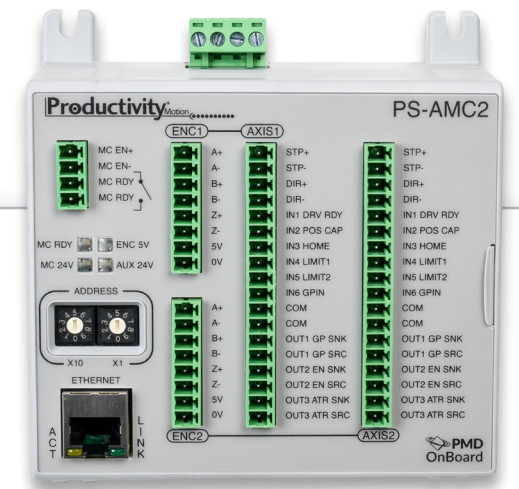
We make PLC communication practical

Two serial ports included on CPU

Two serial ports are included on the Productivity1000 CPUs for communication to peripheral devices:

(1) RJ12 (6P6C) port for RS-232 devices

(1) 4-wire screw terminal for RS-485 multi-drop devices

These ports provide Modbus RTU Master/Slave capability, ASCII In and Out capability and Custom Protocol over Serial capability. The RS-485 port can support up to 50 multi-drop devices (more if repeater is added to network).

www.Productivity1000.com

Productivity®1000

ETHERNET **ETHERNET REMOTE I/O** (P1-550 ONLY) **USB** **RS-232** **RS-485**

Built-in Ethernet on the CPU has got you covered!

Both Productivity1000 CPUs come standard with a general purpose Ethernet port and two of the top industrial Ethernet protocols in our market. Modbus TCP and EtherNet/IP are a must for any up-to-date networked control system. MQTT is also supported which is fast becoming an industry requirement as the IIoT and machine-to-cloud connections become more and more prevelant.

Ethernet ports:

10/100Mbps multipurpose Ethernet port for programming, monitoring, firmware upgrades and a mixture of the following client/server connections:

- 16 Modbus TCP Client connections (CPU Master)
- 16 Modbus TCP Server connections (CPU Slave)
- 32 EtherNet/IP Scanners (CPU Master)
- 4 EtherNet/IP Adapters (CPU Slave)
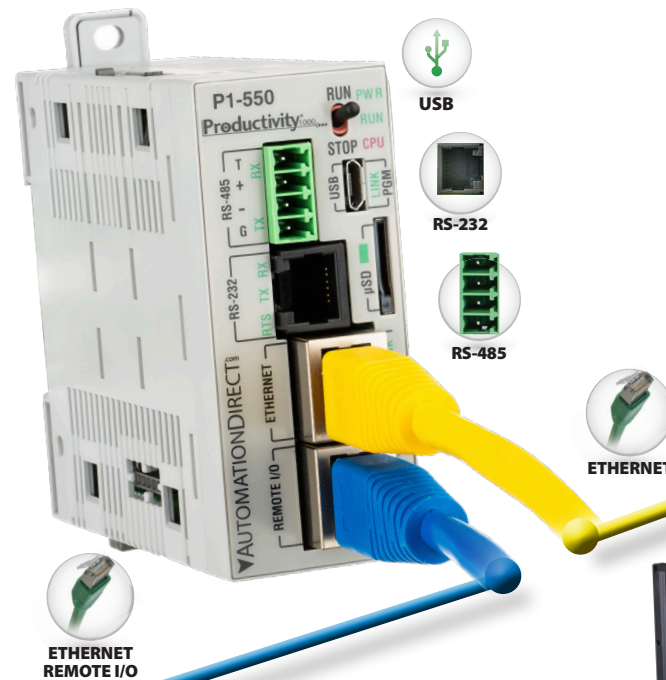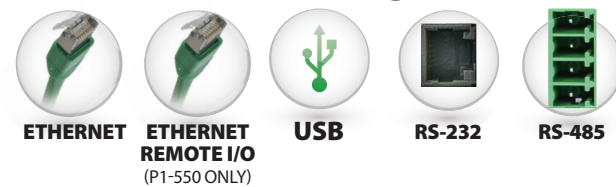- 4 cloud connections using MQTT

A total of 128 EtherNet/IP connections and over 5000 EtherNet/IP messages per second! And unlike many controllers, the Productivity series CPUs support both Explicit and Implicit (I/O) messaging for greater functionality.

The Productivity1000 also provides a Custom Protocol over Ethernet (CPE) option which gives the user the ability to create their own communications protocol between the Productivity series CPU and a 3rd party Ethernet device via TCP or UDP.

The ProNET feature is also available and allows any P-series CPU to seamlessly share data by publishing to or subscribing to data from other P-series CPUs. Up to 32 publishers and/or subscribers are allowed per CPU.

2 YEAR WARRANTY

P1-550
Productivity1000

USB
RS-232
RS-485
ETHERNET
ETHERNET REMOTE I/O

GS20 with optional Ethernet module

P1-550 only: Remote I/O, 10/100Mbps Ethernet port (bottom) supports up to 16 GS series variable frequency drive connections, 1 PS-AMC controller, 4 Protos X field I/O racks and/or 4 P1-RX remote I/O expansion racks.

GS Drive, PS-AMC and Protos X field I/O configurations are easily modified within ProductivitySuite and saved with the PLC project.
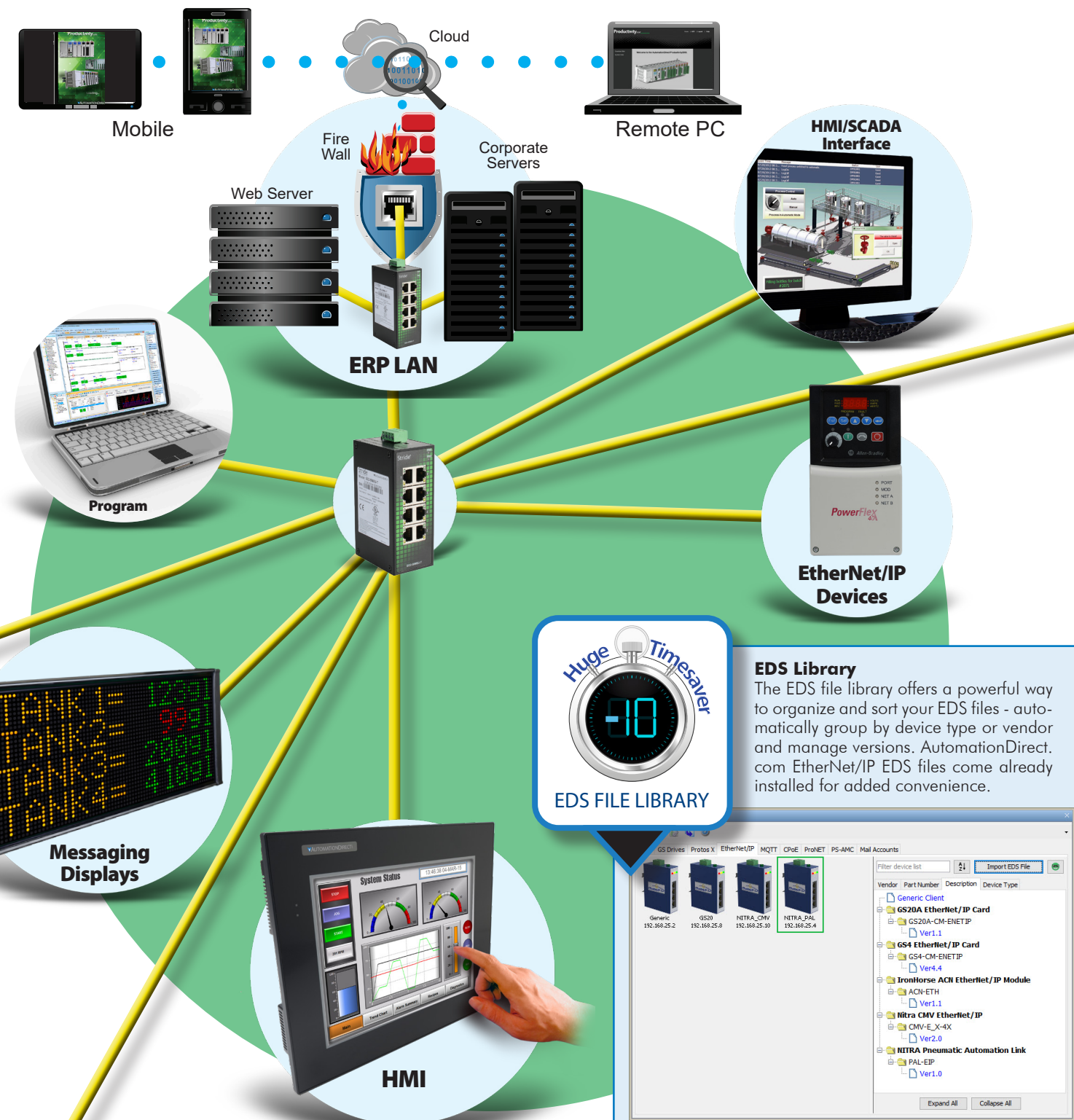
EtherNet/IP

Productivity Suite makes communicating with EtherNet/IP devices a snap.

