

WELCOME TO THE WORLD OF COMPLETE AUTOMATION

**Ultimate Performance.  
Ultimate Flexibility.**



**Ultra3000 Digital Servo Drives**



Bringing Together Leading Brands in Industrial Automation

# Providing A Global Solution

The Ultra3000™ family creates a complete set of servo drive products ranging from simple stand-alone indexing applications to multi-axis integrated motion. These high-performance, digital servo drives meet global voltage requirements and provide flexibility to perform in a variety of machine control architectures. In addition, the Ultra3000 drive is integrated with both the ControlLogix™ and SoftLogix™ platforms via SERCOS interface™ for Kinetix Integrated Motion. The Ultra3000i™ digital servo drive with indexing adds basic control capability to the Ultra3000 feature set.

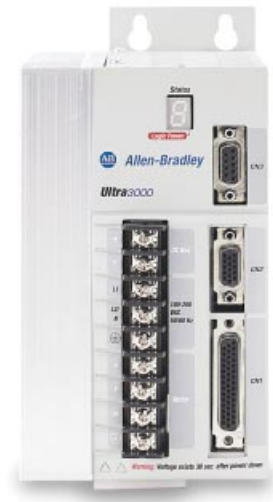
The Ultra3000 and Ultra3000i use the Ultraware™ software configuration and diagnostic tool set, which includes sophisticated digital scope capability, a comprehensive array of diagnostics, and a file management system that helps organize multiple configuration files and motion programs. The Ultra3000 with SERCOS drive, part of the Kinetix Integrated Motion solution, is configured through RSLogix 5000™ software providing one platform for both motion and machine control.

To complete your system, the entire Ultra3000 family operates a wide variety of Allen-Bradley® high-performance rotary servo motors. The Ultra3000 also offers seamless support of high-performance linear motors for your most demanding linear motion applications.

## A Broad Range of Power and Flexibility

- ❖ The Ultra3000 provides simple integration into Allen-Bradley machine control architectures.
- ❖ The Ultra3000 can operate a wide variety of brushless servo motors, including Allen-Bradley MP-, F-, Y-, N- and W-Series and 1326AB motors along with linear and third-party motors.
- ❖ Ultra3000 drives use Smart Motor Technology to provide automatic identification of the specific motor connected to the drive. This reduces commissioning time and safeguards against incorrect motor replacement.
- ❖ The Ultra3000 family accepts high resolution encoder feedback for demanding, high precision applications.
- ❖ The Ultra3000 incorporates application-proven designs, tested individually and within overall architectures, to provide world-class reliability and increase your machine productivity.
- ❖ The Ultra3000i's built-in indexing capability can eliminate the need for a motion controller or PLC™ card for point to point positioning moves.
- ❖ To eliminate costly and time consuming machine homing cycles, the Ultra3000 has built-in support for multi-turn absolute encoders or an option to supply external logic power to maintain position during power loss.
- ❖ With Ultraware software the Ultra3000 has a powerful commissioning and diagnostic tool designed to increase your productivity and optimize system performance quickly and easily.
- ❖ When using the Ultra3000 with RSLogix 5000 software as an integrated motion solution, programmers can easily configure and add drives and motion axes using wizard-based configuration dialogs.

<sup>1</sup> SoftLogix with SERCOS interface is available with RSLogix 5000 version 12 or higher.



*Ultra3000 30 Amp Servo Drive*

### Ultra3000 Features:

- 100-480V AC options, single and three phase input
- SERCOS or DeviceNet™ connectivity options
- 7.5A to 150A peak current capability
- Standard high-density D-Shell connectors
- Field programmable flash memory firmware storage
- Seven segment LED for status and error codes
- Eight selectable general purpose inputs
- Four selectable general purpose outputs and relay output
- Serial port for RS-232/RS-485 communications
- CE compliance and UL® listed to U.S. and Canadian safety standards



*Ultra Family*

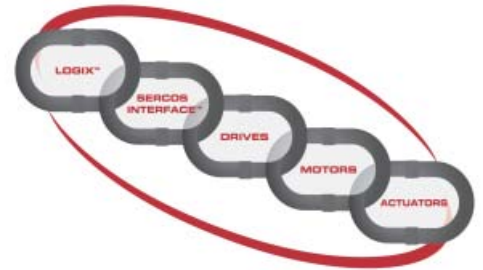
# Kinetix™: The New Science of Integrated Motion

