









# NextNove Multi-axis Motion Controllers



# **NextMove** Motion Control Solutions

### Motion control solutions today to meet tomorrow's demands

With today's automation applications demanding increasing speed and flexibility to stay ahead, finding a control solution to meet those demands can be difficult. Baldor has the answer. Utilizing a high performance processor core coupled with the power, flexibility and ease of use of Baldor's Mint<sup>®</sup> programming language, the NextMove range of motion controllers can take on the most demanding of multi-axis applications.

#### A History of Success

Baldor's motion controllers have been at the heart of automation machines for nearly two decades. The NextMove motion controller family is synonymous with power, flexibility and versatility. Operating around the world, NextMove has met the demands of a rapidly developing automation world, providing increased productivity, reliability and flexibility.

### **Flexible Programming**

At the heart of NextMove's success and proven capability is Baldor's highly acclaimed motion programming language, Mint<sup>®</sup>. Mint provides a high level, easy to use programming language that encapsulates the needs of multi-axis motion, HMI, communications, I/O machine control and more. Mint allows the NextMove motion controllers to operate in a stand-alone capacity without the need for a PC or PLC. Mint ActiveX<sup>®</sup> controls also allow complete freedom to program motion, I/O sequencing and monitoring from any Windows application. ActiveX applications can be run in parallel to the embedded Mint application for increased flexibility.















## > Total Automation Solutions



Baldor is one of the industry leaders in providing a complete solution for multi-axis automation applications. The full range of multi-axis motion controllers, high performance servo drives, rotary servo motors and linear motors are designed to seamlessly interface with each other. This allows you to get on with the important task of bringing your machine to market.

#### **Flexible Processor Architecture**

The NextMove architecture uses floating point Digital Signal Processor (DSP) technology coupled with a Field Programmable Gate Array (FPGA). The FPGA handles those functions normally reserved for external discrete logic devices, such as I/O, encoder feedback and stepper pulse generation. In using an FPGA, the NextMove architecture becomes much more flexible. Changes can be made at a 'hardware' level, without the need to change the physical hardware since these functions are programmed into the device. This provides flexibility to meet bespoke, custom applications. Examples have included re-configuring NextMove ES to control 6 axes of stepper and customizing NextMove PCI-2 to handle a unique 2D position compare output.

Combined, the DSP and FPGA core allow NextMove to tackle the most demanding of applications with ease.

#### Choice of Open or Closed Loop Control

NextMove supports the control of both open loop (steppers) and closed loop (servo and vector) axes giving you versatility and cost saving options where you need them. Open loop control is provided by means of Pulse and Direction signals. These are supported by external stepper drivers, including Baldor's own DSM series of integrated stepper motor/driver. Pulse and Direction inputs are also available on Baldor's range of servo drives.

Closed loop axes are controlled using the industry standard  $\pm 10V$ and encoder feedback signals. These can be used to control servo, vector or hydraulic axes. A fast 6 term PID loop ensures accurate positioning, precise control and smooth operation of the axis.

Baldor's latest NextMove controllers, the NextMove e100 supports the real-time Ethernet protocol, Ethernet Powerlink. Using a standard Ethernet cable, up to 16 axes can be connected together and their motion interpolated. All necessary data such as command reference and position feedback is sent over the Ethernet cable, helping to reduce cost, set-up time and improved system diagnostics

### Flexible Machine Control I/O

NextMove's I/O structure provides a flexible interface to external machine control. I/O points are configured in software for functionality such as safety limits, datum switches, error input and error outputs. You only define the I/O you need for your machine. All I/O can be controlled within the Mint programming language allowing NextMove to handle those tasks typically undertaken by an external PLC. I/O is easily expanded using the onboard CANopen port.

NextMove's I/O capability is further enhanced by Mint's Event structure which deals with time critical responses to the change of state of a digital input. The Mint program can respond quickly and effectively without the need to poll the input state.

### **High Speed Registration Inputs**

For high speed registration applications, a number of the digital inputs can be defined to latch position to less than 1 micro-second. This real-time data can be used to make decisions about product position and is ideally suited to applications such as labeling, packing machines and printing lines.

### **Choice of Communication Interfaces**

NextMove is equally at home operating stand-alone or interfacing directly to a PC or PLC via RS232/485 serial ports, USB, PCI-bus and Ethernet TCP/IP. Baldor gives you the choice to suit your application. PCI-bus is ideally suited for those applications that require large amounts of data transfer between the PC and motion controller. USB handles fast and reliable data transfer between the PC and NextMove with the convenience of an external motion controller.

Every NextMove controller is equipped with a CANopen communication interface. This can be used for I/O expansion (using industry standard DS401 I/O devices), for interfacing to Baldor's HMI devices or for communications with other Mint controllers.



Example network showing 3 groups of Mint controllers connected via the CANopen network.

### **Peer-to-peer Communications**

Built into the Mint programming language is the ability for any Mint based controller, such as a NextMove controllers or Baldor's versatile programmable servo drives, Flex+Drive®-II or MintDrive®-II, to communicate with each other over the CANopen network. Unlike many other networks, peer-to-peer communications can take place between each node on the network. This can be used to exchange data or implement a hierarchical control network. This communication capability allows additional axes to be added to a machine for expansion or machine variants.

#### **Ethernet Communications**

NextMove e100 is our latest generation motion controller to join the NextMove family. NextMove e100 sports a real-time Ethernet link, utilizing Ethernet Powerlink. This allows up to 16 axes of interpolated motion and many more axes of indexing motion. Alternatively, NextMove e100 can be configured for standard TCP/IP mode for interfacing with the factory network for remote diagnostics or recipe data updates.

ETHERNET **POWERLINK** real-time technology Refer to catalog BR1202-I for full information on Baldor's real-time Ethernet Solution



# Mint<sup>®</sup> – The Programming Language for Automation

- High speed compiled BASIC programming language for motion and machine control
- Multitasking capability for motion, I/O, HMI and communication tasks, allows complex applications to be broken down into simpler, more manageable sub-tasks
- Modular programming capability, including functions and subroutines, allows for code re-use and ease of debugging
- Common programming interface for both NextMove and Baldor's intelligent drives, reduces the learning curve

### BASIC - the de-facto Programming Language

With 20 years of history, Mint<sup>®</sup> was designed from the outset around the BASIC programming language. It was understood then, and is still true today, that BASIC is the de-facto programming language around the world. Now in its fifth generation, Mint fully embraces all the modern BASIC programming functionality including features such as multitasking, functions and subroutines, data types and local data. This functionality makes it simple to write and develop modular programs that are easily understood by others, easily maintained and easily re-used across different applications. Mint's Code Library makes code re-use easy by allowing snippets of code to be stored and used within other projects. This is just one of the many features in the Mint development front end, Mint WorkBench, which are designed to get you up and running quickly.

