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BALDOR MOTION PRODUCTS

NextMoveBX^{II}

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

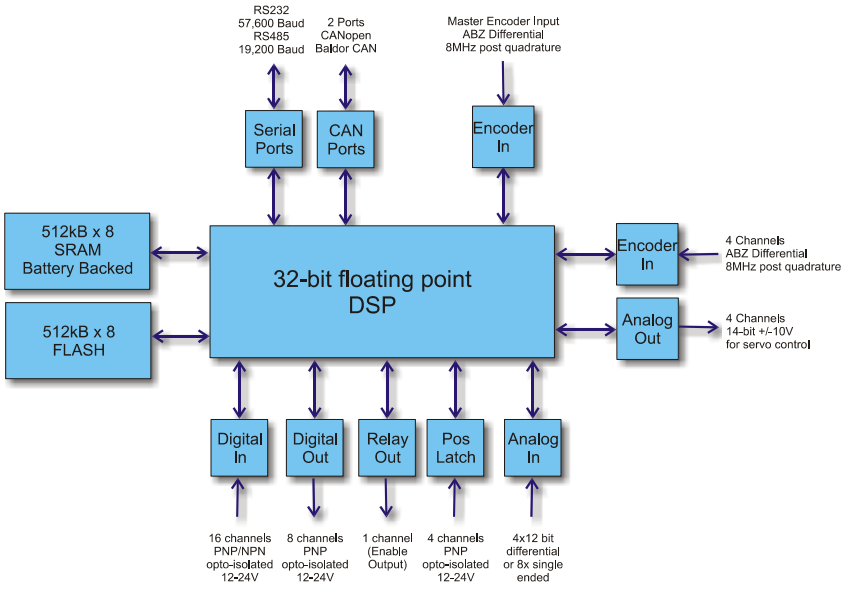
NextMove BX^{II} is a high performance standalone motion controller for 2 to 4 axes of servo control providing high speed interpolation between all four axes, or synchronization with an external master encoder or virtual axis.

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 ±10V analog outputs (14-bit) and encoder feedback. The NextMove BX^{II} has a 6 term PIDVFA loop for fine control of the servo axes.

NextMove BX^{II} is ideally matched with Baldor's FlexDrive^{II} 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.



Our job is making yours easier

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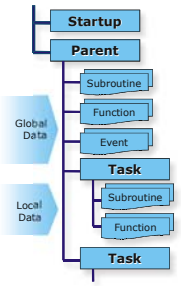
Total Programming Flexibility

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

MintMT

Features of MintMT include:

- Subroutines and functions with parameter passing and local variables
- Named variables and arrays
- Independent tasks limited only by available memory
- Compiled source code for high speed program execution



Modular programming with independent tasks, subroutines and data, makes code re-use even easier.

MintMT 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 and HMI 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, man-machine interfacing, and I/O handling.

Motion Profiles—Positional Moves

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

Interpolated moves: using the 100 deep move buffer, multiple linear and circular moves may be blended for continuous complex motion paths. Each move can be assigned its own feedrate.

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

Electronic Gearbox & Clutch: Enables two or more shafts to be linked with a programmable ratio. Any axis can be geared to any other in addition to the master encoder input. Clutch allows precise start and stop distances when synchronizing.

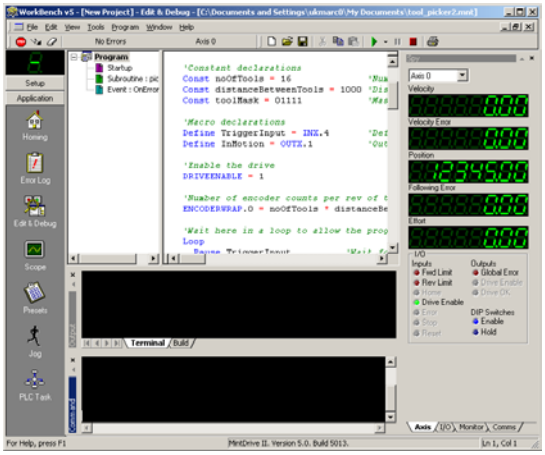
Registration on the fly, An incremental move may be performed during gearing for position correction.

Electronic Cam: Replaces traditional mechanical cams with servo/vector motor and software programmable profiles (relative or absolute). Each axis can support cam profiling.

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 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 interrogating the controller even when the program is running
- Spy window to monitor common motion variables and I/O
- Software oscilloscope
- Watch window for variable monitoring
- SupportMe function for rapid technical support
- Web updates

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'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.

Open architecture even allows for custom motion profilers and control algorithms to be embedded deep within the real time code.

Windows Programming

Using 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.

Different move commands are supported to suit your application.

CAN Interface

NextMove BX^{II} sports a dual CAN interface with one channel conforming to the CANopen DS301 specification. 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.

Baldor Operator Panel for complete machine control

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^{II} is ideally suited as a complete machine controller.

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.

Multi-axis CANopen Network

The second CAN channel, Baldor CANbus, allows the digital I/O to be expanded via cost effective I/O modules.

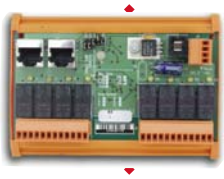
Accessories

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

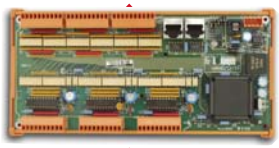
The CAN I/O expansion modules have two part connectors for power and the I/O.

CAN Expansion 8 Digital Inputs
- 8 Digital opto-isolated inputs
- 12-24V PNP/NPN operation
- LED indicator for each input

CAN Expansion 8 Digital Outputs
- 8 Digital opto-isolated outputs
- PNP operation
- 50mA source on all channels
- 500mA max outputs for 8 channels
- LED indicator for each output



CAN Expansion 8 Relay Outputs
- 8 relay outputs
- Form C (SPDT) relays rated at 0.5A @ 125VAC, 2A @ 30VDC
- LED indicator for each output



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

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Technical Data

Number of Axes	2, 3, or 4 servo
Axis Type	Servo, PID with velocity feedback/feedforward and acceleration feedforward terms. 500µsec update rate
Position Feedback	Incremental encoder: RS422 differential AB signals with index (Z) pulse. 8MHz max frequency
On-board Memory	512kBytes Flash for firmware and program storage 512kBytes battery backed SRAM. 256kBytes available for programs
Connector Types	Two part screw terminals and D-type connectors
Digital Inputs	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
Digital Outputs	8 opto-isolated 12-24V PNP Software configurable for drive enable 50mA per channel, 350mA max source per channel, 500mA max for 8 channels
Fast Position Latch	4 inputs for high speed position capture of axis and master encoder positions 1x 30µsec input, 3x 1ms inputs Opto-isolated 12-24V
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 Outputs	4 outputs for drive command signals. ±10V, 14-bit resolution. Programmable sign bit
Analog Inputs	4 differential or 8 single ended inputs. Programmable for ±10V, ±5V, 0-10V or 0-5V. 12-bit resolution
Master Encoder	One channel for synchronization and following applications Incremental encoder: RS422 differential AB signals with index (Z) pulse. 8MHz max frequency
Serial Ports	RS232—max. Baud rate 57,600 for programming RS485—max. Baud rate 19,200 for programming and multi-drop communications (32 devices)
CANbus Ports	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.
Power Requirements	+24VDC (850mA)
Environmental Limits	Operating temperature 0°C to 45°C (32°F to 113°F)
Weight	1.35kg (2.98lb.)
Dimensions	H: 312mm (12.38"); W: 58.5mm (2.30"); D: 189.6mm (7.45")
Programming	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

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
- Multi-axis stepper controller and drive
- Rotary and linear servo motors

Ordering Information:

Catalog Number	Description
NMX004-501	NextMove BX^{II} 2 axis controller
NMX004-502	NextMove BX^{II} 3 axis controller
NMX004-503	NextMove BX^{II} 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)

World Headquarters (U.S.A.):
Baldor Electric Company
Tel: +1 479 646-4711
Fax: +1 479 648-5792
E-mail: sales@baldor.com

Australia:
Australian Baldor PTY. Ltd.
Tel: +61 2 9674 5455
Fax: +61 2 9674 2495
E-mail: ray_harding@baldor.com

Europe:
Baldor ASR GmbH, Germany
Tel: +49 (0) 89 905 08-0
Fax: +49 (0) 89 905 08-491
E-mail: sales@baldor.de

Europe (Southern):
Baldor ASR AG, Switzerland
Tel: +41 52 647 4700
Fax: +41 52 659 2394
E-mail: sales@baldor.ch

Japan:
Baldor Japan Corporation
Tel: +81 45-412-4506
Fax: +81 45-412-4507

Mexico:
Baldor de Mexico
Tel: +52 477 761 2030
Fax: +52-477 761 2010

Singapore:
Baldor Electric PTE. Ltd.
Tel: +65 744 2572
Fax: +65 747 1708
E-mail: baldorsg@singnet.com.sg

United Kingdom:
Baldor UK Ltd
Tel: +44 (0) 1454 850000
Fax: +44 (0) 1454 859001
E-mail: sales@baldor.co.uk

For additional office locations visit www.baldor.com

Local Distributor:

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