## The Ultra3000 as Part of the Kinetix Integrated Motion Solution

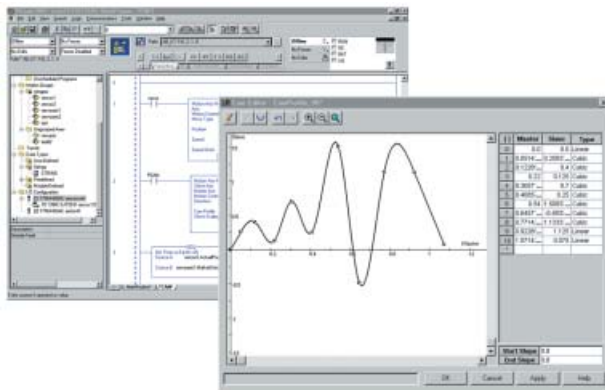
Kinetix Integrated Motion is a combination of architecture, A-B world class motion products, and motion application expertise. This true integrated motion solution helps save you time and money while increasing productivity. Your application moves along smoothly, with improved performance and effortless precision. As part of the Kinetix solution, the Ultra3000 is designed to provide OEM machine builders integration into Allen-Bradley's Logix architecture via direct SERCOS digital interface. The Logix™ technology combines motion and sequential control functionality into a single multi-tasking control platform resulting in lower system costs, easier maintenance and simplified system installation.

In addition, the RSLogix 5000 software used to program the Kinetix Integrated Motion solution allows programmers to easily configure and add drives and motion axes using wizard-based configuration dialogs. Simple or complex motion profiles can be created with the advanced graphical motion profile editor by inserting any of the comprehensive built-in motion instructions into ladder, structured text or sequential function chart application programs. RSLogix 5000 even provides graphical on-line trending for advanced drive diagnostics.

# Kinetix



*Kinetix Integrated Motion is a combination of architecture, A-B world class motion products, and motion application expertise.*



*Ultra3000 drive configuration is made easy using RSLogix 5000's motion configuration wizards. Even the configuration of a CAM profile can be easily accomplished.*

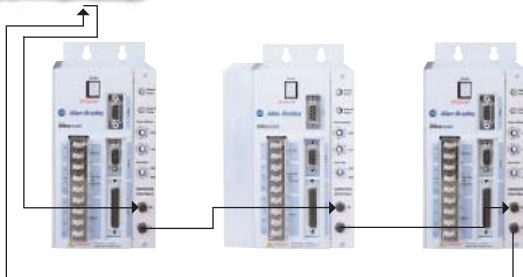
The Ultra3000 digital servo drive is optimized to seamlessly interface with Logix via the 1756-M08SE, 1756-M16SE or 1784-PM16SE motion modules providing multiple axes of coordinated motion.

### Features of the Kinetix Integrated Motion solution using the Ultra3000:

- Single software package for sequential and motion control
- Seamlessly interfaces with ControlLogix 1756-M08SE and 1756-M16SE or SoftLogix 1784-PM16SE motion modules
- Provides many axes of coordinated motion control
- Electrical noise immunity
- Simplified wiring
- Programming and commissioning performed from one software package: RSLogix 5000
- Advanced drive diagnostic capabilities
- Graphical on-line trending
- Simplifies field replacement of drives



ControlLogix System



SERCOS Fiber Optic Ring

Ultra3000 with SERCOS



**SERCOS (Serial Real-time COmmunications System) is an open controller-to-digital drive interface specifically designed for high-speed, real time, serial communications using noise-immune, fiber optic cables.**



# Architecture Flexibility: Simple Integration

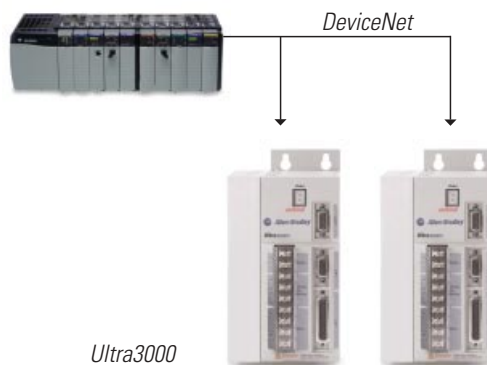
In many applications, motion control is the most important component to reducing cycle times. For higher performance and lower overall automation system costs, the Ultra3000 provides simple integration into a variety of machine control architectures. It accepts SERCOS and DeviceNet connectivity along with analog 0-10V, step/direction and master following command sources across the entire Ultra3000 family.

