

## NextMoveBX<sup>II</sup>

Standalone 2-4 Axis Machine Controller

- 2-4 axis standalone servo motion controller
- High speed DSP processor
- Onboard digital and analog I/O
- CAN for distributed control
- RS232 and RS485 serial interfaces
- Multi-tasking MintMT or 'C' programmable



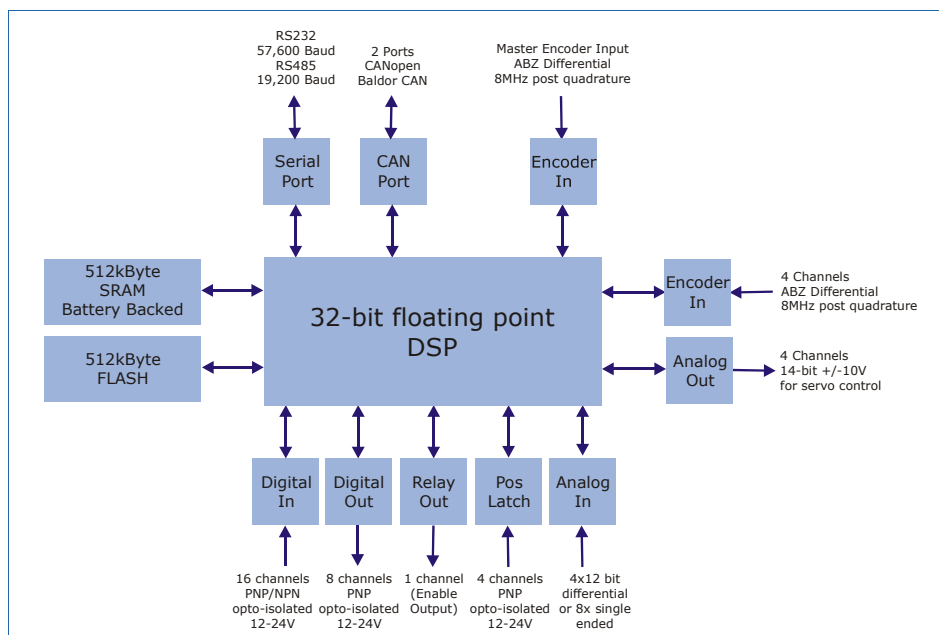
NextMove BX<sup>II</sup> is a high performance standalone motion controller for 2 to 4 axes of servo control providing high speed interpolation between all four axes, or synchronization with an external master encoder or virtual axis.

The motion control capability is based on a high-performance DSP core running the latest multi-tasking version of the Mint language - MintMT. An onboard I/O complement of 16 digital inputs, 8 digital outputs, four 12-bit differential analog inputs, allows users to employ the module for machine control as well - eliminating the need for a separate I/O controller such as a PLC. This I/O may be expanded easily by means of the controller's CANbus ports, supporting both CANopen and Baldor CAN devices.

Servo axes are controlled from the industry standard  $\pm 10V$  analog outputs (14-bit) and encoder feedback. The NextMove BX<sup>II</sup> has a 6 term PIDVFA loop for fine control of the servo axes.

NextMove BX<sup>II</sup> is ideally matched with Baldor's FlexDrive<sup>II</sup> and MicroFlex range of servo controls and BSM servo motor range for a complete servo control system.

Applications include high speed printing, packaging, labeling and machine tools, and common automation needs including robotics, rotary knives and X-Y systems.



## Total Programming Flexibility

Baldor's Mint languages offers total flexibility for the machine designer to satisfy different performance and operational requirements.

Features of MintMT include:

- Subroutines and functions with parameter passing and local variables
- User named variables and arrays
- Multiple, independent tasks limited only by available memory
- Compiled source code for high speed program execution

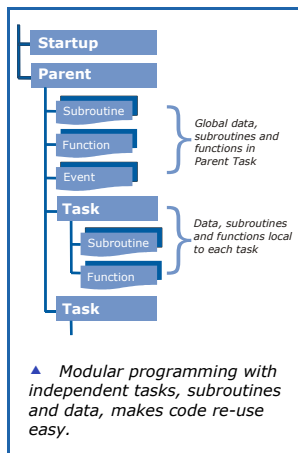
Mint provides flexible Basic-style programming for automation builders which allows motion programs to be developed and tested in minutes. Keywords provide ready-to-use software for movement tasks from simple profiles to advanced profiles such as software cams and flying shears. Also incorporating I/O, HMI and communication functionality, Mint provides a complete automation solution which can run autonomously.

Multi-tasking further simplifies development, allowing complex requirements such as machine control to be divided into small, manageable tasks such as motion, human-machine interfacing, and I/O handling.

## 'C' Programming

For optimum performance, programs can be written in 'C' and embedded for advanced real-time performance via a library of Mint-compatible 'C' language routines. The function library shares the same Application Programming Interface (API) as MintMT and the ActiveX control, making multi-platform development simple, with only one Mint API to remember.