- Scanner and adapter supported
- Implicit application types supported include input-only and listen-only
- EDS file configuration presented in an easy-to-use drop-down menu
- Ability to select multiple connection options from an EDS file which simplifies configuration
- The EDS file library offers an easy way to upload, store, and manage your EDS files
- AutomationDirect.com EtherNet/IP EDS files are preloaded in the library for convenience

ProductivitySeries
EtherNet/IP
Overview and Intro

Click the link above for a collection of videos on using EtherNet/IP with Productivity PLCs

Cloud

Mobile

Remote PC

Fire Wall

Corporate Servers

HMI/SCADA Interface

Web Server

ERP LAN

Program

EtherNet/IP Devices

Messaging Displays

Huge Timesaver
-10
EDS FILE LIBRARY

EDS Library
The EDS file library offers a powerful way to organize and sort your EDS files - automatically group by device type or vendor and manage versions. AutomationDirect.com EtherNet/IP EDS files come already installed for added convenience.

HMI

For the latest prices, please check AutomationDirect.com.　　　For the latest prices, please check AutomationDirect.com.

AUTOMATIONDIRECT.com
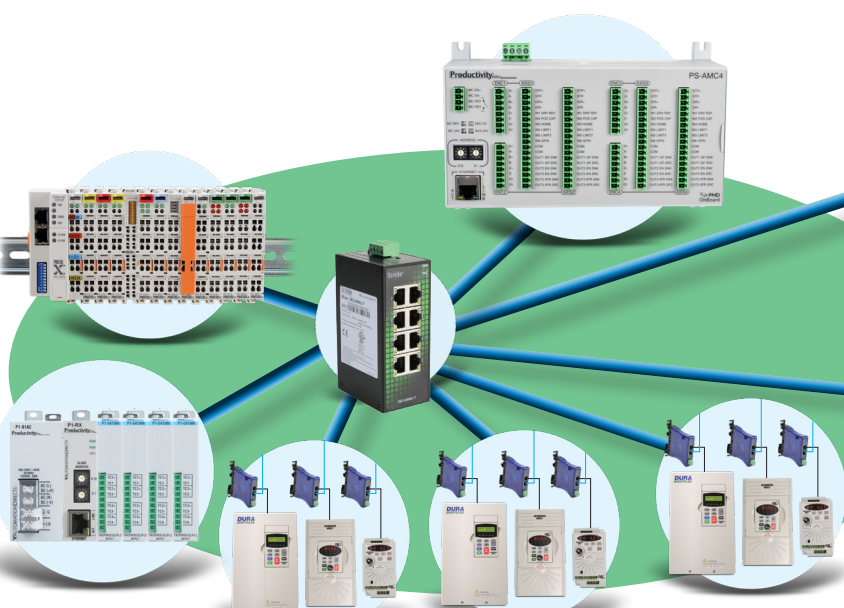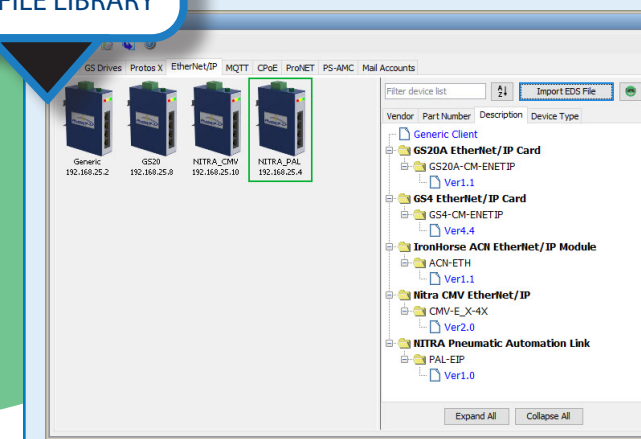
We make cloud communication easy

Industrial machines/systems are more connected than ever before, whether internally with upstream IT management systems or externally with remote support personnel, modern-day 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.
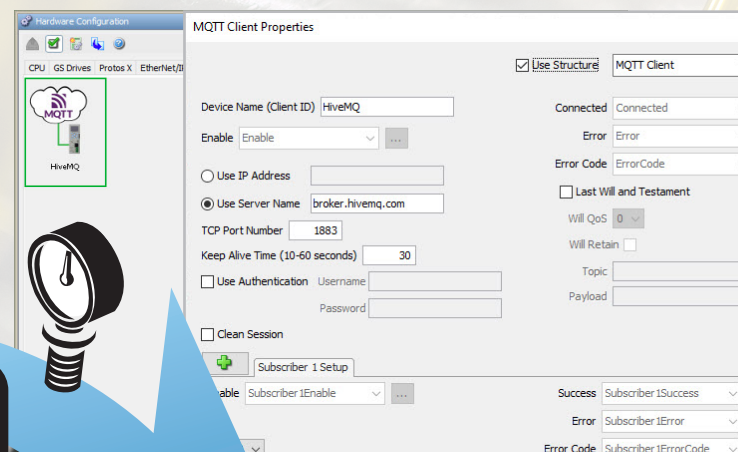
But how does data from a simple level switch on a tank get to the cloud? With Productivity PLCs, it easy! Productivity PLCs have the communication capabilities and processing power needed to not only control plant-floor machines but gather valuable data from them, package it, and send it on to higher 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, Productivity1000 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.

IIoT/Cloud platforms

Compatible with MQTT brokers and cloud platforms/services including:

- IBM Watson®
- Mosquitto®
- HiveMQ®
- Thingsboard®

3rd party cloud dashboards

MQTT.ORG

The MQTT protocol has become the frontrunner for many machine-to-machine (M2M) and IIoT/cloud networking applications, due to its lightweight overhead and reduced bandwidth consumption. Productivity PLCs support MQTT communication and with fill-in-the-blank MQTT messaging configurations, delivering vital data to advanced cloud computing platforms is easy.

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-to-use 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 score, a rejection percentage, or any other metric that's vital to you.

PLC DATABASE

- PRODUCTION RUN TIME
- TOTAL JAR COUNT
- SUPPLY CONSUMPTION RATE
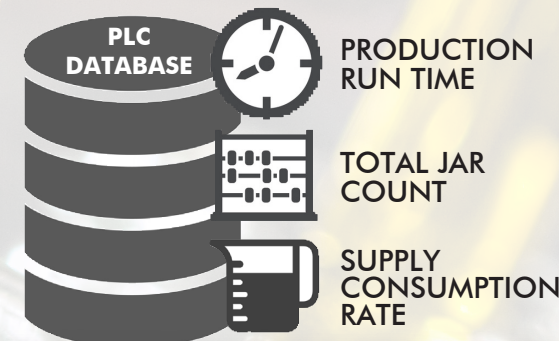
RAW SYSTEM DATA

INDUSTRY 4.0 IIoT
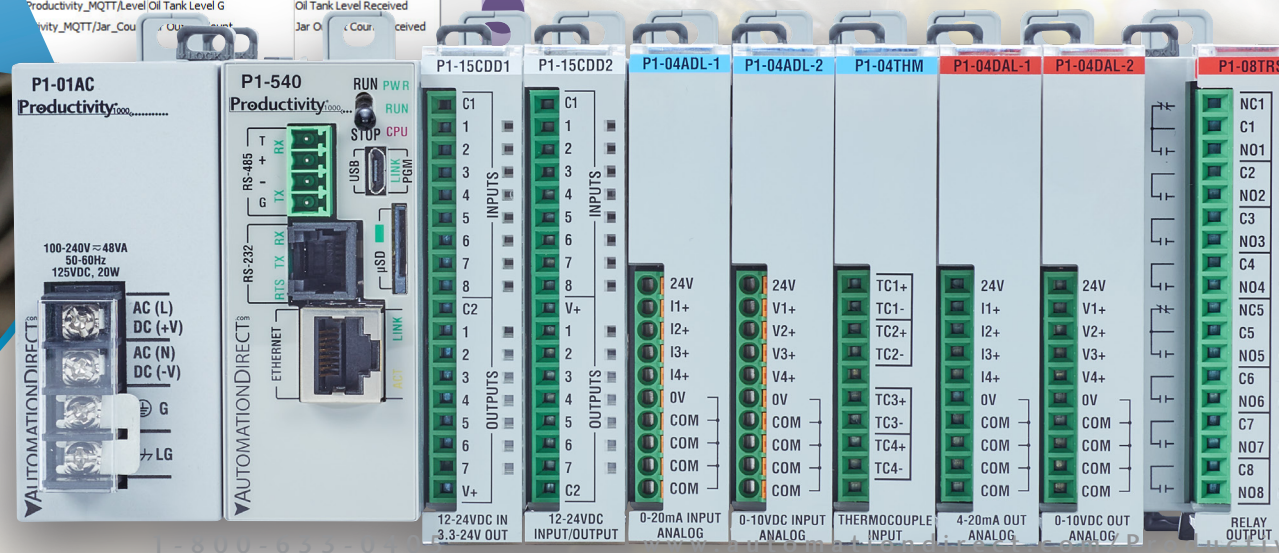
Productivity built in

There are many features integrated into the Productivity1000 series PLCs and tools on our webstore that provide unmatched ease of use when selecting, expanding, configuring and wiring your hardware.

Expansion is a snap

The Productivity1000 requires no base or backplane and can easily be expanded with up to 15 snap-on I/O modules. The local P1000 system can support up to 240 discrete I/O points or 120 analog I/O channels total. The I/O modules can be easily added or removed using the single latch mechanism on the topside of each module. This stackable design allows you to purchase only the I/O required for your particular application.