## Traditional Command Interfaces

The Ultra3000 interfaces with traditional PC-based and stand-alone motion control systems that generate analog torque and velocity commands. Digital velocity and current loops in the Ultra3000 provide excellent, stable performance and the Ultraware software makes them easy to set up. If your application requires accurate velocity control, the eight preset velocities available on the Ultra3000 allow several speeds to be selected using the drive's digital inputs. In addition, the Ultra3000's flexible master/follower mode allows eight different master/follower ratios to be selected using the drive's digital inputs.

## Ultra3000 with DeviceNet

The Ultra3000 with DeviceNet seamlessly interfaces with the DeviceNet architecture. Drive commands can be received via a DeviceNet interface, eliminating control to drive wiring. These features mean less start up time and decreased installation costs. In addition, the Ultra3000 with indexing capability provides a cost-effective package that eliminates the need for a PLC motion card in applications where point-to-point positioning is required.



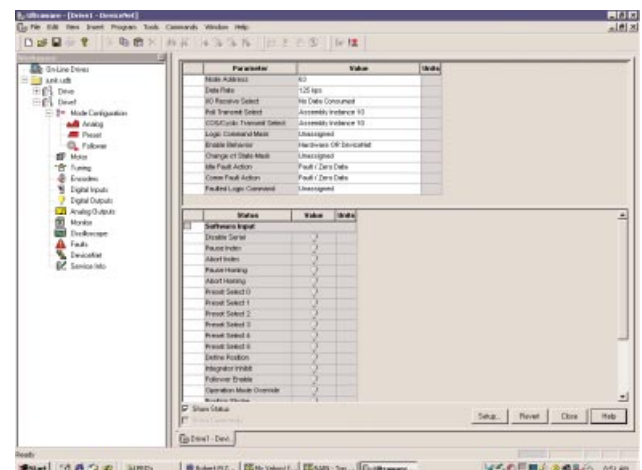
**DeviceNet™**



75 Amp Drive  
with DeviceNet

## Ultra3000 Operating Modes:

- 0-10 analog input for torque, velocity or position control
- Step/directional input (also step up/step down) for electronic gearing with an indexer
- Master follows capability via the auxiliary encoder input for electronic gearing
- Eight preset speeds, torques or gearing ratios selectable via digital inputs and serially
- Dual-loop feedback with auxiliary encoder input for position feedback



# Indexing: Stand-alone Performance Made Easy

## Ultra3000 indexing: Cost-Reduce and Simplify Your Solution

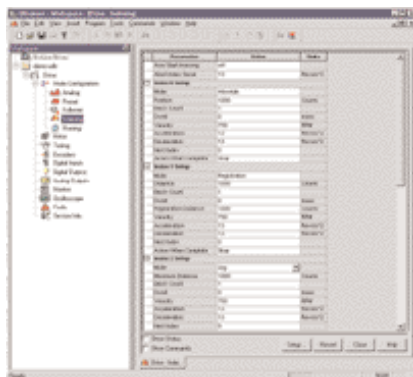
Indexing functionality allows the drive to execute up to 64 different trapezoidal position moves initiated by the use of digital I/O, MMI, or an unlimited number of indexes through the use of the host command language. The benefit of indexing is the ability to obtain the position-control performance and flexibility in applications where electronic motion control systems were not cost-effective in the past.

The indexing drives support four different types of index moves:

- ❖ Incremental—distance move relative to current position
- ❖ Absolute—position move in reference to home position
- ❖ Jog—move executed when input level is high
- ❖ Registration—distance move relative to registration sensor input

The Ultra3000i indexing drive allows you to define the following parameters for each index profile:

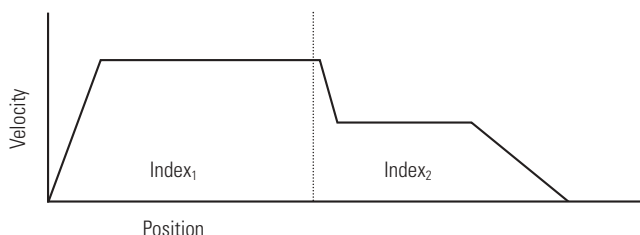
- |                          |                |               |
|--------------------------|----------------|---------------|
| ❖ Index type             | ❖ Velocity     | ❖ Dwell Time  |
| ❖ Distance (positioning) | ❖ Acceleration | ❖ Next Index  |
| ❖ Registration Distance  | ❖ Deceleration | ❖ Batch Count |
| ❖ Action when Complete   |                |               |



*Ultra3000i  
Indexing  
with Ultraware*

## Blended Moves

Blended moves extend the positioning capability of the Ultra3000i by allowing it to finish an index move at a nonzero velocity and immediately begin the next specified move. As the picture illustrates, one index can immediately lead to a second without stopping. Blended indexes are easily set up in Ultraware.



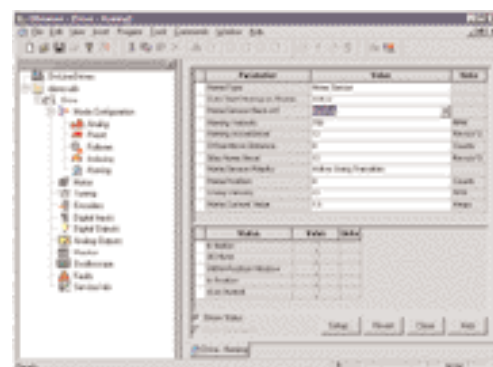
### Features of the Ultra3000 with indexing:

- 64 configurable index profiles for absolute, incremental, registration, and job type positioning
- Ability to blend indexes with a non-zero velocity
- Built-in homing routines
- Eight preset positions for control of an index's progress via a digital input

## Home Routines

The Ultra3000i offers a user-defined home routine, which allows you to home the axis without the aid of other devices. Using Ultraware, you can select one of the following different home routines to match your motion application:

- |                                   |                         |
|-----------------------------------|-------------------------|
| ❖ Home-to-sensor-to-marker        | ❖ Home-to-marker        |
| ❖ Home-to-sensor                  | ❖ Home-to-current value |
| ❖ Home-to-current-value-to-marker |                         |



*Ultra3000i  
Homing  
with Ultraware*

# A Broad Range of Servo Motors to Fit Any Application



## MP-Series Low Inertia Brushless Servo Motors

MP-Series low inertia, high output, brushless servo motors feature a design that reduces motor size while delivering significantly higher torque. Available in seven frame sizes, these motors provide continuous torque from 1.58 to 163 Nm (14-1442 lb-in.), with a peak torque range of 3.3 to 271 Nm (29 – 2398 lb-in.). Motors feature speeds up to 5000 rpm, and an absolute feedback option eliminates the need for a homing routine.



## MP-Series Integrated Gear Motors

The MP-Series Integrated Gear Motor line offers a compact motor and gearbox combination for high torque applications with limited space. Available in three frame sizes, these motors provide continuous torque from 14 to 700 Nm (124-6195 lb-in.) and peak torque from 32 to 1300 Nm (283-11,500 lb-in.).



## 1326AB Brushless Servo Motors

1326AB medium inertia brushless servo motors with high resolution feedback are specially engineered for high continuous output and smooth performance. Available in three frame sizes and a wide torque range (2.7-50.0 Nm), the encoder based version of this series of servo motors is intended to be used with the Allen-Bradley Ultra Family drives and is available with multi-turn absolute option.



## F-Series Medium-Inertia Brushless Servo Motors

F-Series motors, mechanically interchangeable with the MP-Series low inertia motors, use a ferrite magnet that provides nearly five times greater inertia than the MP-Series for matching larger-load inertias. Available in two frame sizes, the F-Series motors range in continuous torque capability from 3.5 to 28 Nm (31 to 245 lb-in.) and speeds to 4000 rpm. The F-Series motors use an optical 2000-line incremental encoder (5000-line optional) for superior low-speed performance with the Ultra Family.



## Y-Series Small, Low-Inertia Brushless Servo Motors

Y-Series motors, available in either 115V or 230V windings, use a high-energy neodymium magnet that provides low inertias for fast acceleration. Available in three popular metric frame sizes, the Y-Series motors range in continuous torque capability from .17 to 2.5 Nm (1.5 to 22 lb-in.) and speeds up to 4500 rpm. Their outstanding torque-to-size ratios make the Y-Series a powerful combination with the Ultra Family drives.