With it's open architecture the 'C' programming libraries even allow for custom motion profilers and control algorithms to be embedded deep within the real time code.



## Motion Profiles—Positional Moves

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

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

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

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

**Speed control:** A jogging function 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, smooth motion.

## Motion Profiles—Master/Follower

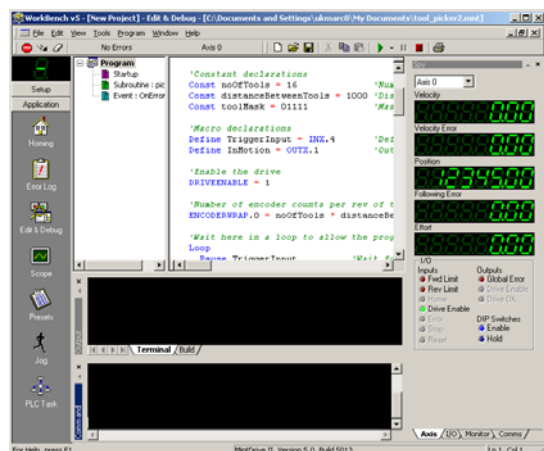
Master follower applications can be geared off any of the encoder inputs, Pulse/Dir input or virtual axes.

**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,** An offset move can be superimposed on the gearing move for position correction. This can be triggered from any of the 4 registration inputs.

**Electronic Cam:** Replaces traditional mechanical cams with servo/vector 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.



## Program Development Tools

The Mint WorkBench is a common Windows front end compatible across of Baldor's range of motion controllers and servo 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:

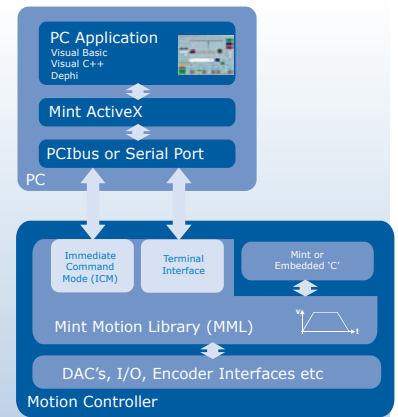
- Command line interface to interrogate the controller even when the program is running
- Spy window to monitor common motion variables and I/O
- Software oscilloscope
- Watch window for variable and task monitoring
- SupportMe function with automatic email generation for rapid technical support
- Web updates of firmware within the WorkBench
- Easy management of firmware files

## ► Windows Programming

Using the supplied ActiveX™ controls, programmers can call high level Mint language functions on the motion controller from popular high-level 'rapid application development' environments for Windows™ such as Visual Basic, Visual C++, Delphi and LabVIEW.

The ActiveX control provides access to all the motion control and I/O functions on the controller, allowing a Windows front end to act as a machine controller. All Mint based events are supported, allowing for example an input to event the executing Windows program. In addition, an ActiveX developed front-end can operate in parallel with a Mint or Embedded 'C' application.

All ActiveX commands share the same Application Programming Interface (API) names as Mint, making it easy to switch between languages on the controller and PC.



## CAN Interface

NextMove BX<sup>II</sup> sports a dual CAN interface conforming to the CANopen specification and Baldor CAN. Available through a standard RJ45 connector, the CANopen interface allows for digital and analog I/O expansion using any available DS401 compliant I/O device. Alternatively, a range of digital CAN I/O devices are available from Baldor conforming to a Baldor CAN protocol. These can be operated from the second CAN channel.

The CANopen port can be used to interface to other Mint controllers, including Baldor's intelligent drives providing the ability to create loosely coupled multi-axis configurations, beyond the 4 axes supported by NextMove BX<sup>II</sup>. Data can be passed easily between connected nodes using the Mint Comms Array. With one node designated as the bus master, nodes can communicate with each other in a full peer-to-peer network.



◀ Peer-to-peer network between NextMove BX<sup>II</sup> and MintDrive. Any of these controllers can be designated as the bus master.

When a Comms location is updated, a user defined event can be called. This allows immediate action to be taken on the data. Data can be passed to individual nodes on the network, or to user defined groups of nodes.



◀ A range of Human Machine Interface (HMI) panels are available from Baldor which can be interfaced via the CANopen port. With Mint's ability to perform motion and I/O tasks simultaneously, NextMove BX<sup>II</sup> is ideally suited as a complete machine controller.

The Mint Comms Array is used to pass data from the HMI panel to the NextMove BX<sup>II</sup> controller.

## Accessories

A range of digital I/O devices are available to expand the I/O capability of the NextMove controller. These DIN rail mounted modules are controlled over the Baldor CANbus. Up to 63 devices are supported on CANbus.