#### More than just Motion Control

Mint excels in motion control applications, but is equally at home in HMI interaction, communications, I/O handling and complex mathematical functions. While some choose a standard 'open' PLC language platform that offers a 'standard' set of motion features, those looking for an edge will find it in the advanced motion capabilities of Mint. Many industries at the cutting edge of motion control realize this and find PLC technology limited in its capabilities for motion control.

Realizing that today's applications are more demanding, more precise, more dynamic and more complex, Mint focuses on providing creative features, advanced motion capabilities and features for the user to innovate in the application solution.

- Comprehensive library of motion types including interpolated moves, cam profiling, flying shears, gearing and more
- Comprehensive Windows tools including color keyword highlighting in the editor, software oscilloscope, online help, drive configuration wizard and auto-tuning
- ActiveX components (supplied free of charge) aid in the development of Microsoft Windows<sup>®</sup> front end applications



### **Multitasking Streamlines Program Flow**

With many devices to control and machine functions to coordinate, it often helps to be able to structure code into specific tasks and allocate them resource dynamically at runtime. Multitasking is one of the key features of Mint. Numerous software tasks can be written, initiated, suspended, terminated and prioritized at will, to optimize workflow and improve machine performance. In its simplest form consider that separate program tasks can be allocated to functions of motion control, HMI interaction, I/O control, communications and much more, producing a structured programming solution and ensuring more dynamic program flow.

### **Time Critical Functions Handled with Ease**

Time critical functions, such as responding to the change of state of inputs are handled with ease by Mint's event structure. Using the event structure within Mint is more efficient and faster than polling the state of an input. Events can be triggered for digital inputs, move buffer low, errors, position latches and more.

With a large onboard memory, the multitasking capabilities of Mint can also be used to store multiple programs, for example, to define machine recipes. Each task can have its own independent data storage, functions and subroutines.

# **Comprehensive Library** of Move Types

## Powerful Move Buffer Enables Continuous Motion and More

All axes have a flexible and powerful move buffer system that allows multiple move commands to be loaded and then executed. Each entry in the move buffer can contain a unique identifier, independent Speed, Acceleration, Deceleration and Jerk settings. A configurable *Move buffer low* system event will trigger either a Mint routine or ActiveX service which you can customize to refill the buffers. Output transitions states, pulse durations and even dwell times can be loaded into the move buffer to ensure they are synchronous to the axes motion.

Some of the more common motion functions are described below

## Motion Profiles - Positional Moves

Mint offers many flexible move types to suit your application requirements.



Absolute and Relative: With its own speed, acceleration and deceleration defined (including trapezoidal and S-ramp profiles).



Interpolated motion: Using the deep move buffer, multiple linear and circular moves can be blended to create continuous complex motion paths. Intervector angle control allows complex paths to be executed with minimum disturbance. Feedrates and digital outputs can be loaded with each move for complete synchronization.



**Tangential Knife:** Combined with interpolated motion, an axis can be defined as a knife axis and will follow the tangent to any 2D application.



Helical Interpolation: For 3 axes, defining a helical move in 3D space.

**Jog Control:** A function that allows the motor to run indefinitely at a defined speed, in position control.



**Splining:** Allows a stream of moves, defined in terms of position, velocity and time, to be blended for continuous and smooth motion.

## Motion Profiles - Master/Follower

Master follower applications can be geared off any of the encoder inputs, pulse/direction input, virtual axes or from an Ethernet Powerlink encoder.



#### **Electronic Gearbox & Clutch:**

Enables two or more shafts to be linked with a programmable ratio. Any axis can be geared to any other axis. Clutch allows precise start and stop distances when synchronizing.



**Registration on the fly:** Offset moves can be superimposed on geared motion for position correction. This can be triggered from any of the registration inputs or within Mint.



**Electronic CAM:** Replaces traditional mechanical CAMs with servo/vector/stepper motor and software programmable profiles (relative or absolute).



Flying Shear: Allows position synchronization of a slave axis to a master, with defined acceleration and deceleration profiles - all linked by software to product movement.



Virtual Axes: Allows motion to be executed without virtually. Can be used to test applications or as a virtual master for electronic line-shaft applications.



Refer to Catalog BR1202-B for further information on the Mint programming language.



#### Windows<sup>®</sup> Programming via ActiveX<sup>®</sup>

The Mint ActiveX tools provide a toolkit for PC based automation. Use C#, Visual Basic<sup>®</sup> (.NET & VB6), Visual C++ (.NET & VC6), Delphi<sup>™</sup>, LabVIEW or any other ActiveX compliant development tool to implement PC based control of Mint applications. From a simple HMI display, recipe data and machine diagnostics, through to the calculation of multi-axis trajectory data and streaming of data to the NextMove controller.

The Mint ActiveX control shares a common Application Programming Interface (API) with the Mint language. The same keyword in Mint can be found within the ActiveX library making migration of programs simple, reducing the learning curve when developing in different languages. In addition to providing access to the Mint commands, the ActiveX control provides access to diagnostics, events, system configuration and maintenance features such as firmware and program download.

### **Application Development Tools**



#### Monitoring Diagnostic and Debugging Tools

The 'SPY' window provides a number of simple monitoring and test features organized into tabs. The default tab shows useful axis status information and allows the user to select the axis to monitor. Other tabs include the following features :

- > Peer to Peer Comms data exchange
- ) DPR (Dual Port Ram) for PCI products
- > CANopen network status
- > Fieldbus monitoring

- Monitor window with 6 user configured readouts
- ) I/O status monitor

#### Mint<sup>®</sup> WorkBench

Mint WorkBench is a Windows front end which provides a single commissioning and development tool across Baldor's range of NextMove motion controllers, servo drives and vector drives. Mint WorkBench offers an easy to use Windows development front end for Mint programming, with its color highlighting of keywords and context sensitive help. The Program Navigator makes it a breeze to navigate the source code, no matter how complicated.

#### Features include:

- > One tool for all Baldor motion and servo drives
- > Network and drive configuration
- Program Navigator for rapid program development
- Mint code library for re-use of commonly used Mint code sections
- > Full debug capabilities with breakpoints and variable watch
- Spy window to monitor common motion variables and I/O
- Software oscilloscope eases tuning and diagnostics
- > Watch window for variable and task monitoring
- Command line interface to interrogate the controller even when the program is running
- > SupportMe function with automatic e-mail generation for rapid technical support
- > Web updates of firmware within Mint WorkBench
- > Easy management of firmware files

# HPGL – Low Cost, Industry Standard Interpolation

HPGL (Hewlett Packard Graphics Language) is an open standard that describes 2D vectored drawing and is typically used in plotters. With many CAD and drawing applications offering HPGL output, Baldor's HPGL interpreter is ideally suited for low cost XY and 2.5D applications such as pen plotters, routers, engravers and knife cutters.

### **Standard Commands**



Baldor's HPGL interpreter is able to take standard commands sent over the serial interface (including USB, PCI-bus and Ethernet) and interpret these in real-time. Commands in HPGL allow straight lines, circles and rectangles to be executed.

## **Fast Profiling**

Full use is made of Mint's move buffer to provide fast and accurate profiling. Features such as intervector angle allow Mint to make decisions about when to slow down or stop for corners. Feedrate control allows the machine speed to be controlled by the operator using, for example, an analog pot.

## Mint - Power and Flexibility

Baldor's HPGL interpreter is written in Mint, demonstrating not only the power and flexibility of the programming language, but also providing a fully customizable solution. The HPGL interpreter is available as Mint source code and can be tailored to suit applications such as:

- Routers and engravers with different Z depth
   Pen plotters
- > Knife cutting with tangential knife control
- > Glue laying
- And more ...

The HPGL interpreter is supported on all NextMove controllers and is available to download from the Baldor motion website **www.baldormotion.com**.

# Mint<sup>®</sup>NC – CAD to Motion

- > HPGL, DXF and G-Code to motion
- > No graphic or CNC programming language to learn
- > Offline mode for planning and object ordering
- Graphical interface allowing re-ordering of geometry
- Machine control panel for direct machine control
- > Interfaces to NextMove motion controllers



Mint®NC is a comprehensive front end for XYZ type applications, such as plotters, laser cutters, glue laying and routers. Full control of any job is provided both on and offline.

Using the machine control front end, full machine control is possible, allowing axes to be homed and jogged to new positions. Alternatively, Mint<sup>®</sup>NC can be used to translate different CAD and CNC formats to Mint code which can be executed directly on the motion controller.

Machine configurations are easily dealt with using Mint. This acts as a scripting language for complete machine configuration. Whether a start-up sequence or new tool sequence is required, Mint provides complete control over I/O and motion. **Customization through ActiveX** 

Where a simpler operator interface is required, a developer's library is available using ActiveX technology. This allows custom front ends to be quickly and easily realized in applications such as Visual Basic and Visual C++.

MintNC interfaces directly to the NextMove controller through either the USB or PCI interface.

A demonstration version of MintNC is available to download from the Baldor motion website **www.baldormotion.com.** 

# **NextMove**

# **Real-Time Ethernet Motion Controller**

- > Ethernet Powerlink integrated hub
- > 16 axes of interpolated motion
- Control many Ethernet devices including drives, I/O and encoders
- CANopen network manager for low cost expansion
- > RS232/485 and USB communications
- > Multitasking Mint<sup>®</sup> or ActiveX programmable

The NextMove e100 builds on the proven NextMove controller family and now integrates management of a real-time Ethernet network. Drives, I/O devices, sensors, absolute encoders and more can be added to the Powerlink network and controlled from the Mint programming language. This greatly simplifies system design and installation, and simultaneously expands the capabilities of the NextMove e100 as a machine control platform.

## Interpolation on 16 Axes

NextMove e100 can perform interpolation on 16 axes, as either a single coordinate group or as multiple coordinate systems operating independently, with their own scale factors and move buffers. Alternatively all 16 can operate as independent axes.

### Manage many more Positioning Drive Axes

Many devices can be connected on Ethernet Powerlink. DS402 positioning drives, such as the MicroFlex e100 provide additional axes of control. These additional axes provide simple point to point motion, homing sequences, jog control and torque demand functions. Examples include guide axes, indexers, conveyors, tension rollers etc.

# Technical Data

Number of Axes	16 interpolated axes in single or multiple coordinate groups. Manage dozens of independent DS402 positioning drives (non interpolated)
Axis Type	ETHERNET Powerlink (EPL) v2 3 off closed loop axes ±10v interface with 5V TTL incremental encoder inputs 4 off open loop axes - Stepper interface (Step & Direction outputs) 5V differential line driver (Darlington) (5MHz) or 5V open collector single ended (500KHz max) selected by order option
Powerlink Device	EPL DS401 I/O devices for I/O expansion EPL DS402 Positioning Drives such as MicroFlex e100 EPL Absolute Encoders Number of nodes limited only by memory Contact Baldor for information on additional 3rd party products supported.
Ethernet	Specification: 100Mbit - IEEE802.3u compliant Protocol : Ethernet Powerlink V2 (EPL) and IP protocols TCP/UDP Interface : Integrated 2 port Hub for daisy chain connection Cable type : CAT5e Shielded cable, RJ45 connectors, Max 100m(330ft) each. Address: 2 off rotary HEX switches sets node and private device IP address
On-Board Memory	4MByte Flash for firmware and non-volatile program storage. 10MByte SRAM 32kByte FRAM for non-volatile variable data storage
Digital Inputs	20 opto-isolated 24VDC. 1mS sample rate. All inputs Interrupt capable. May be connected positive or negative common (for use with NPN or PNP output transistors) Software configurable for limits (forward and reverse), home, stop and drive error
Fast Inputs	The first 4 of digital inputs can be configured for high speed position capture of axis position 1 ysec capture time



**POWERLINK** real-time technology

ETHERNET



## Integrated Two Port Ethernet Hub

Connecting multiple devices on the Ethernet network is simplified by an integrated 2 port hub. Simply daisy chain the connection to the next device in the system.

#### TCP/IP Communications via ActiveX®

In addition to the deterministic mode of Ethernet Powerlink, the NextMove e100 can also operated in an open mode, using TCP/IP messaging. This features is supported by Baldor's Mint ActiveX tools, which can provide control of a network of drives from a Windows based PC. In this mode the Ethernet interface acts as a standard TCP/IP network port.

# **Ordering Information**

Catalog Number	Description
NXE100-16xxDB	NextMove e100 - 8,12 or 16 Axis motion controller: Differential stepper outputs
NXE100-16xxSB	NextMove e100 - 8,12 or 16 Axis motion controller: Single ended open collector stepper outputs for use with DSM integrated stepper/driver motors
CBL001-501	RS232 serial cable Note: 2m (6.6ft) USB cable supplied
xx = 08, 12, or 16 fo	r number of supported axes

See page 20 for the complete Product Ordering Information.

## State of the Art Design

The e100 family utilizes a separate processor to deal with all communications requirements, leaving the main Digital Signal Processor (DSP) to handle time critical motion tasks. A Field Programmable Gate Array (FPGA) core provides flexibility of design allowing updates to hardware to be issued by firmware and not fixed in design as they would be with ASICs or any other discrete logic devices.