## N-Series NEMA-Style Brushless Servo Motors

N-Series motors use a high-energy ring magnet rotor construction for outstanding torque-to-size ratio. Available in four common NEMA-style frame sizes, N-Series motors matched with an Ultra Family drive create a high-performance alternative to stepper systems. They range in continuous torque capability from .18 to 5.3 Nm (1.6 to 47 lb-in.) and speeds up to 7000 rpm.



## W-Series Washdown Brushless Servo Motors

W-Series stainless steel washdown brushless servo motors provide low inertias for fast accelerations and a rugged design especially suited for harsh or high-hygiene environments. Available in two frame sizes, the W-Series motors range in continuous torque capability from 1.7 to 7.2 Nm (15 to 64 lb-in.) and speeds up to 3000 rpm.



## Cables and Accessories

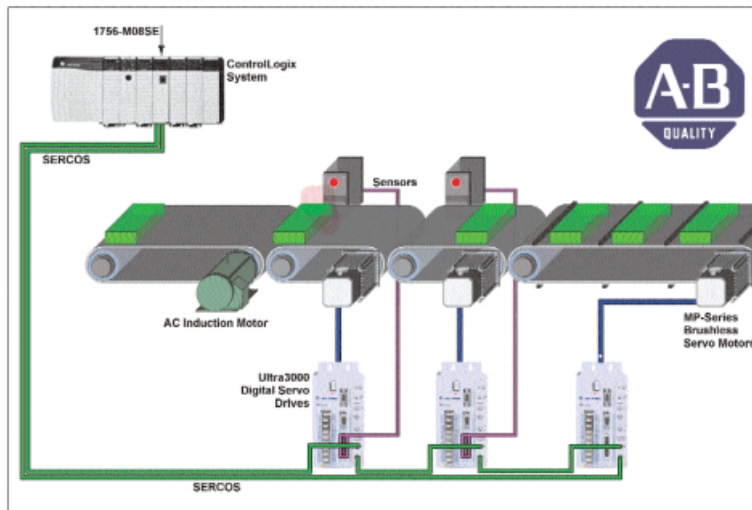
When it comes to motion control systems, efficient commissioning and superior uptime are a direct result of simple, easy-to-understand interconnects and integrity in every component. You'll find that using the standardized cables and accessories designed specifically for the Ultra3000 means fewer problems, more efficient operation, less downtime, and quicker troubleshooting. We've taken great care to ensure that Ultra3000 accessories provide unquestionably sound connections, long life, and superior performance.

