FAQ

LEGOeducation.com

LEGO System A/S | LEGO Education | 7190 Billund | Denmark
Tel.: +45 7950 6070 | Fax: +45 7533 8335

Software Questions

1. Terminology

1.1 Q:What does EV3 stand for?
This is the third generation of the LEGO Education MINDSTORMS platform and the "EV" stands for evolution.

1.2 What is a P-brick?
The P-brick is a programmable intelligent brick that controls motors and sensors, as well as providing wireless communication (Wi-Fi and Bluetooth®).

2. Programming

2.1 Can you use EV3 Software on both Mac and PC?
The EV3 software can be used on both Mac and PC platforms to program LEGO® MINDSTORMS® Education EV3 P-bricks.

2.2 What programming platforms can you use with LEGO MINDSTORMS Education EV3?
Besides the EV3 software, you can use also LabVIEW and RobotC. EV3 is an open-source platform and, therefore, we anticipate the MINDSTORMS community to develeop additional languages such as JAVA.

2.3 Is there on-brick programming?
Yes. We have continued and improved the on-brick programming with the LEGO MINDSTORMS Education EV3 *brick. Students can easily program basic tasks on the brick and also conduct basic data logging. All of the on-brick programs can be uploaded into the* LEGO MINDSTORMS Education EV3 *software for continued and advanced work.*

2.4 Can I program retail MINDSTORMS hardware with my LEGO MINDSTORMS Education EV3 Software and vice versa?
Yes., In theory it is possible. However, in reality it will difficult since the two products differ significantly. The retail software version does not include all of the programming blocks needed for the education hardware, and it does not included data logging or the teacher version of the Content Editor. Also, it is not possible to utilize the Robot Educator Learning Tool together with the retail set as it is not possible to build the Robot Educator model.

2.5 Will there be tools to create my own software programming blocks for LEGO MINDSTORMS Education EV3 Software?
Yes. For most users the tool is called MyBlocks and is already available inside the standard EV3 software. For people creating their own hardware, a software developer kit will be made available.

2.6 Can I program the LEGO MINDSTORMS Education EV3 P-brick using NXT Software?
No. It is not possible to program your EV3 P-brick with the NXT Software.

***2.7* What is the longest length of the program for onboard programming**
16 blocks (excl. the Start and Loop block)

2.8 Will there be a PDF which shows how to program both for onboard and computer?

There will be a PDF User Guide which will give a short introduction to the Brick Programming App on the EV3 Brick and how to make a program there. For EV3 Software programming, there will be 2 Quick Start videos in the Lobby which will introduce the user to programming. In addition, there will be a large number of Robot Educator Tutorials teaching how to program in the Software

2.9 Is there a print function for the programming?

Yes

2.9.1 Can one take a screen shot of the whole program?

Yes, in the Print settings, you can choose to print the entire view (all of the program(s)) or just the part of the program visible on the screen. Also, you can zoom out so that the entire program will fit within the screen

3.What is new about Data Logging?

Based on educator feedback, LEGO Education knew how important it was for the data logging functionality to be robust for technology and science classes moving forward. Therefore, we have created a whole new data logging environment, which is included in the education version of the LEGO MINDSTORMS Education EV3 *software. The capabilities include:*

Data Logging

- *Live data logging via USB Cable (view Live Graphs)*
- *Remote live data logging via Bluetooth or Wi-Fi (view Live Graphs)*
- *Autonomous data logging – log data on brick and upload to software.*
- *On-brick data logging – set up and execute data logging directly on brick*
- *Oscilloscope mode – view sensor data as soon as connected*

Analysis

- *Prediction tool – draw or make predictions*
  - *Inverse proportionality*
  - *Exponential*
  - *Sine*
  - *Cosine*
- *Basic analysis tools – Point Analysis*
- *Advanced analysis tools - Section Analysis*
  - *Mean*
  - *Median*
  - *Standard deviation*
  - *Curve fit*
- *Easily export data to spreadsheets*

Dataset calculation

- *Unique calculator interface that allows you to make calculations to datasets*
- *Type in formulas*
- *From Rotational counts via Speed to Acceleration*

Graph Programming

- *Unique new LEGO Education feature*
- *Execute actions based on data readings*
- *Set thresholds for experiments to play sound or start motors when threshold is reached*

3.1 The onboard Data Logging program – can this be autoscaled?

The graph area in the Brick Datalog App will automatically adjust to the (full) scale of the sensor used (e.g. 0-250 for the Ultrasonic Sensor, 0-100 for the Color Sensor). It will not auto scale within this range e.g.in case the sensor readings are only giving low values

4. Robot Educator

4.1 What is Robot Educator?
Robot Educator is the name of both the basic robot and the tutorials found in the software. The Robot Educator is a very simple, quick-to-build robot that students will have in their hands ready to learn the basics of robotics. It is the robot that introduces the student to the world of robotics. The Robot Educator learning tool is designed to take you and your student's through the essentials of programming, data logging, and hardware. It does so in a structured and engaging way, ensuring that everyone is constructing, programming, and experimenting within a minimum of time.

4.2 Are the Robot Educator activities EV3 specific?
Yes.

4.3 Is there any added audio/text support with Robot Educator?
Robot Educator has text, animations, interactive animations that help explain programming, teacher notes, and sample programs/experiments.

4.4 Can I use the new Robot Educator learning tool for NXT?
No. The Robot Educator is optimized for LEGO MINDSTORMS Education EV3 hardware and software.

4.5 Is LEGO MINDSTORMS Education EV3 backwards compatible to NXT hardware?
Yes. You can program your NXT brick using the new LEGO MINDSTORMS Education EV3 software. However, not all software features are supported by the NXT P-brick

5. What is the Content Editor in the software? How does it help educators?

The Content Editor enables educators to edit, adapt, and customize activities - or create their own from scratch. Teachers can use the Content Editor to customize lessons directly for their student's needs or customize to the different grade levels.

The Content Editor provides a digital workbook for students where they can capture their work by inserting text, images, videos and sound creating their own digital workbook.

The workbook can easily be used for sharing and communication of end-results, among other things making assesment easier.

5.1 Will content editor support .mov and .avi files?

The Content Editor will support the following file formats, which does not include .avi:

Picture
".jpg", ".jpeg", ".png"

Video
".mp4", ".asf", ".wmv", .mov"

Sound
".mp3", ".wma"

5.2 Can the content in the Content Editor be printed?

Yes. This is a planned functionality in the first upgrade patch 1.1, which will be available early 2014

5.3 Can you type in Chinese in the Content Editor?

Yes

5.4 In the content editor can you include movies? And also share files?

Video files can be integrated in the Content Editor. There is no direct sharing functionality other than sharing the Project file via email etc.

5.5 Is there a mechanism for resizing pictures?

No

6. In what languages is the LEGO MINDSTORMS Education EV3 software available?

US English
British English
Danish
Norwegian
Swedish
German
French
Spanish
Italian
Portuguese
Dutch
Korean
Japanese
Chinese
Russian
Arabic

7. What new software updates have been made?

7.1 What are the new features in the LEGO MINDSTORMS Education EV3 software versus NXT?
There are many new features and improvements from NXT to EV3. Some of the more noticable are:

Lobby:

- *New full screen lobby to navigate through the content provided by LEGO Education, third parties and user generated; making sure the teaching objective is in focus.*

Content Editor :

- *Content is editable directly inside the environment, enabling customization of existing projects or creation of new ones from scratch.*
- *The Content Editor provides a digital workbook for students where they can capture their work by inserting text, images, videos and sound creating their own digital workbook.*

Tighter integration between the P-brick and the programming environment:

- *The hardware page enables monitoring the status and values measured by all the hardware elements.*
- *Hardware elements are automatically recognized thanks to auto-id.*
- *Bluetooth configuration is facilitated by the USB to Bluetooth features.*

Debugging features now part of the programming environment:

- *Execution highlight.*
- *Programming blocks will display a warning symbol if expected hardware by the programming block is different from the detected hardware by auto-id.*
- *Probes enable seeing the values going through the data wires.*

New programming blocks possibilities:

- *Simple strip programming by snapping blocks together (no need to use the beam anymore).*
- *Block parameters configured directly on block.*
- *Read program sequence directly on blocks.*
- *Improved sequence wires that facilitate showing the structure of the program and creating parallel execution.*
- *Wait for change added to easily create robots that behave according to change in the environment, as opposed to wait for threshold that only works by comparing measured values.*
- *Data wires improved and data casting added to simplify data type conversion.*
- *Arrays integrated in the standard blocks.*
- *Loop interruption now possible, enabling creating advance state control mechanisms.*

Datalogging:

- *Oscilloscope mode enables live monitoring of the sensors to prepare experiments and validate setup.*
- *Dataset calculation integrated, enabling analysis of the data coming from the sensors.*
- *Graph programming added; this feature enables users to create zones on the graph that will make the robot react in the physical world based on the data on the graph.*

8. Will the LEGO MINDSTORMS Education EV3 software work on my tablet/phone?
No. At release time, the software works on PC and Mac laptop and desktop systems. Simple control apps are under development and are expected Q3 2013.

9. How do I update the Software?
Under Help at the top menu bar of the EV3 Software, you can enable the EV3 Software to automatically check for software updates. By clicking Check for Software Updates, a check mark will appear and the software will regularly check for software updates (this requires an Internet connection). If a relevant update is available, you will be notified by the software. If you wish to install this software update, you will be taken to a website where you can download the update file. Once downloaded, you can install the update

Bluetooth

1. What can Bluetooth in the LEGO MINDSTORMS Education EV3 P-brick be used for?
The Bluetooth allows for communication to the programming environment or for brick-to-brick communication.

2.Why use a USB cable to connect the LEGO MINDSTORMS Education EV3 P-brick to the computer when there is Bluetooth communication?
USB connection is faster and some PCs do not have Bluetooth.

3. Can LEGO MINDSTORMS Education EV3 P-bricks be daisy-chained through Bluetooth?
No. Daisy chain is using the USB host to USB connections between bricks.

4. What is the difference between Wi-Fi and Bluetooth?
Wi-Fi and Bluetooth serve different purposes. Bluetooth is for close-range communication between two devices. Wi-Fi is for network communication on a wider range, requires a Wi-Fi access point –router; and will consume more battery than Bluetooth.

5. What does the 'Made for ipod, iphone and ipad" mean?
The Bluetooth communication on the EV3 will support same protocol that iOS devices use, e.g. you can communicate with ipod, iphone and ipad (that is not possible today in the NXT).

Wi-Fi

1. What can Wi-Fi with the LEGO MINDSTORMS Education EV3 P-brick be used for?
The Wi-Fi feature can be used for communication from brick to programming environment. It requires that a Wi-Fi dongle is connected to the USB host of the P-brick. We recommend the LEGO MINDSTORMS Education EV3 Wi-Fi dongle.

2.Why use a USB cable to connect the LEGO MINDSTORMS Education EV3 P-brick to the computer when there is Wi-Fi communication?
The USB connection is faster, and some classrooms are not equiped with Wi-Fi. The battery will last longer if the Wi-Fi is turned off.

3. Can LEGO MINDSTORMS Education EV3 P-bricks be daisy-chained through Wi-Fi?
No. Daisy chain is using the USB host to USB connections between bricks.