### CAN Expansion 8 Digital Inputs

- 8 Digital opto-isolated inputs
- 12-24V PNP/NPN operation



### CAN Expansion 8 Digital Outputs

- 8 Digital opto-isolated outputs
- PNP operation
- 50mA source on all channels
- 500mA max outputs for 8 channels



### CAN Expansion 8 Relay Outputs

- 8 relay outputs
- Form C (SPDT) relays rated at 0.5A @ 125VAC, 2A @ 30VDC



### CAN Expansion 24 Inputs, 24 Outputs

- 24 opto-isolated inputs (PNP/NPN)
- 24 opto-isolated outputs (PNP)



## Human Machine Interfaces

### CAN Keypad

- Operates over Baldor CAN
- 20 character x 4 line backlit display
- Programmable keys



### Operator Panels

- CANopen and serial bus
- Programmable panels with intuitive software
- Comprehensive range available
- LCD character and 1/4 VGA displays available



## Technical Data:

<b>Number of Axes</b>	2, 3, or 4 servo
<b>Axis Type</b>	Servo, PID with velocity feedback/feedforward and acceleration feedforward terms. 500µsec update rate
<b>Position Feedback</b>	Incremental encoder: RS422 differential AB signals with index (Z) pulse. 8MHz max frequency
<b>On-board Memory</b>	512kBytes Flash for firmware and program storage 512kBytes battery backed SRAM. 256kBytes available for programs
<b>Connector Types</b>	Two part screw terminals and D-type connectors
<b>Digital Inputs</b>	16 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
<b>Digital Outputs</b>	8 opto-isolated 12-24V PNP Software configurable for drive enable 50mA per channel, 350mA max source per channel, 500mA max for 8 channels
<b>Fast Position Latch</b>	4 inputs for high speed position capture of axis and master encoder positions 1x 30µsec input, 3x 1ms inputs Opto-isolated 12-24V
<b>Relay Output</b>	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
<b>Analog Outputs</b>	4 outputs for drive command signals. ±10V, 14-bit resolution. Programmable sign bit
<b>Analog Inputs</b>	4 differential or 8 single ended inputs. Programmable for ±10V, ±5V, 0-10V or 0-5V. 12-bit resolution
<b>Master Encoder</b>	One channel for synchronization and following applications Incremental encoder: RS422 differential AB signals with index (Z) pulse. 8MHz max frequency
<b>Serial Ports</b>	RS232—max. Baud rate 57,600 for programming RS485—max. Baud rate 19,200 for programming and multi-drop communications (32 devices)
<b>CANbus Ports</b>	2 CAN ports via two RJ45 connectors allowing daisy chaining of units CAN-1—CANopen DS301. Support for CANopen DS401 I/O devices Master functionality for peer-to-peer communications with other Mint nodes CAN-2 Baldor CAN. Support for Baldor's range of digital I/O expansion units Maximum of 63 nodes supported on the network.
<b>Power Requirements</b>	+24VDC (850mA)
<b>Environmental Limits</b>	Operating temperature 0°C to 45°C (32°F to 113°F)
<b>Weight</b>	1.35kg (2.98lb.)
<b>Dimensions</b>	H: 312mm (12.38"); W: 58.5mm (2.30"); D: 189.6mm (7.45")
<b>Programming</b>	MintMT—Multi-tasking Motion Basic Embedded 'C'. Texas Instruments compiler must be purchased separately. Windows 9X/NT/2000/XP via ActiveX control All Windows and embedded programming libraries supplied free of charge

## Ordering Information:

Catalog Number	Description
NMX004-501	NextMove BX <sup>II</sup> 2 axis controller
NMX004-502	NextMove BX <sup>II</sup> 3 axis controller
NMX004-503	NextMove BX <sup>II</sup> 4 axis controller
CBL001-501	RS232 serial cable
KPD007-501	4x20 character display HMI
KPD008-501	8x40 graphic and keypad HMI
KPD009-501	5.6" monochrome touch screen HMI
KPD009-502	5.6" color touch screen HMI
OPT032-501	CANopen option card for HMI panels
ION001-501	CAN 8 input expansion module
ION003-501	CAN 8 output expansion module
ION002-501	CAN 8 relay expansion module
ION004-501	CAN 24 input, 24 output expansion mod
KPD002-505	CAN operator panel (4 axes)

Contact Baldor for a complete list of accessories, cables, servo drives and motors.

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## Baldor's Motion Products

Baldor's product range offers powerful solutions for the control of servo and stepper motors, in optimized forms for OEMs and end users. Every controller is compatible with the powerful Mint programming language and development environment for embedded systems/PC applications—boosting development flexibility and speed. Products share a common API—keywords are the same whether programming in MintMT, 'C' or Windows—providing a versatile and cost saving platform for OEMs.

Contact Baldor today for more information on:

- Eurocard rack mounting controllers
- PCibus controllers
- Intelligent servo drives
- Complete enclosed unit - ready to use panel mounting controllers
- Rotary servo motors
- High performance linear motors

Local Distributor: