

Mint^{MT} Multi-Tasking Application Note

AN00153-003 – Comparison of NextMove ESB and NextMove ESB-2

Definitions:

MEX – Mint executable

Overview

NextMove ESB-2 is an enhanced version of the NextMove ESB motion controller that adds additional servo axes, encoder channels and is RoHS compliant.

What is RoHS?

The RoHS Directive stands for "the restriction of the use of certain hazardous substances in electrical and electronic equipment". This Directive bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants.

The RoHS Directive does not currently apply to medical devices, monitoring and control instruments, large-scale stationary industrial tools, spare parts for the repair or reuse of electrical and electronic equipment placed on the market before July 1, 2006, equipment relating to protection of essential interests of state security, weapons, ammunition and military equipment designed for specifically military purposes, power generation, or to other exempted applications, generally for technical reliability or safety reasons.

For this reason Baldor Products are exempt from European Legislation as the majority of applications are covered under the exemptions. However, it is our policy, where possible and following rigorous testing and strict process controls, to produce RoHS compliant products.

Hardware Changes on the New NextMove ESB-2



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Two additional encoder inputs have been added, giving 4 axes of servo control plus master encoder. The product will have two axis variants:

1. 3 controlled servo axes plus two auxiliary axes that can be used as a reference for following applications or dual encoder feedback.
2. 4 controlled servo axes plus one auxiliary axis that can be used as a reference for following applications or dual encoder feedback.

NextMove ESB-2 supports 12 digital output channels compared with 11 on NextMove ESB. The additional output can be found on connector X4 pin 7 (where previously it was a no-connect).

The new NextMove ESB-2 controllers have an orange seven segment display. NextMove ESB has a green display.

NextMove ESB-2 has the same dimensions and mounting points as NextMove ESB.

Encoders

The encoder channels on NextMove ESB are able to supply up to 250 mA per channel for powering external encoders. A total of 750 mA is available for all encoders.

The total power available on NextMove ESB-2 for powering external encoders is 1250 mA.

The five encoder inputs on NextMove ESB-2 are referenced as follows:

Hardware Input	Mint Keyword & Channel
Encoder 0	ENCODER(0)
Encoder 1	ENCODER(1)
Encoder 2	ENCODER(2)
Encoder 3	ENCODER(3)
Encoder 4	AUXENCODER(1)

On NextMove ESB, encoder channel 2 had a different specification from the first two encoder channels, allowing for single ended encoders and the ability to decode step/direction rather than A/B/Z.

All encoder channels on NextMove ESB-2 are now the same specification which does not allow for single ended or step/direction decode.

Auxiliary encoder channel 0 (AUXENCODER(0)) is a pseudo encoder input that multiplexes with digital input channels 17, 18 & 19. See the installation manual for more details.

Firmware Compatibility

NextMove ESB-2 firmware is not compatible with NextMove ESB firmware. In order to download firmware it will be necessary to use Mint WorkBench v5.5 Build 5560 or later. Using an older Mint WorkBench or using older firmware will result in the error message 'Incompatible firmware for controller'.

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Mint Compatibility

Mint source code is backward compatible, but you will need to recompile the Mint program for your application.

If you have used the controller cloning facility within Mint WorkBench, these cloned files will need to be re-created to use new firmware and compiled Mint code.

Mint WorkBench and ActiveX

Mint WorkBench v5.5 Build 5560 (or later) should be used with NextMove ESB-2. Previous versions of Mint WorkBench will display 'Unknown Controller' when the USB bus is scanned. Mint WorkBench will still communicate correctly with the controller.

'Mint WorkBench v5.5 & Mint Motion Center' can be downloaded from www.baldormotion.com.

To connect to NextMove ESB-2 from a host application, use the 'SetUSBControllerLink' ActiveX method.

Each controller has a number of enumerations as follows:

	NextMove ESB	NextMove ESB-2
ControllerType	23	36
Platform	23	36
NodeType	29	29

Compatibility with Existing Applications

If the application does not use a Mint program, or the Mint program is compiled and downloaded by the application or Mint WorkBench, then an existing NextMove ESB can be replaced with NextMove ESB-2 without any changes.

If the application uses a compiled Mint program (.MEX file) then the Mint program must be re-compiled before it will work with NextMove ESB-2.

An embedded application will need to be recompiled using new libraries.

The following table summarises these scenarios

Scenario	Changes Required for NextMove ESB-2
No Mint program	None
Mint program compiled and downloaded from Mint Workbench	None
Mint program compiled and downloaded from host application	None
Compiled program (.MEX) downloaded from Mint Workbench or host application	Program must be recompiled
Embedded application	Recompile needed with new libraries

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Scenario	Changes Required for NextMove ESB-2
Use with older versions of Mint WorkBench (prior to Build 5560)	Fully functional apart from the description of 'Unknown Controller'
Use with existing host applications using ActiveX control prior to Build 5560.	Fully functional apart from consideration of Mint program download as mentioned above
Cloned controller	Cloned file must be recreated to include the new firmware and compiled Mint code (.MEX)

See application note AN00155 for details on moving from NextMove BX^{II} to NextMove ESB-2.

Variants

There are 3 options on NextMove ESB-2 giving 8 variants in total:

- RS232 or RS485 communication on the serial port.
- Differential or single ended stepper drivers.
- 3 servo channels or 4 servo channels.

Any encoder channels not used for servo control may be used as master encoder inputs for master/slave motion or for dual encoder feedback.

Order codes

The following table shows the order codes for NextMove ESB-2 compared with NextMove ESB.

Description	NextMove ESB	NextMove ESB-2
USB and RS232, 3 servo, 4 stepper (differential)	NSB002-501	NSB202-501
USB and RS485, 3 servo, 4 stepper (differential)	NSB002-502	NSB202-502
USB and RS232, 3 servo, 4 stepper (single ended)	NSB003-501	NSB203-501
USB and RS485, 3 servo, 4 stepper (single ended)	NSB003-502	NSB203-502
USB and RS232, 4 servo, 4 stepper (differential)	NA	NSB204-501
USB and RS485, 4 servo, 4 stepper (differential)	NA	NSB204-502
USB and RS232, 4 servo, 4 stepper (single ended)	NA	NSB205-501
USB and RS485, 4 servo, 4 stepper (single ended)	NA	NSB205-502