This versatility also means you can use the Productivity1000 CPU as a stand alone, low-cost data logger or protocol converter (no I/O modules).

Get started in seconds with auto-discovered I/O modules

Once an I/O module is installed, in either the local or one of 4 remote racks, the P1000 will automatically discover the module and create a realistic picture of your configuration in the free Productivity Suite software. Physical I/O tags will be generated based on each module's position in their rack and that's it! You are ready to program with the auto-configured settings just seconds after power-up, or you can reconfigure the setup and assign new tags manually.

Support information at your fingertips!

All Productivity1000 I/O modules have QR codes printed on the underside of their wire covers. Scan the code with your smart phone or tablet QR app to get the latest specifications/ wiring diagrams for that module.

Integrated Protos X field I/O

The Productivity Suite software will auto detect the Protos X field I/O system (using a Modbus coupler) connected to the Remote I/O port of the P1-550 and automatically assign tags to the installed I/O terminals. The configuration can be manually changed and it is saved within the PLC project.

VFDs configured with ease!

The Productivity Suite software is designed to recognize any AutomationDirect GS series drive. Simply connect the drive to the Remote I/O port of the P1-550 CPU and it is discovered in the Productivity Suite software. No more searching through drive manuals to find the parameter you need, each parameter, with description, range, and value, is available in the software.
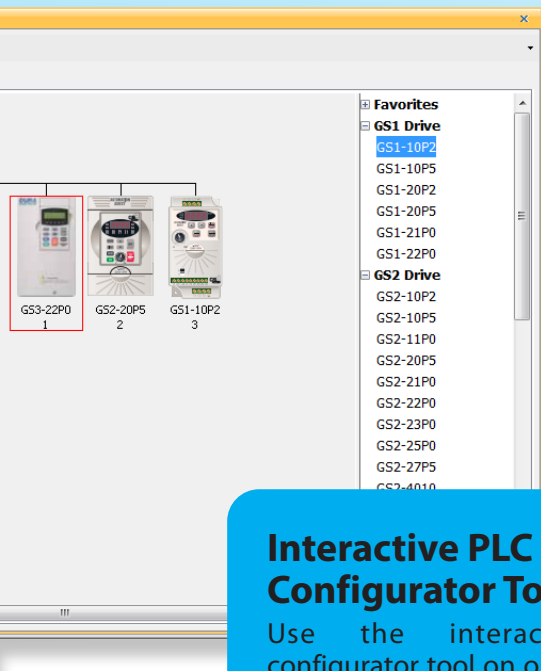
Interactive PLC Configurator Tool

Use the interactive PLC configurator tool on our webstore to quickly configure your Productivity1000 system to your specifications. Simply choose the CPU and I/O modules you require with the connection options you prefer and send the selected parts right to the shopping cart.
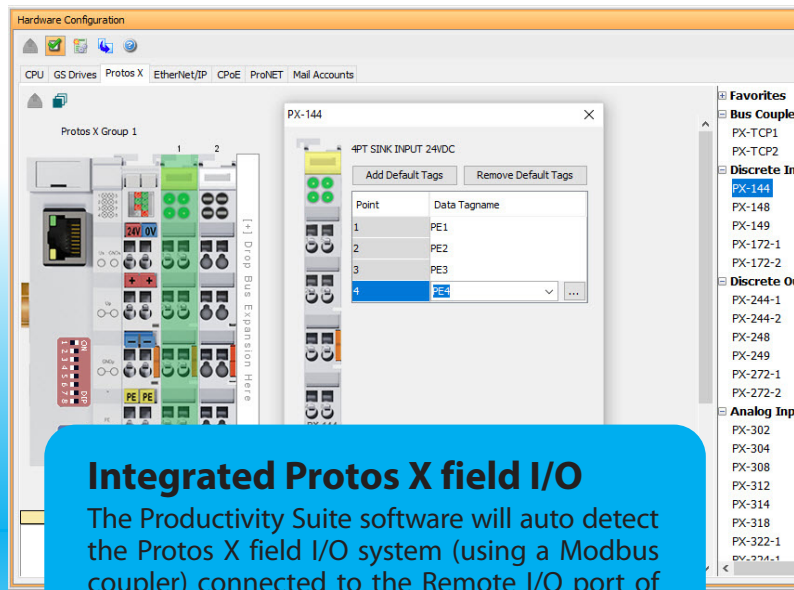
See how easy it is at:

Click here to go now!

BIG PLC features in a small package for a tiny price

The Productivity1000 series PLCs are designed with features you'd expect to pay a whole lot more for. Built-in data logging, tag name programming, limitless PID, web server and mobile access, plus many other advanced features are packed into this budget and space-saving PLC series.

Up to 32GB of data!

micro SD

Built-in Data Logging

Track up to 64 tags at a time and save the data to the removable micro SD card stored in the CPU. Capture up to 32GB of data either periodically (minute, hour, day, week, etc.) or when certain events occur. Scheduling and setup is done with the easy-to-use Data Logger configuration tool in the software. Log tag data, system errors and system events which can be used to track efficiency and performance, troubleshoot recurring or intermittent faults, and predict future breakdowns.

CPU starting at $237.00 (P1-540)

No-Limit PID

With 50MB of user memory, you have practically limitless PID functionality. The integrated PID function blocks make it easier to configure and control the process loops in your application.

The PID Monitor utility allows you to monitor your loops and tune them in real time. We also offer a built-in Auto-tuning algorithm (Ziegler-Nichols) to help give you a jump on fine tuning your loops.

The PID instruction supports either individual or cascade mode operation. It also includes a tab for configuring all of your process alarms, including Low-Low, Low, High, High-High Limits and Deviation Alarms.

Web Server

With the P1000 CPU's integrated Web Server, you can access Data Logger files stored on an installed flash device (optional) as well as monitor system status via the (read-only) System Tags.

Apple iOS PACDATA app

The FREE PAC/PLC Data Remote Monitor App allows you to connect to remote P1000 systems from a Wi-Fi or cellular network connection. The Remote user can monitor the local PLC system and user tags configured for remote access inside the tag database of the controller.

Timesaving Tag Names!

Export your tag name database from the Productivity1000 and import it into C-more software to jump start your HMI development. No more digging through your notes, or hunting through your ladder logic to find the right tag name.

Connect up to 16 C-more HMIs to the Productivity1000 via Ethernet for control and visibility of your process/machine from anywhere in your factory.

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 in any application.

Drawings are for illustrative purposes only.

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 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!

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 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

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

Axis Definitions

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

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.

ProductivityMotion

Axis3

Axis2

Axis1

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.

PS-AMC4
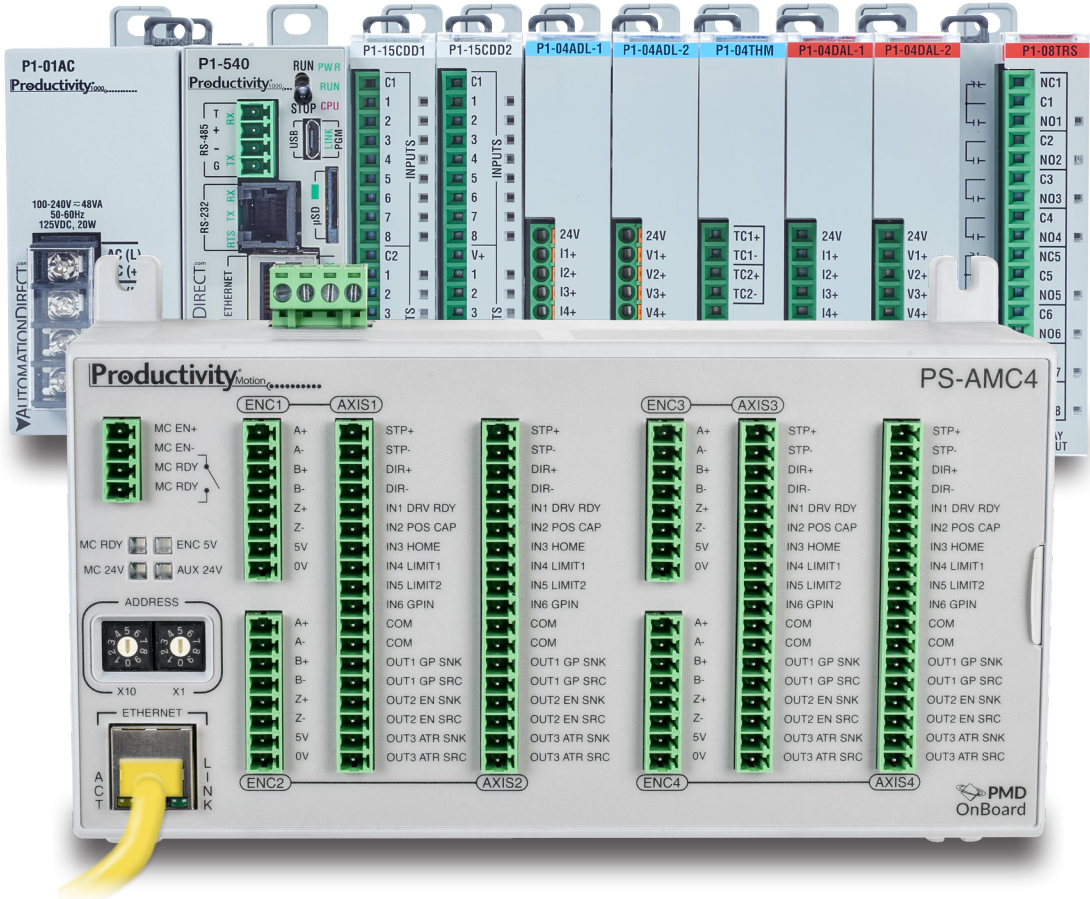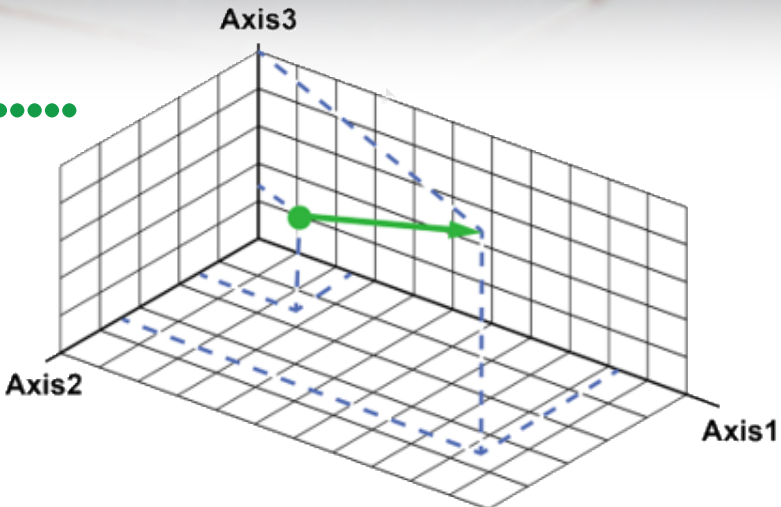
Precise positioning for when close enough just won't cut it

