

CHAPTER 2



Programming with the EV3 Language

Now that you have been introduced to the pieces that you will need for building excellent LEGO MINDSTORMS EV3 models, let's talk about how to do one of the most important things: programming the EV3 Brick. One of the challenges in building with LEGO MINDSTORMS is that "building is only half the battle." Once you get your motors and sensors properly constructed on your MINDSTORMS machine, you are going to have to tell it what to do. This will require programming skills, and the EV3 Brick is your microcomputer of choice.

Just to let you know, it is entirely possible to program your EV3 Brick using the six buttons on the EV3 Brick, which I only briefly introduced you to in Chapter 1. I'm not going to show you how to specifically program the EV3 Brick for every program that you will see in this book. For me, I found it was easier for me to create EV3 programs with the use of my computer. I did this for three reasons: 1) It is a lot easier for me to get a screenshot from my computer than the EV3 Brick, 2) it is easier for me to upload the code that you can download off the Apress website, and 3) you will probably be programming from your computer rather than directly on the EV3 Brick anyway.

The Four Basic Screens of the EV3 Brick

If you hold down the center key, the EV3 Brick will come on. You will then see a screen with four tabs, and the following explains what each tag signifies after Figure 2-1.

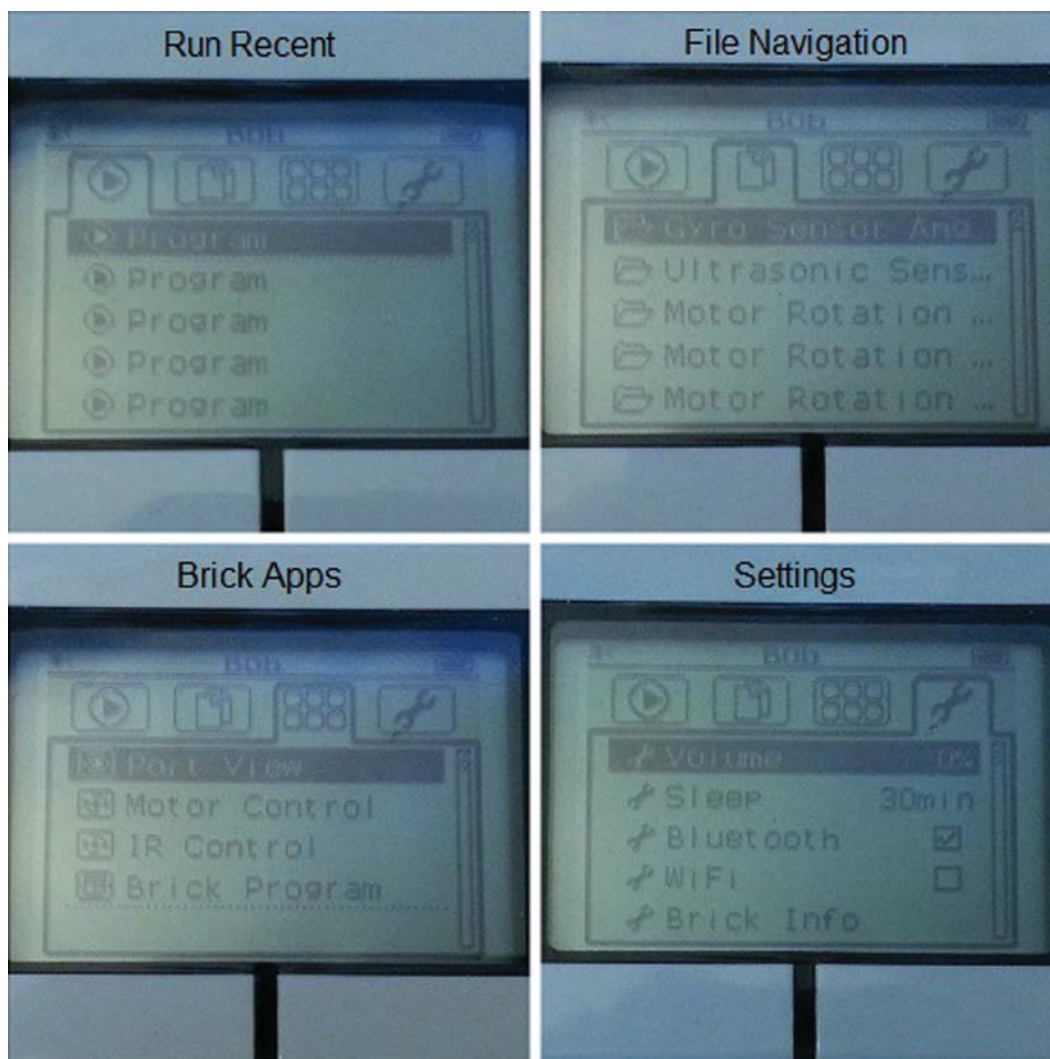


Figure 2-1. The four basic tabs on the EV3 Brick display

Run Recent

You will find that this screen is blank unless you downloaded and ran specific programs. Those programs that you have most recently ran will be on this screen, the one at the top being the most recently run program. I'll discuss how to download programs at a later time, but when the programs are visible, you can select one with the buttons and press center to execute.