## Ultra3000 Digital Servo Drive Specifications

ELECTRICAL CHARACTERISTICS		2098-DSD-005 2098-DSD-010 2098-DSD-020	2098-DSD-030 2098-DSD-075 2098-DSD-150	2098-DSD-HV030 2098-DSD-HV050 2098-DSD-HV100	2098-DSD-HV150 2098-DSD-HV220
Peak Output Current (Amps)		7.5/15/30	30/75/150	14/22/46	68/94
Continuous Output Current (Amps)		2.5/5/10	15/35/65	7/11/23	34/47
Continuous Output Power (kW)		0.5/1/2	3/7.5/15	3/5/10	15/22
INPUT					
Continuous Input Current (Amps RMS)		5/9/18	28/30/46	4/7/14	20/28
Input Voltage		100-240 Volt AC Single-Phase (Three-Phase for -075 and -150)		230-460 Volt AC Three-Phase	
Auxiliary Power		Optional 5 Volt DC external logic power			
Input Frequency		12-24 Volt DC required for Digital I/O 47-63 Hz			
OPERATING MODES AND COMMAND SOURCES Ultra3000					
Analog Velocity/Current Mode		+/- 10 Volt input			
Preset Velocity, Current, and Follower Ratios		8 presets, binary selection by digital inputs or serial commands, electronic gearing			
Step and Direction, Step Up/Step Down		2.5 MHz maximum frequency, Differential or single-ended input			
Master Encoder Following		2.5 MHz maximum line frequency, Differential or single-ended input			
Digital Serial Commands		Via serial port and 7-bit ASCII protocol			
Modes		Current, Velocity, Postion control			
OPERATING MODES AND COMMAND SOURCES Ultra3000i					
Indexing		64 configurable indexes, selectable by digital inputs or serial commands			
		Blended moves at a nonzero velocity, Jogging, Stop Index via digital input or serial command			
Positioning Types		Absolute, Incremental, Registration, Jog			
Home Routines		Home-to-sensor, home-to-marker, home-to-sensor/marker, or home-to-current-value			
SERCOS		SERCOS interface			
Languages		Ladder, Structured Text and Sequential Function Chart			
INPUTS/OUTPUTS					
General-Purpose Digital Inputs		8 Optically Isolated 12-24 Volt, Active High Inputs - Assignable to one or more selections			
General-Purpose Digital Outputs		4 Optically Isolated 12-24 volt Outputs, 50 Milliamperes Maximum			
General-Purpose Relay Output		1 Normally Open Relay, 30 volts DC Maximum Voltage, 1 Ampere Maximum Current			
Registration Input Capture Response		<100 useconds			
Analog Command Input		1 14-Bit Analog-to-Digital Converter (+/- 10v, Differential)			
General-Purpose Analog Output		1 8-Bit Digital-to-Analog Converter (+/- 10v, +/- 2mA, single-ended)			
COMMUNICATIONS					
Serial		1 port with RS-232/RS-422/RS-485 at 1200-57,600 baud			
Networking		DeviceNet			
MOTOR FEEDBACK					
Input Modes		Incremental with Index, Sine/cosine High Resolution Absolute (Single and Multi-turn)			
Maximum Input Frequency		2.5 MHz (Encoder Lines), Over 1 million counts/rev (High Resolution)			
Commutation Startup		Hall Sensor			
AUXILIARY FEEDBACK					
Operation		Auxiliary Position Loop Feedback Input			
Input Modes		A quad B			
Input Type		Line Receiver			
Maximum Input Frequency		2.5 MHz (Encoder Lines)			

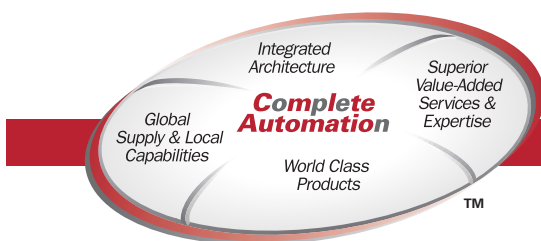
HV indicates the 230-460V AC version of the drive

All drives available in indexing, non-indexing, SERCOS, DeviceNet or indexing DeviceNet versions



**A Kinetix Integrated Motion Solution:**  
Smart Belt with Ultra3000 Digital Servo Drive and ControlLogix SERCOS interface

Rockwell Automation is an automation leader who not only develops innovative technology, but has the expertise and global supply network to be your complete automation solution provider. Rockwell Automation offers worldwide customer support capabilities. And, through a network of partnerships, Rockwell Automation brings together reliable, knowledgeable people from all corners of the automation world to meet your needs. As a part of Complete Automation™, the Ultra3000 family of world-class motion control products was designed with built-in reliability for long life and superior performance. In addition to stand-alone control, the Ultra3000 offers the flexibility of platform integration with ControlLogix and SoftLogix. This flexibility provides you with the most efficient flow of information to meet your needs from the simplest device to the highest-level information system. You can depend on Complete Automation to help you achieve increased productivity and lower total cost of ownership.



## World-Class Motion Control with Worldwide Support

To put the Ultra3000 to work for you, Rockwell Automation has a worldwide network of sales and service engineers and authorized system integrators. Together, they offer the industry's broadest range of support services to help you implement your motion control solution.

Our Motion Solution Managers are specialists in motion control and servo drive technology. They have the expertise to evaluate your

application requirements and help you achieve the optimum solution.

Rockwell Automation Global Manufacturing Solutions offers application engineering services, system startup, training, field service, and ongoing product support. They also offer an emergency HELP line—a 24-hour, toll-free evaluation and service connection.

Our network of authorized motion control system integrators can provide complete integration services for new, retrofit, or rebuild requirements worldwide.

For more information on the Ultra3000 or any of our support services, contact your nearest Rockwell Automation sales office or motion control distributor, or refer to our Web site: **[www.ab.com/motion](http://www.ab.com/motion)**

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**[www.rockwellautomation.com](http://www.rockwellautomation.com)**

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