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

On-the-fly position corrections with a single instruction

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.
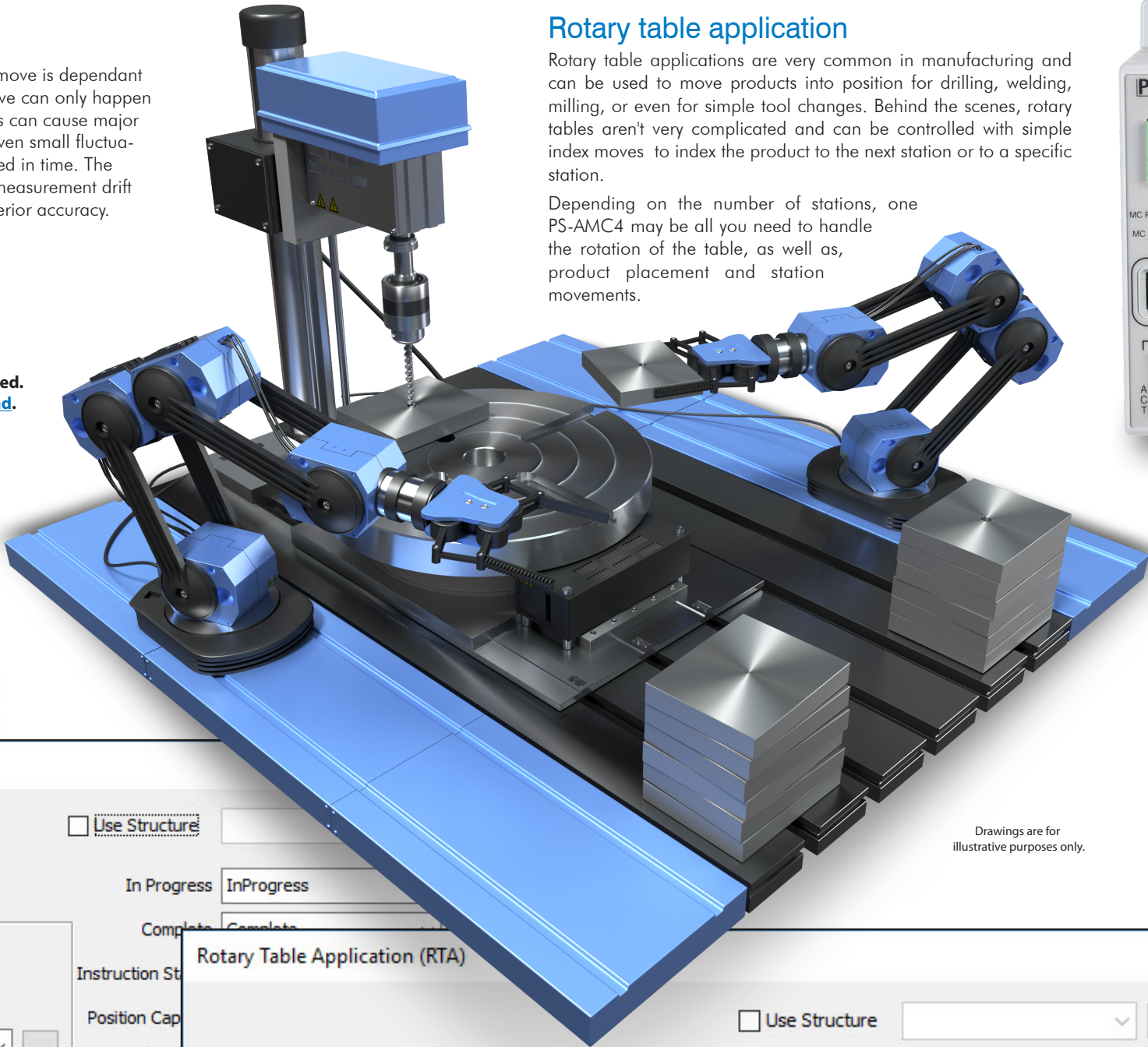
Drawings are for illustrative purposes only.

Productivity Motion
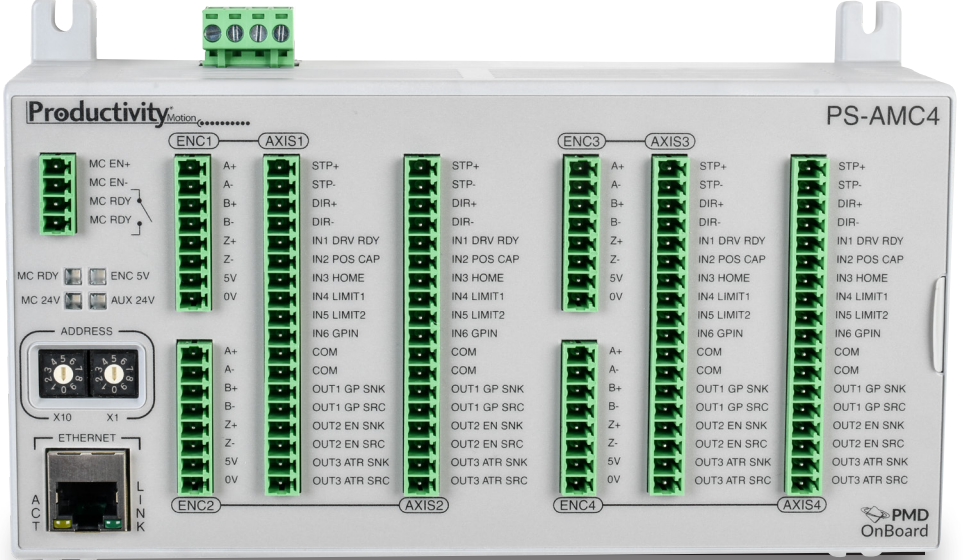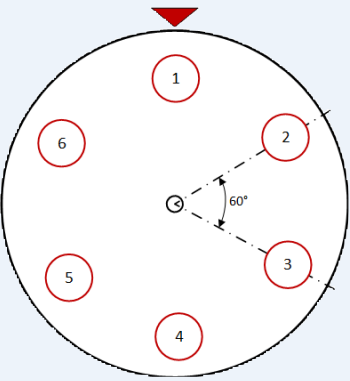
PS-AMC4

PS-AMC4
$542.00
4 AXES

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
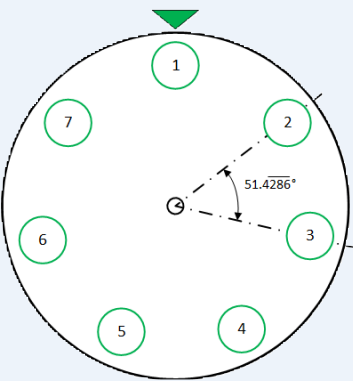
6-station rotary table with non-fractional measurements

$51.4\overline{286}°$

$60°$

Manual Registration (MREG)

☐ Use Structure

Module Name: AMC-1 ▾

In Progress   InProgress

Complete   Complete

Instruction St

Position Cap

Last Correc

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

Rotary Table Application (RTA)

☐ Use Structure

Axis Name: AMC-1-AXIS-1 ▾   In Progress InProgress ▾
Module Name: AMC-1   Axis: 1   Complete Complete ▾
        Current Station CurrentStation ▾
        Instruction Status Status ▾

Abs Move Direction Always Move Forward ▾

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

Productivity Suite

▼AutomationDirect.com

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

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!
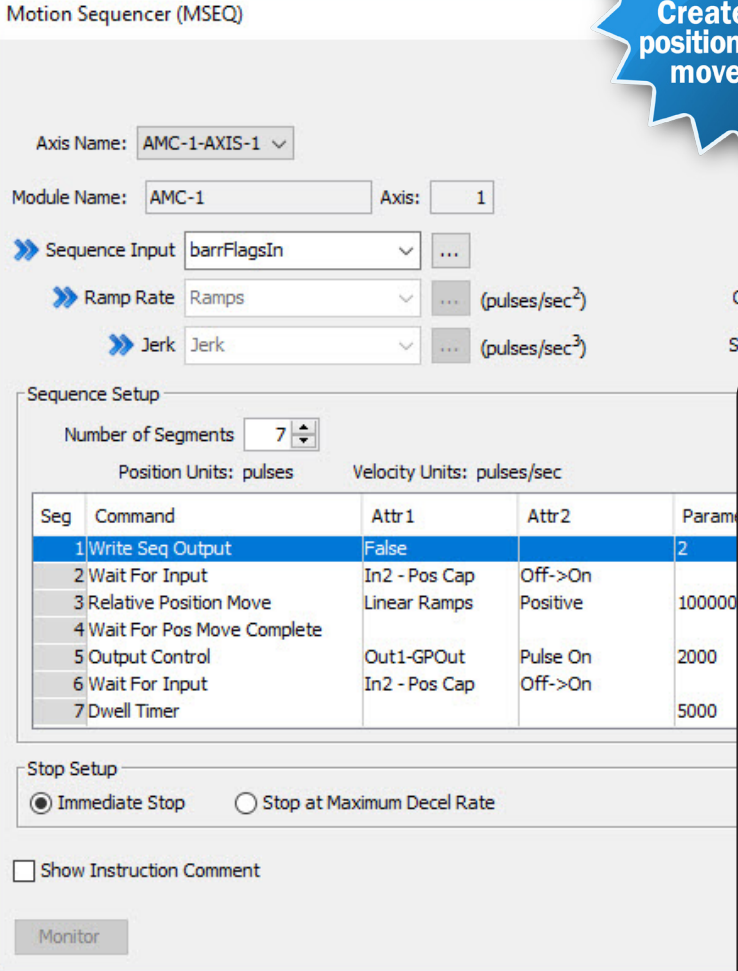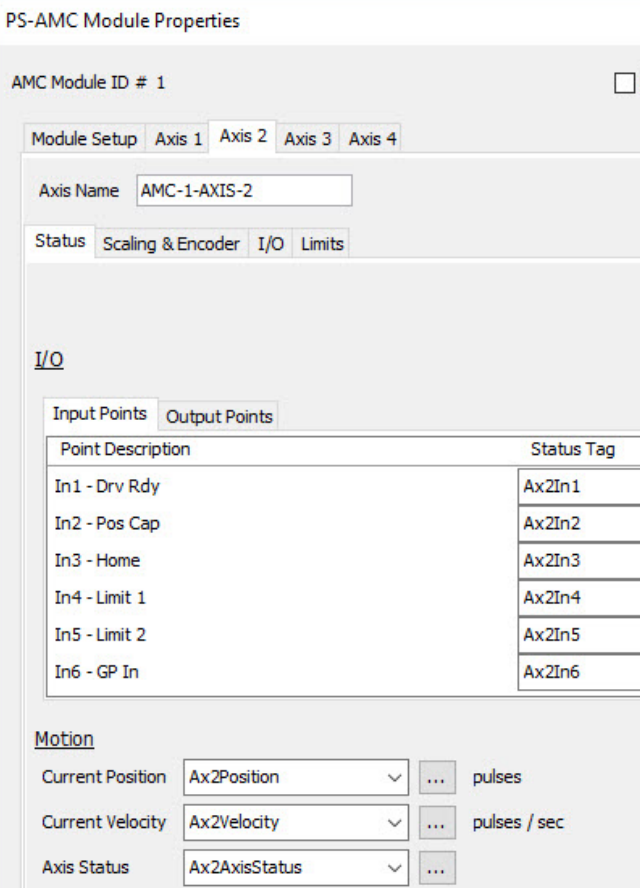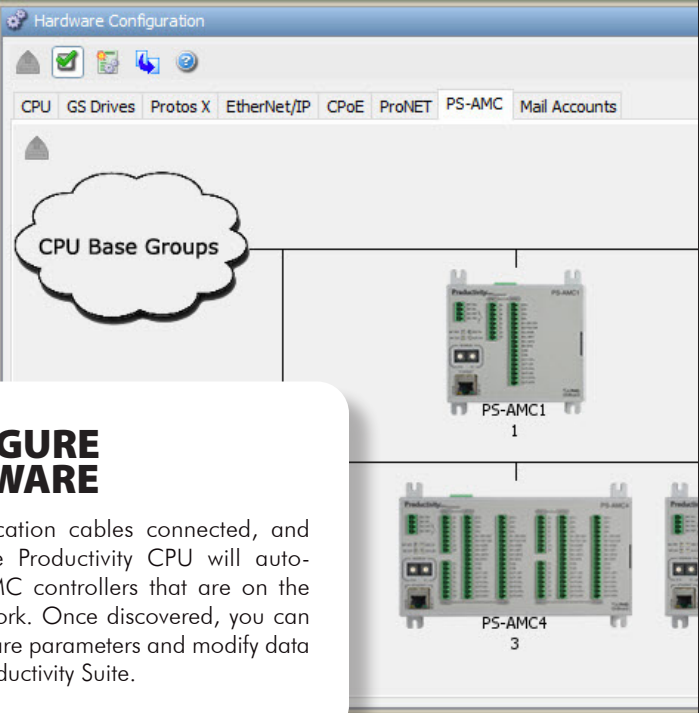
BUILD YOUR OWN!
Create custom position & velocity move profiles

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

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

Hardware Configuration

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

CPU Base Groups

PS-AMC1
1

PS-AMC4
3

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.

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)

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	Attr2	Param
1	Write Seq Output	False		2
2	Wait For Input	In2 - Pos Cap	Off->On	
3	Relative Position Move	Linear Ramps	Positive	100000
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

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
- WebFilm handling
- Boring/drilling/tapping
- Coil winding
- Wrapping
- Thermo-formers
- Rotary knives
- And many more...

mP1-22 Productivity Series PLCs
11_17

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Productivity Series PLCs mP1-23
11_17

For the latest prices, please check AutomationDirect.com.   For the latest prices, please check AutomationDirect.com.

AUTOMATIONDIRECT

Get the control you need for less with Productivity

Productivity1000 PLCs have low-cost specialty modules to tackle specific functions that are beyond the realm of standard I/O modules. High-speed input counting and pulse width modulated outputs are capabilities provided by these modules for applications that require a little more than generic I/O.
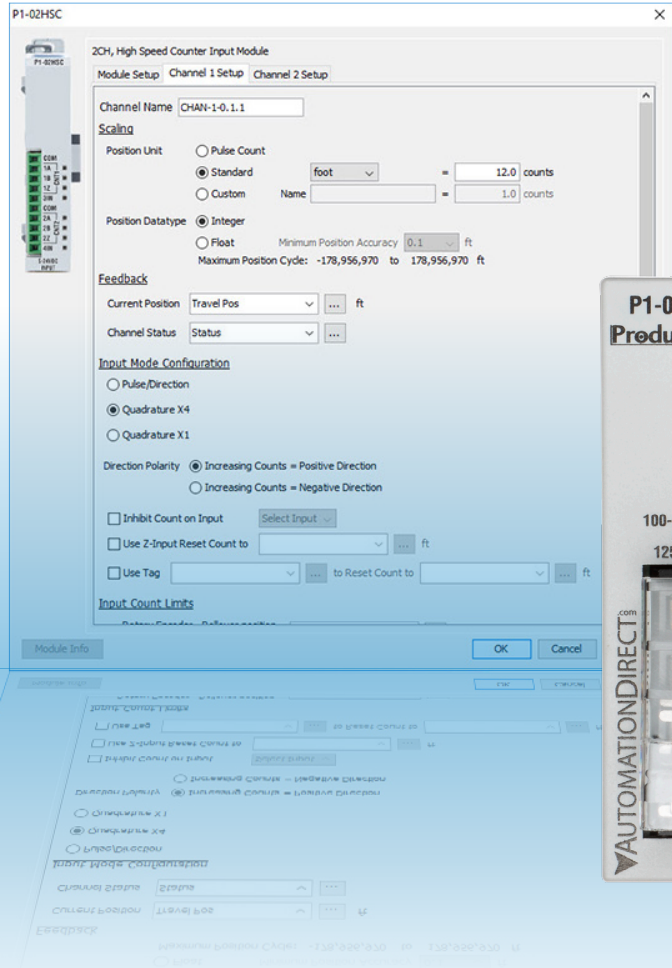
Setup is a cinch!

ProductivitySuite makes it easy to configure your specialty modules. Simply use the convenient fill-in-the-blank GUI to pick the functions you desire, set the scaling (standard or custom), assign the appropriate tags or create them on the fly, it couldn't be any easier.