Digital Outputs       12 opto-isolated 12-24VDC PNP         Software configurable for drive enable       50mA typical per channel, 350mA max load for single channel up to 500mA total for 8 channels		
Relay Output         Single output for drive enable. Form C (SPDT) relay rated at 24V (150mA)           Common, normally open, normally closed. Fail safe operation-relay de-energized on an error.           Function defined in Mint		
Analog Outputs	3 outputs for drive command signals. ±10V, 12-bit resolution 1 general purpose ±10V 12-bit output	
Analog Inputs	g Inputs 2 off differential ±10V operation 12 bit resolution.	
Serial Port	User selectable RS485/232 via 9 pin Sub-D. Maximum baud rate 115,200 USB1.1 (12Mbit/sec) supported on Windows 2000/XP/Vista. A 2m (6.6ft) cable is supplied	
CANbus Port	Single CAN port via standard 9 pin Sub-D connector. CANopen DS301: Support for CANopen DS401 I/O devices, Master functionality for peer-to-peer communications with other Mint nodes DS402 Positioning drives management	
Power Requirements	equirements 24VDC ±10% : 70W	
Environmental Limits	Limits Operating Temperature 0°C to 45°C (32°F to 113°C)	
Weight	0.85Kg (1.87 lbs)	
Dimensions	L 262mm (10.3") : W 135mm (5.32") : H 45mm (1.77")	
Programming Mint <sup>®</sup> - Multitasking Motion Basic. Windows 9X/NT/2000/XP/Vista (32-bit only) via ActiveX control All Windows ActiveX libraries supplied free of charge.		

#### Refer to catalog BR1202-I for full information on Baldor's real-time Ethernet Solution

# **NextMove ESB-2**

# **Flexible Machine Controller**

- > 3 or 4 axes of closed loop control plus 4 axes of open loop control
- > 1 or 2 auxiliary encoder channels for following position verification
- > Onboard digital and analog I/O
- > CANopen for distributed control
- > RS232/485 and USB communications
- > Multitasking Mint<sup>®</sup> or ActiveX programmable



NextMove ESB-2 is an economic stand-alone motion controller, running multitasking Mint programs, for up to 4 axes of closed loop control (servo/vector) and 4 axes of open loop control (step/dir outputs). Application versatility is boosted by onboard I/O and a CANbus interface for implementing PLC-style machine control functions.

## **Complete Machine Control**

NextMove ESB-2's complement of onboard digital and analog I/O allows the controller to be employed as a complete machine controller. In many cases this eliminates the need for an external PLC or other host device. The I/O can be expanded easily by means of the controller's CANbus port. CAN I/O devices using the standard CANopen protocol, industry standard DS401 CAN analog and digital I/O can be used.

The controller's low profile form factor and two part screw terminal connectors makes it simple to wire into a control

panel. The onboard USB port is easily accessible for system setup and configuration providing a fast and reliable connection to the PC.

## **Stand-alone Operation**

Onboard flash memory and NextMove's Mint programming capabilities allow the controller to be operated stand-alone without the need for an external PLC or PC. The onboard communications channels, including RS232/485, CANopen and USB make it easier to interface to these devices should the application dictate. A simple ASCII protocol allows data transfer between the host and the NextMove controller.

Number of Axes	Option of 3 or 4 closed loop axes plus 4 open loop axes	
Axis Type	Closed loop servo/vector: PID with velocity and acceleration feed forward terms. 100usec update Open loop: step/direction. 500kHz max. frequency. Differential or 5V open collector option available	
Position Feedback	Servo/Vector: Incremental encoder: RS422 differential AB signals with index (Z) pulse. 20MHz max. frequency Can be used as a master position reference for following applications	
Auxiliary Encoders	2 available with 3 axis closed loop variant - 1 available with 4 axis closed loop variant. Can be used for position following, position verification or dual encoder feedback	
On-board Memory	2MByte Flash for firmware and program storage. 2MByte SRAM. 32kBytes FRAM for parameter storage	
Connector Types	Two part screw terminals and D-type connectors	
Digital Inputs	20 opto-isolated 24VDC. 1 ms sample rate May be connected to positive or negative common (for use with NPN or PNP output transistors) Software configurable for limits (forward and reverse), home, stop and drive error	
Fast Position Latch Inputs	tch Inputs The first 4 of digital inputs can be configured for high speed position capture of axis position 1 yeec capture time	
Digital Outputs	Digital Outputs         12 opto-isolated 12-24VDC PNP. Software configurable for drive enable           50mA per channel, 350mA max source per channel, 500mA max for 8 channels	
Relay Output	Relay Output         Single output for drive enable. Form C (SPDT) relay rated at 24V (150mA)           Common, normally open, normally closed. Fail safe operation-relay de-energized on an error	

# ) Technical Data

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### **Flexible Programming**

Programming flexibility is further enhanced with the ability to develop Windows applications using the supplied ActiveX<sup>®</sup> control. The ActiveX control allows motion and I/O sequencing to be performed in any Windows programming tool, such as Visual Basic.

#### **Closed Loop Control**

Servo and vector axes are controlled from the industry standard  $\pm 10V$  analog outputs and encoder feedback. The NextMove ESB-2 has a fast 6 term PID loop for fine control of the servo axes.

NextMove ESB-2 is ideally matched with Baldor's FlexDrive-II and MicroFlex<sup>™</sup> range of servo drives, BSM servo and linear motor ranges for a complete servo control system.

### **Open Loop Control**

Open loop axes can be controlled from any of the four step and direction outputs. The step/direction outputs can also be used to interface to Baldor's FlexDrive-II or MicroFlex<sup>™</sup> servo drives, which combined with the 3 or 4 closed loop axes, can give up to 8 axes of servo control.

Baldor's range of DSMS integrated stepper motors/drivers are ideally suited for use with NextMove ESB-2. The DSMS motor/driver combination requires only power and pulse/direction in order to operate.

# **Ordering Information**

Catalog Number	Description
NSB202-501	NextMove ESB-2 controller with USB. 3 closed loop axes. 4 open loop differential axes. RS232
NSB202-502	NextMove ESB-2 controller with USB. 3 closed loop axes. 4 open loop differential axes. RS485
NSB203-501	NextMove ESB-2 controller with USB. 3 closed loop axes. 4 open loop differential axes. RS232
NSB203-502	NextMove ESB-2 controller with USB. 3 closed loop axes. 4 open loop differential axes. RS485
NSB204-501	NextMove ESB-2 controller with USB. 4 closed loop axes. 4 open loop differential axes. RS232
NSB204-502	NextMove ESB-2 controller with USB. 4 closed loop axes. 4 open loop differential axes. RS485
NSB205-501	NextMove ESB-2 controller with USB. 4 closed loop axes. 4 open loop differential axes. RS232
NSB205-502	NextMove ESB-2 controller with USB. 4 closed loop axes. 4 open loop differential axes. RS485

See page 20 for the complete Product Ordering Information.

Analog Inputs	2 differential inputs. ±10V operation. 12-bit resolution	
Analog Outputs	3 or 4 outputs for drive command signals. ±10V, 12-bit resolution L general purpose ±10V 12-bit output - 3 axis servo variant only	
Serial Port	RS232 via 9-pin D-type. Maximum Baud rate 115,200 Optional RS485 port via 9-pin D-type USB 1.1 (12 Mbit/sec) supported by Windows 2000/XP/Vista. A 2m (6ft) USB cable is supplied	
CANbus Port	Single CANopen port via RI45 connector. CANopen DS301: Support for CANopen DS401 I/O devices Master functionality for peer-to-peer communications with other Mint nodes Maximum of 63 nodes supported on the network	
Power Requirements	+24VDC ±10% - 70W	
Environmental Limits	ental Limits Operating temperature 0°C to 45°C (32°F to 113°F)	
Weight 0.85kg (1.87 lbs.)		
Dimensions	L: 262mm (10.31"). W: 135mm (5.32"). H: 45mm (1.77")	
Programming	Mint® - Multitasking Motion Basic Windows 9X/NT/2000/XP/Vista (32-bit only) via ActiveX control All Windows ActiveX libraries supplied free of charge	

# **NextMove PCI-2**

- > 1-8 axis PCI-bus servo/stepper loop motion controller
- Fast floating point processor
- Onboard digital and analog I/O >
- **CANopen for distributed control** >
- High speed PCI bus interface >
- Multitasking Mint<sup>®</sup> or ActiveX programmable >

NextMove PCI-2 is a high performance PCI card motion controller for 1 to 8 axes of open (stepper) or closed (servo/vector) loop control providing high speed interpolation between all axes, or synchronization with an external master encoder.

The motion control capability is based on a high-performance DSP core running the latest multitasking version of the Mint® language. An onboard complement of digital I/O and analog I/O allows NextMove PCI-2 to be employed for machine control, eliminating the need for a separate I/O controller such as a PLC. The onboard I/O can be easily expanded by means of the controller's CANopen port, supporting DS401 CANopen I/O devices.

## **High Speed PC Interface**

NextMove PCI-2 provides a high speed data interface between the motion controller and PC by means of Dual Port RAM (DPR). With 16kBytes of shared memory, this can be used for high speed data transfer. Reserved locations within DPR are used to provide diagnostic information such as axis position and error codes and are instantly accessible.

### Industry Standard Interface

Servo or vector axes are controlled from the industry standard ±10V analog outputs (16-bit) and encoder feedback. Stepper axes are controlled through pulse and direction outputs. Axes can be mixed in any application.

Number of Axes	1-4 axes of servo/vector and stepper on each NextMove PCI-2 card.
Axis Type	Closed Loop: (servo/vector), PID with velocity and acceleration feedforward terms. 100usec update rate for 4 axes Open Loop: Stepper with differential step and direction outputs to 3MHz
Position Feedback	4 channels of incremental encoder: RS422 differential AB signals with index (Z) pulse 10MHz max frequency
On-board Memory	2MBytes high speed SRAM for firmware, program storage and user data 32kBytes NVRAM (12kBytes available for parameter storage)
Connector Types	100-pin high density connector. Breakout board available with screw terminals and D-type connectors
Digital Inputs	20 opto-isolated 24V. 1ms sample rate May be connected to positive or negative common (for use with NPN or PNP output transistors) Software configurable for limits, home, stop and drive error
Fast Position Latch	4 inputs for high speed position capture of axis and master encoder positions Assigned from the 20 digital inputs. ( $1\mu sec$ capture time per input
Digital Outputs	12 opto-isolated 12-24V PNP (Darlington) or NPN (FET) outputs Software configurable for drive enable 50mA per channel, 350mA max source per channel, 500mA max for 8 channels
Relay Output	Single output for drive enable. Form C (SPDT) relay rated at 24V (150mA) Common, normally open, normally closed. Fail safe operation: relay de-energized on an error
Analog Inputs	4 differential inputs 12-bit resolution ±10V operation with second order Butterworth filter (cut off frequency of 1kHz)

## **Technical Data**





# **Ordering Information**

Catalog Number	Description
PCI201-501 (-511)	NextMove PCI 1 axis servo/stepper controller PNP outputs (-NPN)
PCI201-502 (-512)	NextMove PCI 2 axis servo/stepper controller PNP outputs (-NPN)
PCI201-503 (-513)	NextMove PCI 3 axis servo/stepper controller PNP outputs (-NPN)
PCI201-504 (-514)	NextMove PCI 4 axis servo/stepper controller PNP outputs (-NPN)
PCI201-508 (-518)	NextMove PCI 8 axis (4 servo + 4 stepper) controller. PNP outputs (-NPN)
PCI003-502	Breakout board
CBL021-501	1m (3ft) 100-pin cable (for use with controller and breakout)
CBL021-502	1.5m (4.9ft) 100-pin cable
CBL021-503	3m (9.8ft) 100-pin cable

See page 20 for the complete Product Ordering Information.

#### Flexible Axis Configuration

NextMove PCI-2 is available in axis variants from 1 through to 4 axes, or as an 8 axis variant, to suit the application. A 4 axis NextMove PCI-2 will allow control of up to 4 axes, servo or stepper. The 8 axis NextMove PCI-2 provide controls all 8 on-board axes - 4 servo and 4 stepper.

#### **Breakout Board eases Wiring**

The optional breakout board connects to the NextMove PCI-2 via a 100-way cable (available in lengths up to 3m/9ft) and provides screw terminal connectors the I/O and D-type connectors for the encoder signals.



Analog Outputs	nalog Outputs     4 outputs for drive command signals. ±10V, 16-bit resolution. Programmable sign bit       Programmable for 16, 14 and 12-bit operation.	
Master Encoder	Aster Encoder         One channel for synchronization and following applications           Incremental encoder: RS422 differential AB signals with index (Z) pulse. 20MHz max frequency	
Communication Interface	33MHz PCI bus 16kByte memory mapped Dual Port RAM (DPR) with interrupt capability	
CANbus Port	Single CANopen port via RI45 connector. CANopen DS301. Support for CANopen DS401 I/O devices Master functionality for peer-to-peer communications with other Mint nodes Maximum of 63 nodes supported on the network	
Power Requirements	+3.3V @1A +5V @ 350mA (additional current required when powering the encoders from the +5V supply) ±12V @ 250mA 15W power consumption	
Environmental Limits	Operating temperature 0°C to 40°C (32°F to 104°F) ambient	
Weight	0.31kg (0.67lb.)	
Dimensions	Short PCI card (7")	
Programming	Mint <sup>®</sup> - Multitasking Motion Basic Windows 9X/NT/2000/XP/Vista (32-bit only) via ActiveX control All Windows ActiveX libraries supplied free of charge	

# **NextMove ES**

# Intelligent 6-Axis Machine Controller

- > 6-axis stand-alone stepper and servo motion controller
- > Fast floating point processor
- > Onboard digital and analog I/O
- > CANopen for distributed control
- > Mint<sup>®</sup> or ActiveX programmable
- > RS232/485 and USB communications
- > Eurocard rack format



NextMove ES is an economical rack mounted motion controller, running the multitasking Mint motion language programs, for up to 2 axes of servo/vector and 4 axes of steppers . Application versatility is boosted by onboard I/O and a CANbus interface for implementing PLC-style machine control functions.