4. Is a router needed?
Yes. If you want to use Wi-Fi, a router is needed.

5. Is Wi-Fi better than Bluetooth?
Wi-Fi and Bluetooth serve different purposes. Bluetooth is for close-range communication between two devices. Wi-Fi is for network communication on a wider range and will consume more battery than Bluetooth.

Hardware Questions

1. Sensors

1.1 What LEGO sensors are available for LEGO MINDSTORMS Education EV3?
The following sensors are indcluded in the Core Set:
2 touch sensors, 1 color sensor, 1 ultrasonic sensor, 1 gyro sensor
Besides these there are the following sensors available:
IR Seeker, IR Beacon, temperature sensor, Renewable Energy Set as well as third-party sensors like HiTechnic, Vernier and DCP.

1.2 Will LEGO MINDSTORMS Education EV3 sensors work with the NXT P-brick?
No. The LEGO MINDSTORMS Education EV3 sensors will not work with the NXT P-Brick.

1.2.1 Will a new cable connection be required?
No. LEGO MINDSTORMS Education EV3 uses the same RJ12 connector cables as the LEGO MINDSTORMS Education NXT.

1.3 How do the LEGO MINDSTORMS Education EV3 sensors compare with the NXT sensors?

The LEGO MINDSTORMS Education EV3 Sensors are completely new sensors optimized for education use, providing a better build interface, higher performance and more accuracy than NXT Sensors.

For detailed information on the LEGO MINDSTORMS Education EV3 Sensors see Product Sheets.

1.4 Can LEGO MINDSTORMS Education EV3 sensors be used together with NXT sensors?
Yes. LEGO MINDSTORMS Education EV3 uses the same RJ12 connector cables as the LEGO MINDSTORMS Education NXT.

1.5 Can NXT sensors be used with the LEGO MINDSTORMS Education EV3 P-brick?
Yes. LEGO MINDSTORMS Education EV3 uses the same LEGO Technic elements and RJ12 connector cables.

1.6 Can you use **We**Do sensors with the LEGO MINDSTORMS Education EV3 P-brick?
No. The connectors do not match.

2. Motors

2.1 Which motors are included in the Core Set?

2 large motors
1 medium motor

2.2 How do the LEGO MINDSTORMS Education EV3 motors compare with the NXT motors?
Large motor specifications are the same as on NXT; however the build interface is optimized for faster and more complex building possibilities.

The medium motor is a completely new motor, providing new possibilities.

For detailed information on the LEGO MINDSTORMS Education EV3 motors see Product Sheets.

2.3 Are the LEGO MINDSTORMS Education EV3 motors interchangeable with the NXT motors?
Technically yes, but the designs are different between the LEGO MINDSTORMS Education EV3 large motor and the NXT motor. The LEGO MINDSTORMS Education EV3 large motor allows for a better building experience.

2.3.1 Can LEGO MINDSTORMS Education EV3 and NXT motors be used together?
Yes.

2.4 Can you use the LEGO MINDSTORMS Education EV3 motors with the NXT P-brick?
Yes. You can use both the large and the medium motor with NXT.

2.5 Can you use power-function motors with LEGO MINDSTORMS Education EV3 P-brick?
No. The connectors do not match.

2.6 What does "daisy chain" mean?
Daisy chain is the ability to link up to four LEGO MINDSTORMS Education EV3 P-bricks together using a USB wire and thereby enabling your robot to have 16 output ports and 16 input ports, all controlled from the main LEGO MINDSTORMS Education EV3 P-brick.

2.6.1 What does daisy chain require?
Multiple LEGO MINDSTORMS Education EV3 P-bricks, sensors and motors, plus additional standard USB wires for LEGO MINDSTORMS Education EV3.

2.7 How many LEGO MINDSTORMS Education EV3 P-bricks can I daisy chain?
You can daisy chain up to four LEGO MINDSTORMS Education EV3 P-bricks.

2.8 Is daisy chaining supported between Wi-Fi and Bluetooth?
No. Daisy chains require a USB wire connection between the LEGO MINDSTORMS Education EV3 P-bricks.

3. Intelligent Brick

3.1 How is the LEGO MINDSTORMS Education EV3 P-brick different from the NXT?

The LEGO MINDSTORMS Education EV3 P-brick is a completely new P-brick and the most powerful P-brick ever created by LEGO Education. The LEGO MINDSTORMS Education EV3 P-brick is built up around a faster and stronger processor, which not only increases performace on all parameters compared to the NXT but also introduces new possibillities not available with NXT.

For detailed information on the LEGO MINDSTORMS Education EV3 P-brick see Product Sheet.

3.2 Will the LEGO MINDSTORMS Education EV3 P-brick and NXT P-brick use the same firmware?
No.

4. Battery

4.1 What is the charge time and conditions for the rechargeable battery?
The same as MINDSTORMS NXT. Full charge time is four hours and requires a LEGO DC Charger (product 8887).

4.2 Will the batteries interchange between the LEGO MINDSTORMS Education EV3 and the NXT?
No. , The charger is the same between the two platforms and you can therefore reuse your current charger.

4.3 Will the chargers interchange?
Yes.

4.4 What are my battery options? (AA vs. lithium vs rechargeables…)?
Recommended use is either AA alkaline batteries or LEGO MINDSTORMS Education EV3 rechargeable battery.

4.5 Will there be an upgrade/conversion kit from NXT to LEGO MINDSTORMS Education EV3?
No., But the LEGO MINDSTORMS Education EV3 *solution offers backwards compatibility to NXT. You can therefore use your NXT solution together with EV3 in many situations.*

However, *if you want the full benefit of the LEGO MINDSTORMS Education EV3 solution you will need to transition to EV3.*

5. LEGO MINDSTORMS Education Core Set (45544)

5.1 What comes in the core set?

Sturdy storage box and sorting tray for easy classroom management
Building instructions
Rechargeable battery
Ball Wheel
Connecter Cables
USB Cable
LEGO Technic Elements – piece count 541 pcs.
Three motors and five sensors
1 P-brick
2 large motors
1 Medium Motor
2 touch sensor
1 Color Sensor
1 Ultrasonic Sensor
1 Gyro Sensor

5.3 Why is there no longer a sound sensor?
Input from teachers using the NXT platform indicated that the sound sensor was problematic in noisy classrooms and not as relevant for STEM teaching as other sensors. Instead, we have included the new gyro sensor which was developed classroom use and competition.

6 Will all the model builds be available as PDFs?
Yes

6.1 Where will teachers find the BI for Expansion Set models?
Inside the Software – in the Lobby area

LEGO MINDSTORMS Education NXT and LEGO MINDSTORMS Education EV3 Compatibility

1. Can you use NXT parts with the LEGO MINDSTORMS Education EV3?
LEGO MINDSTORMS®Education EV3 uses the same LEGO®Technic elements and RJ12 connector cables as the LEGO MINDSTORMS®Education NXT, so all your existing sensors, motors and building elements will work with the new platform. Please notice that the NXT rechargeable battery cannot be used together with LEGO MINDSTORMS Education EV3 P-brick.

2. Can I connect my NXT P-brick to the LEGO MINDSTORMS Education EV3 P-brick?
No. It is not possible to daisy chain with the NXT brick.

3. Can I reuse the rechargeable battery and charger?
No. You cannot reuse your battery, as the build interface has changed, but you can reuse your DC Charger (8887).

4. Can I program the NXT P-brick using LEGO MINDSTORMS Education EV3 software?
You can program your NXT P-brick using the new LEGO MINDSTORMS Education EV3 software. However, not all of the software features are supported by the NXT P-brick.

5. Can I program the LEGO MINDSTORMS Education EV3 P-brick using NXT software?
No. It is not possible to program your LEGO MINDSTORMS Education EV3 P-brick with the NXT software.

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