High-speed Counter (HSC)

The P1-02HSC is capable of handling input pulse frequencies up to 100kHz. Easily count and/or calculate pulse rates from dedicated inputs or encoder signals that are used in many applications including package tracking and picking systems. Additionally, there are two general purpose inputs for use as 5-24 VDC inputs.
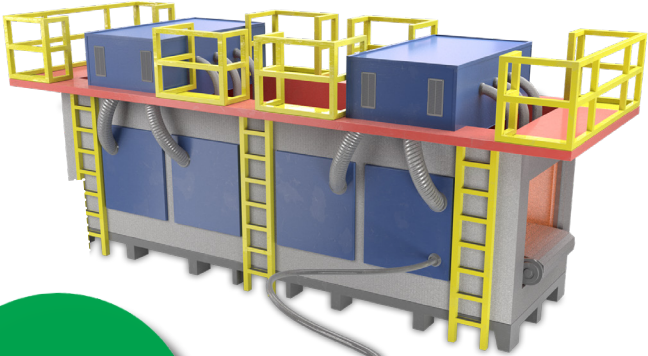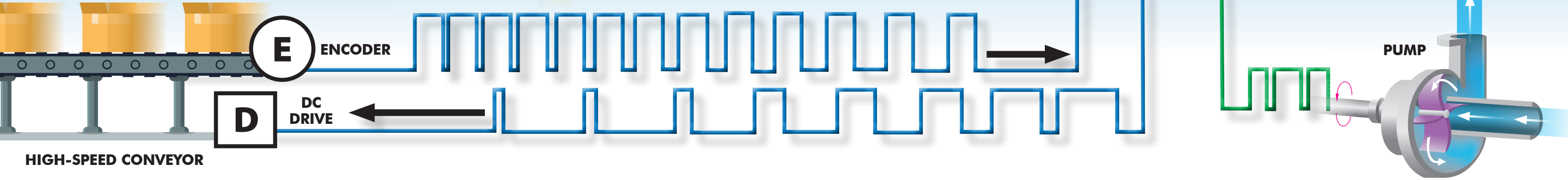
HSC Module priced at $86.00 (P1-02HSC)

PWM Module priced at $95.00 (P1-04PWM)

INDUSTRIAL OVEN

LED GROW LIGHTS

PUMP

E ENCODER

D DC DRIVE

HIGH-SPEED CONVEYOR
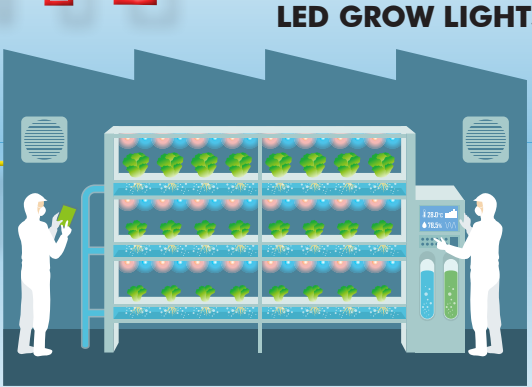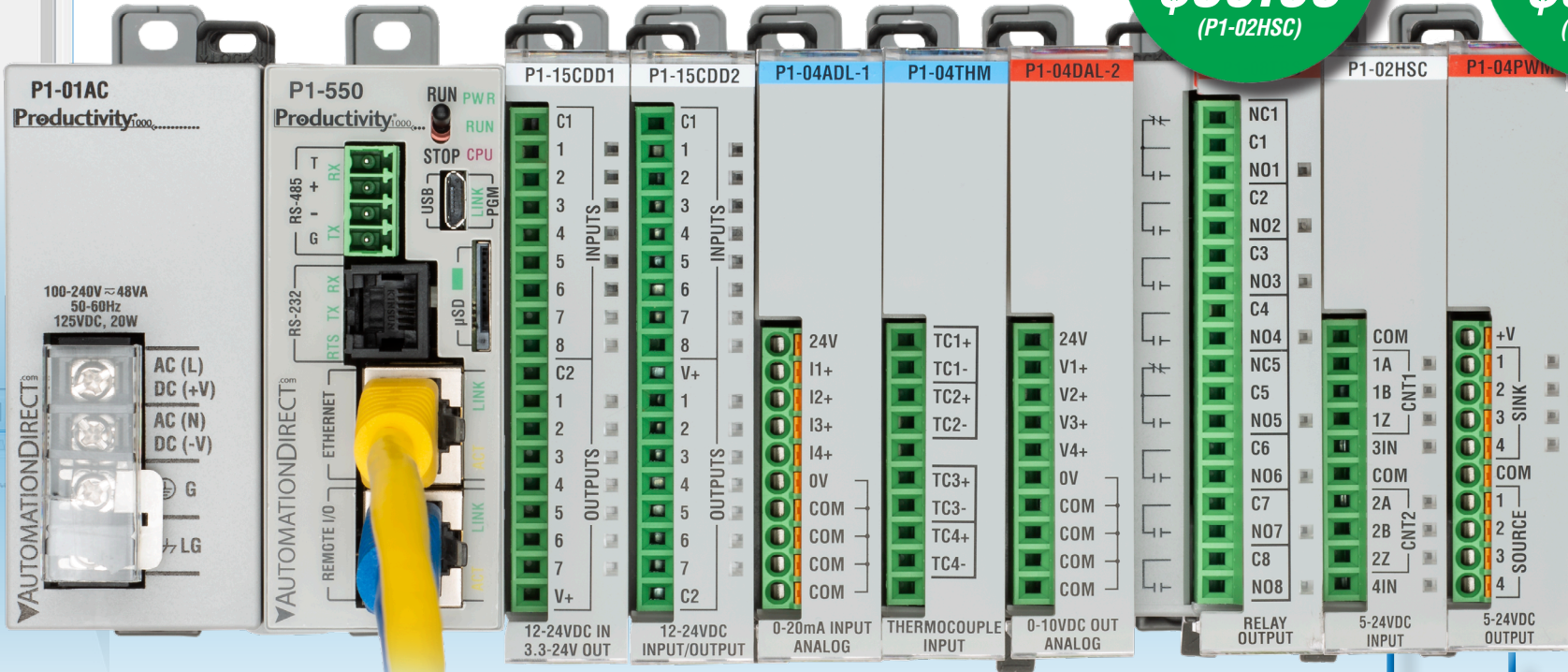
Pulse Width Modulation (PWM)

The P1-04PWM pulse width modulation module provides four channels of sinking or sourcing 0–20 kHz, 0–100% duty cycle outputs. The varying pulse widths produced by the PWM module are seen as varying power levels to the end device and are ideally suited for running motors/pumps, controlling LED lighting, opening/closing solenoid valves and more.

2 YEAR WARRANTY

45-day Money-Back Guarantee 45 day

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TOP RATED ★★★★★ BY CUSTOMERS

Fast Programming with FREE downloadable software

FREE Downloadable Software for many products see website for details

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 quick, user-friendly way to efficiently program the Productivity family of PLCs.

Program your way!
Tag name based control that's powerful and easy to use

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.

ProductivitySuite
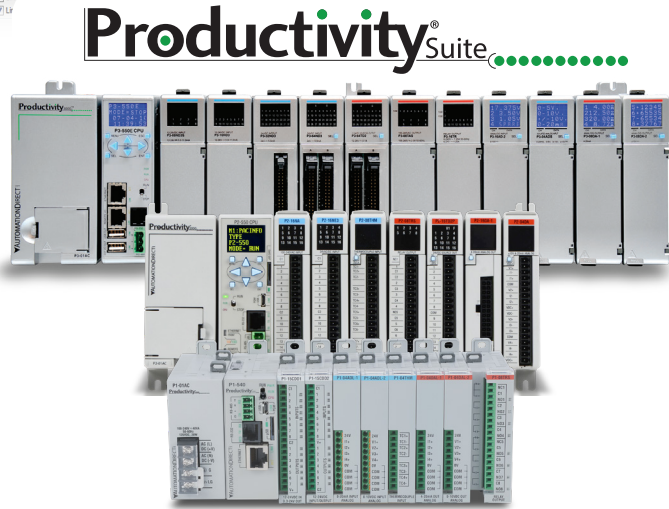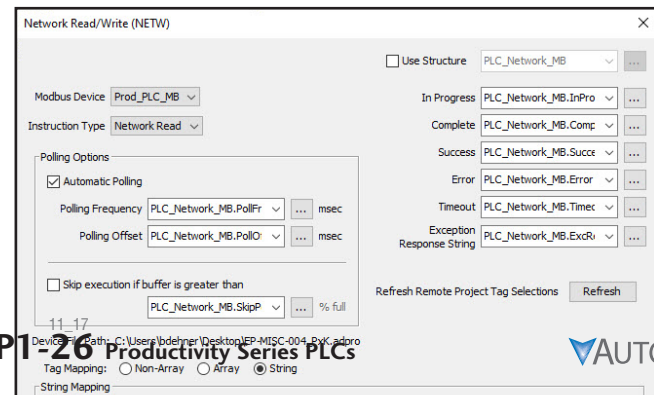
ONE SOFTWARE PACKAGE PROGRAMS ALL PRODUCTIVITY PLCS!