NextMove ES's complement of onboard digital and analog I/O allows the controller to be employed as a complete machine controller, in many cases eliminating the need for an external PLC or other host device. The I/O can be expanded easily by means of the controller's CANbus port. CAN I/O devices are available from Baldor or alternatively, using the standard CANopen protocol, industry standard DS401 CAN analog and digital I/O can be used.

## **Industry Standard Interface**

Servo and vector axes are controlled from the industry standard  $\pm 10V$  analog outputs and encoder feedback. The NextMove ES has a fast 6 term PID loop for fine control of the servo axes.

NextMove ES is matched ideally to the EuroFlex servo drive. EuroFlex<sup>™</sup>, a rack mount EuroCard format drive can sit alongside any NextMove ES controller within a standard rack mount chassis.



EuroFlex rack mount servo drive.

Number of Axes	6 total: 2 servo/vector, 4 stepper	
Axis Type	Servo/Vector: PID with velocity and acceleration feedforward terms. 100µsec update rate for 2 axes Stepper: pulse and direction. 500 kHz max frequency. 5V open collector Darlington	
Position Feedback	back Servo/Vector: Incremental encoder: RS422 differential AB signals with index (Z) pulse. 20MHz max frequency Can be used as a master position reference for following applications	
On-board Memory	2MByte Flash for firmware and program storage 2MByte SRAM. 32kBytes FRAM (non-volatile RAM) for parameter storage	
Connector Types	96-pin DIN41612 Optional breakout board with two part screw terminals and D-type connectors	
Digital Inputs	20 inputs. 5V TTL 1ms sample rate Opto-isolated backplane available May be connected to positive or negative common (for use with NPN or PNP output transistors) Software configurable for limits, home, stop and drive error	
Fast Position Latch	First 4 of digital inputs can be configured for high speed position capture of axis positions $<1\mu\text{sec}$ capture time	
Digital Outputs	12 opto-isolated. 5V open collector Darlington. Opto-isolated backplane available Software configurable for drive enable 50mA per channel, 350mA max source per channel, 500mA max for 8 channels	
Relay Output	Single output for drive enable. Form C (SPDT) relay rated at 24V (150mA) Common, normally open, normally closed. Fail safe operation: relay de-energized on an error	

# **Technical Data**



### **Open Loop Control**

Stepper and open loop axes can be controlled from any of the four step and direction outputs. The stepper outputs can also be used to interface to Baldor's FlexDrive-II and MicroFlex™ drives. Alternatively, Baldor's range of integrated stepper motor/drivers, the DSM series, can be used.

#### **Fast PC Communications**

NextMove ES's USB interface provides a fast and reliable connection to the PC. An RS232 or optional RS485 port is available for connection to PLCs and HMI units, in addition to the PC.

#### **Choice of Backplanes**

A choice of backplanes are available for use with NextMove ES. These provide two part screw terminals for the logic signals and 9-pin D-type connectors the encoder signals. Backplanes are available with and without opto-isolation.

NextMove ES's 96-pin connector is fully documented to allow development of custom backplanes.



# **Ordering Information**

Catalog Number	Description
NES002-501	NextMove ES controller with USB and RS232
NES002-502	NextMove ES controller with USB and RS485
BPL010-501	Non-isolated backplane
BPL010-502	Isolated backplane PNP
BPL010-503	Isolated backplane NPN
CBL001-501	RS232 serial cable Note: 2m (6.6ft) USB cable supplied

See page 20 for the complete Product Ordering Information.

Analog Inputs	
Analog Outputs	
Pulse/Direction Input	
Serial Port	
CANbus Port	
Power Requirements	
Environmental Limits	
Weight	
Dimensions L: 160mm (6.30"); H: 100mm (3.94")	
Programming         Mint® - Multitasking Motion Basic           Windows 9X/NT/2000/XP/Vista (32-bit only) via ActiveX control         All Windows ActiveX libraries supplied free of charge	

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# **Product Overview**







	NextMove e100	NextMove ESB-2	NextMove PCI-2	NextMove ES
Physical Format	Panel Mount	Panel Mount	PCI	EuroCard
Number of Axes	16 (1)	7 or 8	1 - 8	6
Servo/Vector Axes (Closed Loop)	3 (±10V) 16 (Powerlink)	3 or 4	1 - 4	2
Stepper Axes (Open Loop)	4	4	1 - 4	4
Processor Speed	120 MHz	120 MHz	120 MHz	120 MHz
FLASH Memory	4 MByte	2 MByte	-	2 MByte
User Memory	1 MByte	1 MByte	1 MByte	1 MByte
Battery Backup	No	No	No	No
Non-volatile memory (32 bit words)	4064	4064	3071	4064
Ethernet Powerlink				
Ethernet TCP/IP				
RS232 Ports	User Select	1	0	1
RS485 Ports	User Select	Θ	0	•
USB Ports (12 Mbit/s)	1	1	0	1
CANopen Port				
CANopen DS401 I/O Master				
CANopen DS402 Master				
PCI Interface				
Digital Inputs	20	20	20	20
Opto-isolated	PNP/NPN	PNP/NPN	PNP/NPN	•
High Speed Position Latches (4)	4	4	4	4
Quadrature position counters (7)	0	1	0	1
Digital Outputs	12	12	12	12
Opto-isolated	PNP	PNP	PNP/NPN	•
High Speed Position Compare Outputs (5)	4 (6)	4 (6)	4 (6)	4 (6)
2D Position Compare				
Analog Outputs	4 x 12 bit	4 x 12 bit	4 x 16 bit	4 x 12 bit
Analog Inputs	4 x 12 bit	4 x 12 bit	4 x 12 bit	2 x 12 bit
Relay Outputs	1	1	1	1
Master Encoder Inputs (3)	0 (2)	2 or 1 (6)	1	0
MintNC Supported				
HPGL Supported				

Supported D Not-Supported O Option

(1) Support for up to 16 axes of coordinated motion and many more axes of non-coordinated motion via DS402

(2) Ethernet Powerlink encoders supported (3) Local axis encoder can be configured for use as a master encoder

- (4) Uses first 4 digital inputs for fast position latch
  (5) Uses first 4 digital outputs for fast position compare
- (6) Depends on servo axis configuration
- (7) 3 digital inputs can be configured to count a 24V quadrature signal (ABZ)

# NextMove Accessories

#### **HMI Panels**

Refer to catalog BR1202-H for full information. Baldor's range of programmable HMI panels offers everything from simple text displays through to large color touch screen panels.

- Text displays with 4x20 character displays
- Touch screen displays from mono 3.8" to color TFT 12.1"

All displays are programmable with an easy to use Windows front end, removing the burden of handling the HMI task from the motion controller. Communications to NextMove is via serial or CANopen communications.

### **CANopen Slice I/O**

System I/O can be expanded at any drive or motion controller via the on board CANopen port. The din-rail mount I/O system is configured from a selection of digital and analog I/O slices to suite the application requirements. Special purpose slices are also available.





#### **Encoder Splitter Boards**

Baldor encoder splitter boards take a single encoder input signal (typically from a master encoder) and splits the signal to multiple drives or motion controllers.



#### Cables

A range of cables, both pre-made and raw, are available to match the

NextMove motion controller to Baldor's range of

servo drives. Available in different lengths, the premade cables are fitted with appropriate connectors at both ends, reducing set-up time and costs.

### **Power Supply Units**

Baldor offers a range of 24V power supply units (PSU) that are ideal for powering NextMove controllers and the control electronics of the Baldor servo drives. With a universal 110-240 VAC input, the PSU's are available with current ratings of 3.2A (75W), 5A (120W) and 10A (240W). A 120W unit is capable of powering a single NextMove ESB-2 and 3 MicroFlex servo drives.

# Ordering Information



#### NextMove e100

Catalog Number	Description
NXE100-16xxDB	NextMove e100 - 8,12 or 16 Axis motion controller: Differential stepper outputs
NXE100-16xxSB	NextMove e100 - 8,12 or 16 Axis motion controller: Single ended open collector stepper outputs for use with DSM integrated stepper/driver motors

xx = 08, 12, or 16 for number of supported axes



### **NextMove PCI-2**

Catalog Number	Description
PCI201-501 (-511)	NextMove PCI-2 1 axis servo/stepper controller PNP outputs (-NPN)
PCI201-502 (-512)	NextMove PCI-2 2 axis servo/stepper controller PNP outputs (-NPN)
PCI201-503 (-513)	NextMove PCI-2 3 axis servo/stepper controller PNP outputs (-NPN)
PCI201-504 (-514)	NextMove PCI-2 4 axis servo/stepper controller PNP outputs (-NPN)
PCI201-508 (-518)	NextMove PCI-2 8 axis (4 servo + 4 stepper) controller. PNP outputs (-NPN)
PCI003-502	Breakout unit with two part screw terminals
CBL021-501	1m (3ft) 100-pin cable (for use with controller and breakout)
CBL021-502	1.5m (4.9ft) 100-pin cable
CBL021-503	3m (9 8ft) 100-pin cable



#### **NextMove ESB-2**

Catalog Number	Description
NSB202-501	NextMove ESB-2 controller with USB. 3 closed loop axes. 4 open loop differential axes. RS232
NSB202-502	NextMove ESB-2 controller with USB. 3 closed loop axes. 4 open loop differential axes. RS485
NSB203-501	NextMove ESB-2 controller with USB. 3 closed loop axes. 4 open loop differential axes. RS232
NSB203-502	NextMove ESB-2 controller with USB. 3 closed loop axes. 4 open loop differential axes. RS485
NSB204-501	NextMove ESB-2 controller with USB. 4 closed loop axes. 4 open loop differential axes. RS232
NSB204-502	NextMove ESB-2 controller with USB. 4 closed loop axes. 4 open loop differential axes. RS485
NSB205-501	NextMove ESB-2 controller with USB. 4 closed loop axes. 4 open loop differential axes. RS232
NSB205-502	NextMove ESB-2 controller with USB. 4 closed loop axes. 4 open loop differential axes. RS485



## NextMove ES

Catalog Number	Description
NES002-501	NextMove ES controller with USB and RS232
NES002-502	NextMove ES controller with USB and RS485
BPL010-501	Non-isolated backplane
BPL010-502	Isolated backplane PNP
BPL010-503	Isolated backplane NPN
CBL001-501	RS232 serial cable Note: 2m (6 6ft) USB cable supplied

# Accessories

#### **Programmable HMI Panels**

Refer to catalog BR1202-H for full information.

Catalog Number	Description
KPD-KG420-20	4x20 character text/graphic display with numerical keypad.
KPD-KG420-30	4x20 character text/graphic display with numerical keypad and additional function keys
KPD-KG840-10	8x40 character text/graphic display with alpha- numerical keypad
KPD-TS03M-10	3.8" mono touch screen
KPD-TS05M-10	5.7" mono touch screen
KPD-TS05C-30	5.7" color (TFT) touch screen
KPD-TS05C-30E	5.7" color (TFT) touch screen with Ethernet
KPD-TS10C-30E	10.4" color (TFT) touch screen with Ethernet
KPD-TS12C-30E	12.1" color (TFT) touch screen with Ethernet
KPD-OPTC	CANopen option card

## **Power Supply Units**

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Cables



Catalog Number	Description
DR-75-24	24V Universal
DR-120-24	24V Universal
DRP-240-24	24V Universal

Jniversal Power Supply. 75W/3.2A output Iniversal Power Supply. 120W/5.0A output Iniversal Power Supply. 240W/10A output



## **Encoder Splitter Boards**

**Mint®NC** 

Catalog Number	Description
OPT029-501	4 channel encoder splitter board (DIN rail mount)
OPT029-502	8 channel encoder spliiter board (DIN rail mount)



Catalog Number	Description
MNC001-501	Mint®NC – CAD to Motion Windows front end

Catalog Number	Description	
CBL001-501	RS232 serial cable	
CAN/Ethernet Cab	les	
CLB002CM-EXS	0.2 meter (0.8ft) Shielded	RJ45 Cable
CLB005CM-EXS	0.5 meter (1.6ft) Shielded	RJ45 Cable
CLB010CM-EXS	1 meter (3.2ft) Shielded RJ45 Cable	
CLB020CM-EXS	2 meter (6.5ft) Shielded R	J45 Cable
CLB050CM-EXS	5 meter (16.3ft) Shielded	RJ45 Cable
CLB100CM-EXS	10 meter (32.7ft) Shielder	d RJ45 Cable
drive encoder output position feedback.	caples: Motion feedback ca it signal to the NextMove er Different lengths are availabl	idies connect the icoder input, providing e / <b>ES</b>
CBLxxxMF-E3B	Motion feedback cable	
T	Specify length: <b>005</b> (0.5m <b>015</b> (1.5m/4.8ft); <b>020</b> (2m <b>040</b> (4m/13.1ft); <b>050</b> (5m	n/1.6ft); <b>010</b> (1m/3.2ft); n/6.5ft); <b>030</b> (3m/9.8ft); n/16.3ft)
Series II/MicroFlex	to NextMove PCI-2	
CBLxxxMF-E3A	Motion feedback cable	
T	Specify length: <b>005</b> (0.5m <b>015</b> (1.5m/4.8ft); <b>020</b> (2m <b>040</b> (4m/13.1ft): <b>050</b> (5m	/1.6ft); <b>010</b> (1m/3.2ft); n/6.5ft); <b>030</b> (3m/9.8ft); /16.3ft)

Motor power, motor feedback and raw cables are also available. Please refer to brochure  $\ensuremath{\text{BR1202-H}}$  for further details.

# **Servo Drive Solutions**

Whether you are looking for a simple servo drive or a fully programmable drive, Baldor has the answer. Baldor servo drives have been at the heart of automation for over 20 years and have been used in thousands of applications across the world. Our latest drives build on the reputation of quality and ease of use and are ideally matched to Baldor's range of NextMove motion controllers, rotary servo motors and linear servo motors. Commissioning and setup use the same acclaimed Mint<sup>®</sup> WorkBench Windows tool as the NextMove controllers, reducing the learning curve and improving productivity.





#### **MicroFlex™**

#### Refer to catalog BR1202-D for full information.

Baldor's MicroFlex is a compact brushless servo drive capable of powering either rotary or linear motors, and is available in single phase 110-230VAC 50/60Hz or 3 phase 230VAC operation in current ratings of 3, 6 and 9 amps. Feedback is software programmable, accepting encoder, SSI (Synchronous Serial Interface) or Hall-effect sensors. Resolver feedback is available as an option. The MicroFlex e100 offers a fully digital solution utilizing Ethernet Powerlink to reduce wiring between the drive and motion controller (NextMove e100), increasing reliability and improving set-up time.



#### FlexDrive-II, Flex+Drive®-II and MintDrive®-II

#### Refer to catalog BR1202-D for full information.

Baldor's Series-II servo drives offer high performance control of both rotary and linear brushless servo motors. This fully featured drive family offer different feedback options (resolver, incremental and absolute multi-turn encoders) and fieldbusses (CANopen, DeviceNet and Profibus-DP). Models are available with single phase 115/230VAC (2.5 to 7.5A) or universal three phase 180-460 VAC (2.5 to 27.5A) inputs.

The FlexDrive-II is a servo drive for connection to a motion controller or PLC accepting the industry standard ±10V analog interface. The Flex+Drive-II is a versatile indexing drive. In addition to setting position or speeds within a simple Windows front end, Flex+Drive-II is programmable in a single tasking version of Baldor's motion language, Mint<sup>®</sup>. The MintDrive-II provides the ultimate solution for single axis applications. Support the acclaimed multitasking version of Mint, MintDrive-II is ideally suited for following type applications requiring cam profiles, flying shears or positional offsets.



#### MotiFlex<sup>™</sup> e100

#### Refer to catalog BR1202-I for full information.

Baldor's MotiFlex<sup>™</sup> e100 is new range of high performance multi-axis drives providing a single platform for drive solutions for automation. MotiFlex integrates state of the art DSP technology specifically designed for motor control, with a real-time Ethernet Powerlink platform, modular construction and Baldor's Mint<sup>®</sup> motion control technology. With universal AC operation and current ratings from 1.5 to 33.5 Amps in two package sizes, MotiFlex has software selectable Servo or AC vector modes and will suit both rotary and linear motor control. With complete flexibility in mind, the RoHS compliant design includes a universal encoder interface and 2 expansion slots for fieldbus, digital and analog I/O, additional feedback devices, motion controllers and safety devices.

#### **Euroflex**

#### Refer to catalog BR1202-D for full information.

A compact rack mount servo drive, EuroFlex offers the same ease of use and flexibility as the MicroFlex servo drive. With an encoder feedback is suitable for both rotary and linear servo motors, the industry standard ±10V command interface makes it compatible with any motion controller or PLC on the market today. EuroFlex's rack mounted format makes it the ideal partner for NextMove ES multi-axis motion controller. EuroFlex is available with a current rating of 5A (15A peak) and 80VDC/56VAC input.

# **Motor Solutions**

For over 20 years, Baldor has been manufacturing and supplying high reliability servo motor solutions to worldwide applications. Baldor's servo motors are designed for industrial applications, superior durability and proven reliability. Our range of rotary motors are available as a high performance, low inertia family, or as a higher inertia family for more cost effective applications. Baldor's new stainless steel motors lead the way in solutions for harsh and washdown environments.

With the widest range of linear motors and stages on the market today, Baldor's linear motors lead the way and are ideally suited to applications requiring higher speeds or improved accuracy.

## **BSM Series Servo Motors**

#### Refer to catalog BR1202-E for full information.

BSM motors are hard at work, increasing productivity, improving part quality, providing precision and reducing costs in many applications. These motors are available in two models, the BSM N-Series and the BSM C-Series. The N-Series motors provide low inertia for the highest performance. The C-Series motors have a higher inertia, with a cost effective design. All the motors are available with different feedback options including resolver, encoder (2500ppr standard), BiSS (single and multi-turn) and EnDat. Motors are available from 0.1 Nm (4 lb.-in) through to 134 Nm (1,185 lb.-in).

Both motor families are available in a stainless steel configuration, offering the best protection for harsh environment. These motors are ideally suited for pharmaceutical and food applications.



#### Linear Motors and Stages

#### Refer to catalog BR1202-G for full information.

Used in thousands of applications worldwide, Baldor provides industry with the widest range of linear motors and linear stages. Linear motors provide unique speed and positioning performance advantages. The direct-coupled motion eliminates mechanical transmission devices and offer substantial improvements over applications using ball screws, timing belts, etc. The rugged mechanical design provides accurate motion and precision positioning for millions of cycles.



#### **DSM - Integrated Stepper Motor and Drive**

#### Refer to flyer FL1851 for full information.

Baldor's new DSM integrated stepper motor and microstepping drive provides a cost effective solution for stepper motor applications. The unique design integrates a high performance micro-stepping drive onto a stepper motor, providing a compact and reliable solution. Wiring is reduced to just pulse and direction plus power. The range is available in NEMA frames sizes 17, 23 and 34 with torque outputs from 22 to 748 N-cm (32 to 1061 oz-in)



## **DC Servo Motors**

#### Refer to catalog BR1202-F for full information.

The Baldor family of DC servo motors (PMDC) provide continuous torques from 0.21Nm to 6.55Nm (1.8 lb.-in to 58 lb.-in.) These high performance motors are designed to meet the demanding requirements of industrial motion control. A wide variety of windings and feedback devices are available for your application needs.





### **Baldor's Motion Solutions Catalogs**

BR1202-A	Motion Control Solutions
BR1202-B	Mint <sup>®</sup> Software and Applications
BR1202-C	NextMove Multi-Axis Motion Controllers
BR1202-D	AC Servo Drives
BR1202-E	AC Servo Motors
BR1202-F	DC Servo Motors and Drives
BR1202-G	Linear Motors and Stages
BR1202-H	Motion Product Accessories
BR1202-I	Real-Time Ethernet Motion Solutions

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