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.
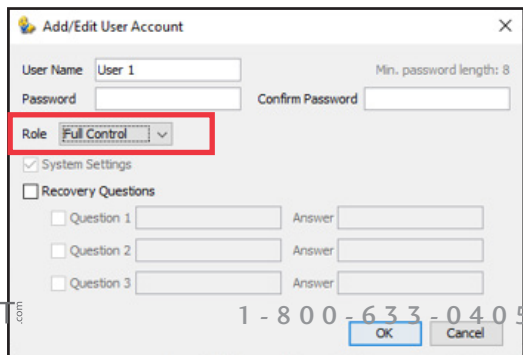
Simple simulation

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.
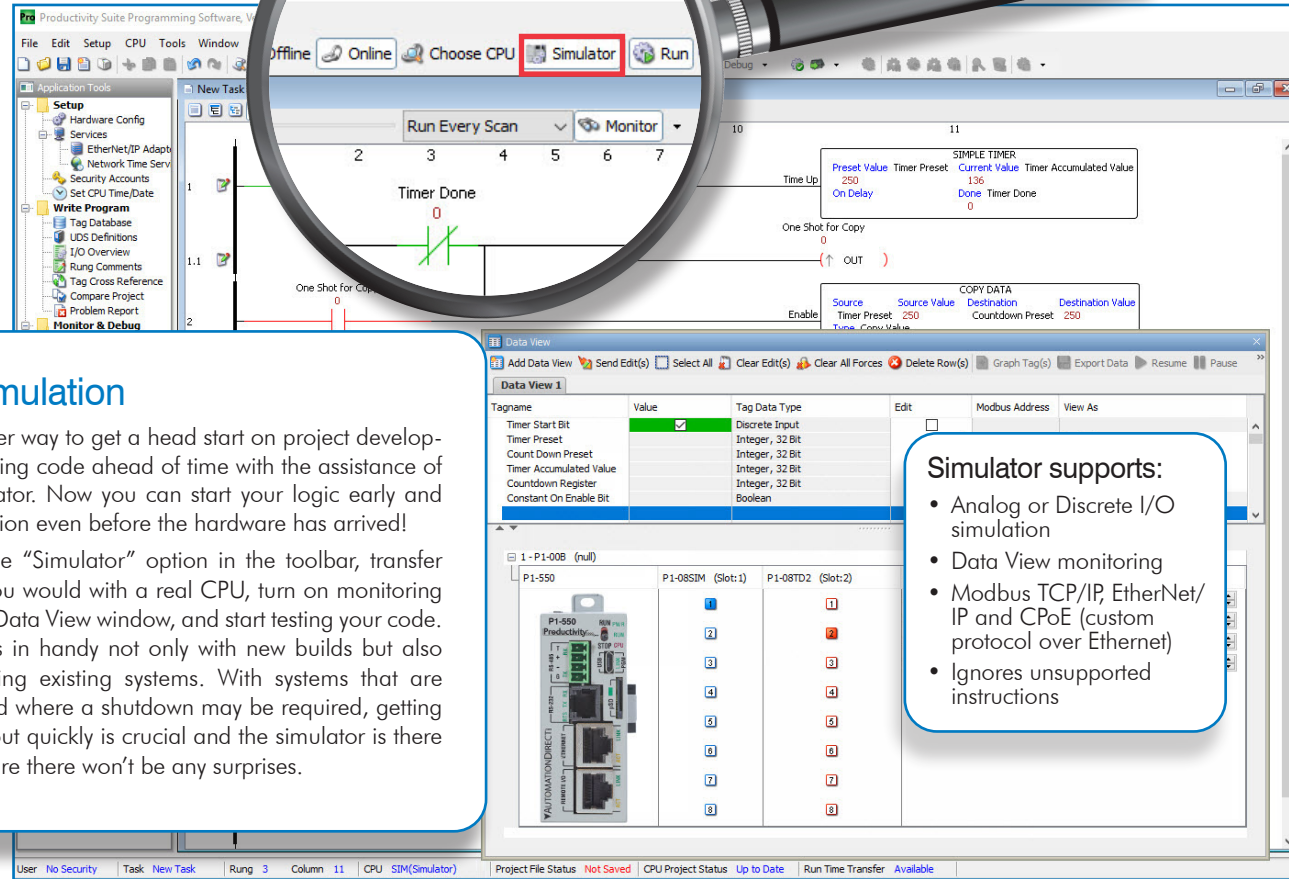
Simulator supports:
- Analog or Discrete I/O simulation
- Data View monitoring
- Modbus TCP/IP, EtherNet/IP and CPoE (custom protocol over Ethernet)
- Ignores unsupported instructions

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.
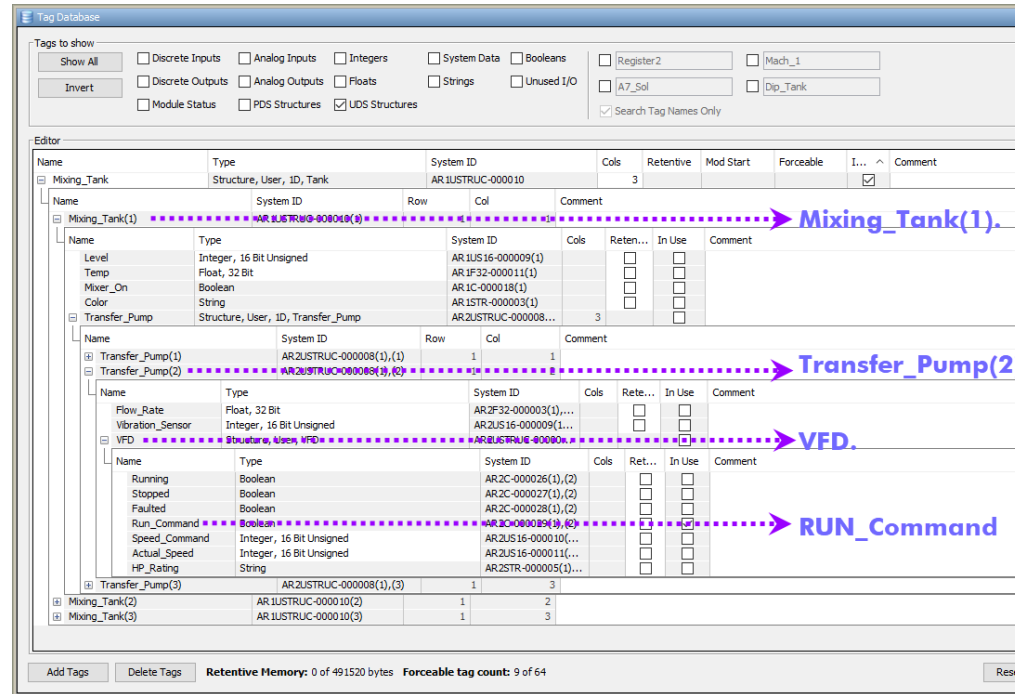
Mixing_Tank(1).
Transfer_Pump(2).
VFD.
RUN_Command

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We want the opportunity to serve anyone in need of an affordable automation solution. Whether you're dealing with tight budget constraints or you're just tired of getting squeezed for every last dollar you have, the Productivity series of PLCs has a solution for you.

With a focus on customer satisfaction, the Productivity1000 PLC was designed to provide the advanced features you need at a price anyone, not just the big guys, but anyone can afford. On top of the low-cost hardware, you also get FREE software, FREE tech support for the life of the product, FREE training and many other goodies to help you smoothly and successfully complete your project.
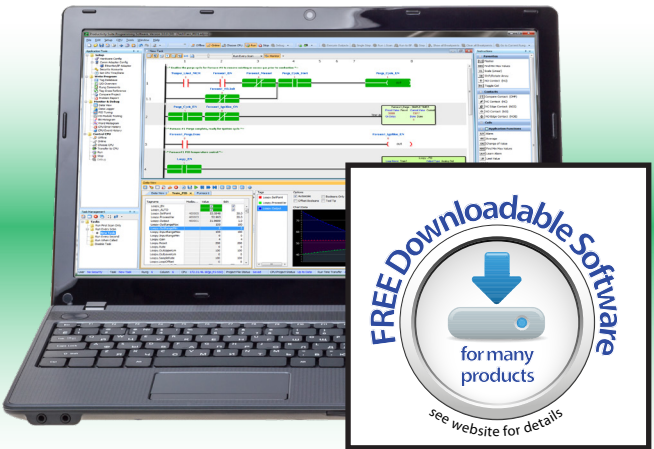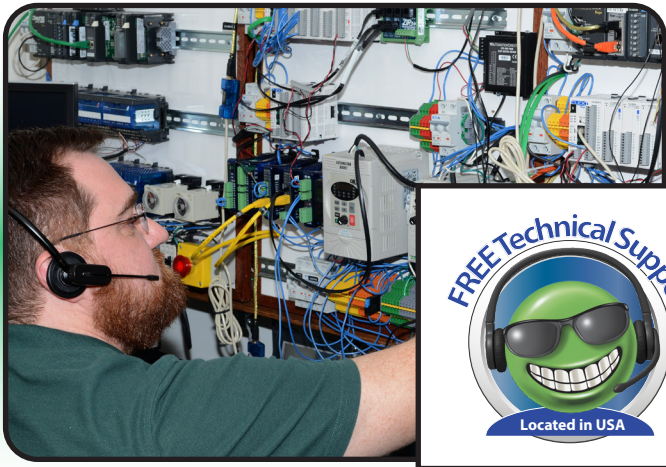
P1-540 CPU
priced at:
$237.00
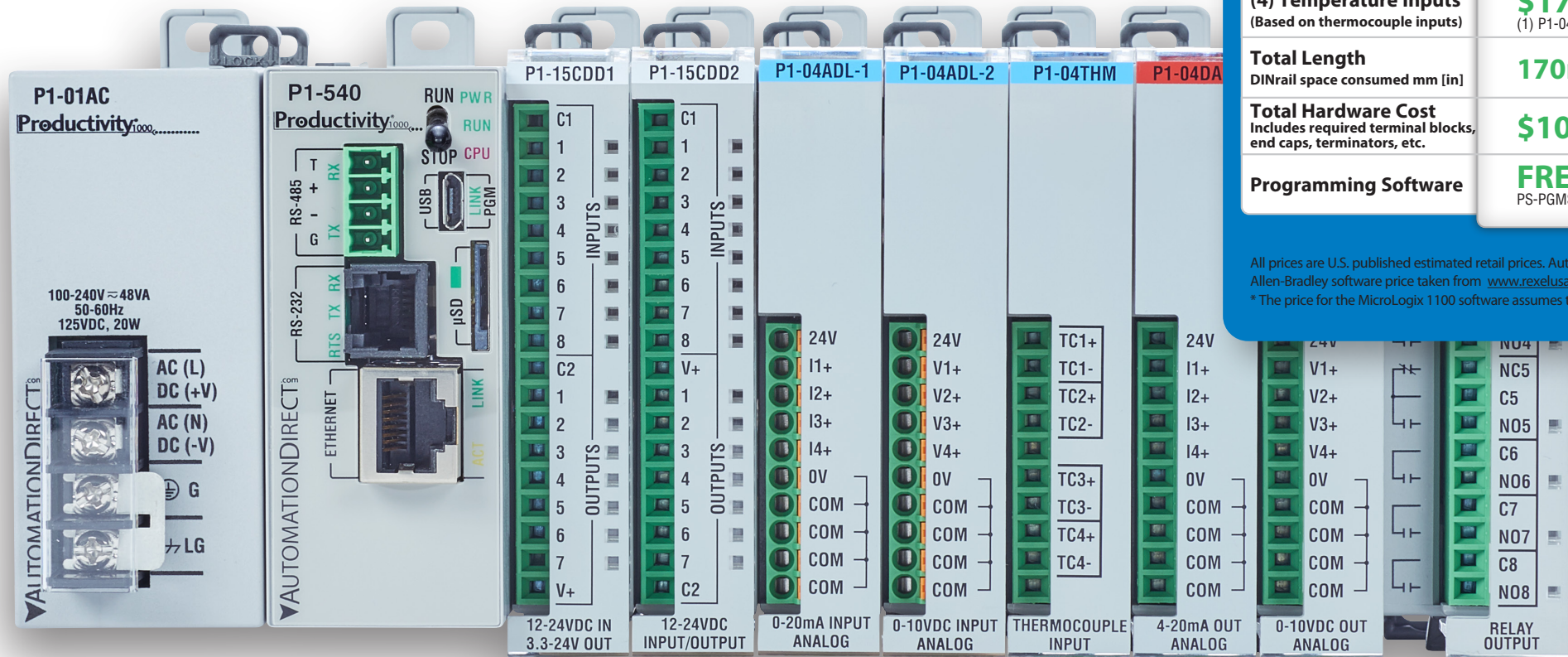
CPU and I/O Comparison	AutomationDirect Productivity1000	VS.	Allen-Bradley Micro850	Allen-Bradley MicroLogix 1100
CPU/PLC (with Ethernet)	**$237.00** P1-540		**$442.00** 2080-LC50-24QVB	**$758.10** 1763-L16BBB
(40) 24VDC Inputs (Built-in I/O included)	**$425.00** (5) P1-15CDD1 combo		**$586.00** (1) 2085-IQ32 + (2) 2085-OV16	**$921.11** (1) 1762-IQ32T + (1) 1762-OB32T
(32) 24VDC Outputs (Built-in I/O included)				
(4) Analog Inputs (Built-in I/O included)	**$95.00** (1) P1-04ADL-1		**$222.00** (1) 2085-IF4	**$405.00** (1) 1762-IF2OF2 combo
(4) Analog Outputs (Built-in I/O included)	**$134.00** (1) P1-04DAL-1		**$222.00** (1) 2085-OF4	
(4) Temperature Inputs (Based on thermocouple inputs)	**$172.00** (1) P1-04THM		**$343.00** (1) 2085-IRT4	**$578.00** (1) 1762-IT4
Total Length DINrail space consumed mm [in]	**170mm [6.7"]**		**349mm [15.50"]**	**270mm [10.63"]**
Total Hardware Cost Includes required terminal blocks, end caps, terminators, etc.	**$1063.00**		**$1,830.20**	**$1,893.42**
Programming Software	**FREE** PS-PGMSW		**FREE** Connected Component WB	**$5,890.00** 9324-RL0700NXENE*

All prices are U.S. published estimated retail prices. AutomationDirect prices as of 12/07/2022. Allen-Bradley hardware prices taken from www.radwell.com 11/05/2020. Allen-Bradley software price taken from www.rexelusa.com 11/05/2020.
* The price for the MicroLogix 1100 software assumes the professional version, which includes RSNetWorx for EtherNet/IP configuration. No EtherNet/IP = $2,670

P1-01AC Productivity1000

100-240V ≈ 48VA
50-60Hz
125VDC, 20W

P1-540 Productivity1000

RUN PWR
RUN
STOP CPU

P1-15CDD1 P1-15CDD2 P1-04ADL-1 P1-04ADL-2 P1-04THM P1-04DA

12-24VDC IN 3.3-24V OUT | 12-24VDC INPUT/OUTPUT | 0-20mA INPUT ANALOG | 0-10VDC INPUT ANALOG | THERMOCOUPLE INPUT | 4-20mA OUT ANALOG | 0-10VDC OUT ANALOG | RELAY OUTPUT

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Productivity from start to finish

Productivity soars when you have the tools you need to get the job done. The Productivity1000 starter kit and the FREE Productivity Suite programming software provide everything you need to get a jump start on your next application.
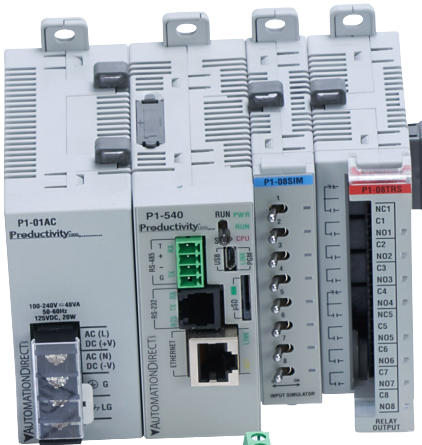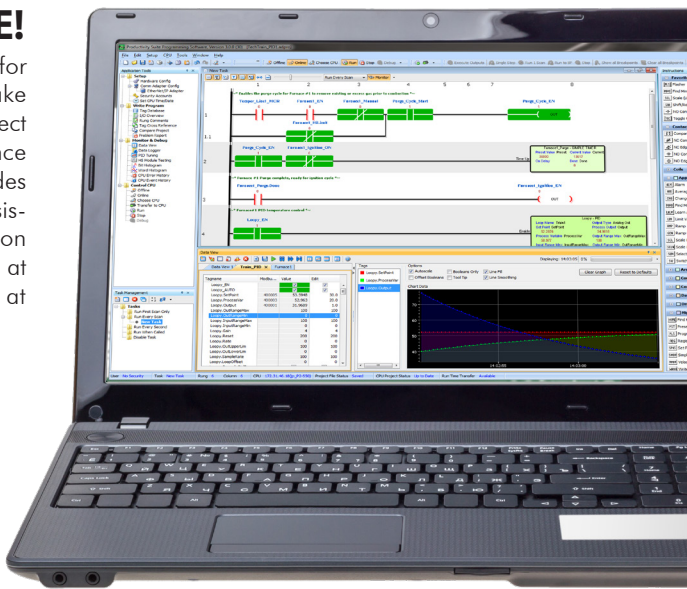
Productivity1000 Starter Kit
$405.00
(P1-START)

FREE Downloadable Software
for many products
see website for details

Don't wait. Get started now for FREE!

The Productivity Suite programming software is available for download free of charge at www.ProductivityPLC.com. Take it for a test drive before you buy or get started on your project immediately. There are no licensing fees or maintenance charges to be concerned with and any subsequent upgrades are available for free download as well. If you need assistance, the embedded help file contains detailed information on over 260 topics; also check out our instructional videos at http://www.automationdirect.com/videos or give us a call at 770-844-4200 - we are here to help.

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2-day Shipping

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45 day

What's in the Starter Kit?

- ✓ (1) P1-540 CPU
- ✓ (1) P1-01AC power supply
- ✓ (1) P1-08SIM input simulator module
- ✓ (1) P1-08TRS relay output module
- ✓ (1) P2-RTB screw type terminal block
- ✓ (1) P2-RTB-1 spring clamp terminal block
- ✓ (1) Power terminal block
- ✓ (1) RS-485 4-pin terminal block
- ✓ (1) ZL-P1-CBL10 ZIPLink cable
- ✓ (1) ZL-RTB20-1 ZIPLink feedthrough connector module
- ✓ (1) USB-CBL-AMICB6 programming cable
- ✓ (1) MICSD-16G microSD memory card
- ✓ (1) 3-wire power cable
- ✓ (1) Product inserts for Productivity1000 hardware items
- ✓ (1) Battery backup

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.

Click on part number (in second row) to be taken directly to AutomationDirect.com to check current pricing, stock status, tech specs, industry approvals, videos, photos and more . . .

Feature	Productivity3000	Productivity2000		Productivity1000	
	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	✔	✔	✔ (also supports MQTTS)	✔	✔
Modbus RTU (serial) & Modbus TCP (Ethernet)	✔	✔	✔	✔	✔
Remote I/O Expansion Rack Support	✔	✔	✔*	✔	---
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	✔	✔	✔	---	---
Integrated GSDrive Support	✔ 32 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 connections if configured for multipurpose Ethernet.
** Project transfer from the microSD card is not supported in the Productivity1000 CPUs.

Productivity Series

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