File Navigation

Here is where you can access and manage all files on the EV3 Brick. This includes any files stored on an SD card. You will note that all these files are located in project folders and they include the sounds and/or images used in each project. You can use sounds and/or images on the EV3 Brick display for your LEGO MINDSTORMS project, and I will detail how to do that in the chapter on Sight and Sound in Chapter 4.

Brick Apps

If I may steal a phrase from Apple, “there’s an app for that.” In working with EV3, you will find many apps which will be helpful when working with EV3 programs. The EV3 Brick comes with four apps pre-installed (three of which are shown in Figure 2-2).

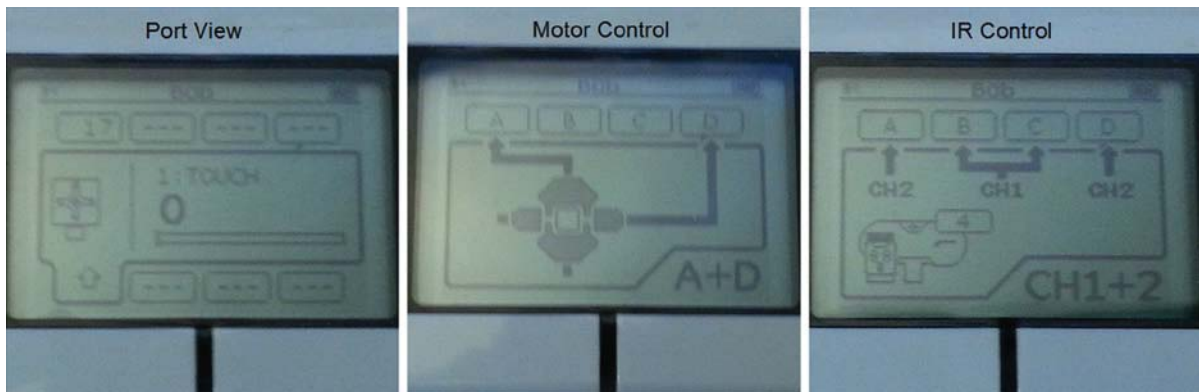


Figure 2-2. Three of the four pre-installed programs for the Brick apps

It is possible to make apps of your own. For now, I will discuss each app from left to right.

Port View

As I stated in Chapter 1, the sensors and/or motors must be attached to the EV3 Brick via connector cables in order to function. You will discover that certain projects occupy many ports, and it is often difficult to keep track of what sensors and motors go with what ports. Port View will give you a quick view about what is attached, as well as their specific ports.

Motor Control

In this app, you can control the movement of the motors at a touch of an EV3 Brick button. You can control motors connected to Port A using the up and down buttons and to Port D using the Left and Right buttons. You can also toggle into a different mode by hitting the center key, which will allow you to control a motor at Port B with the Up and Down keys and a motor at Port C using the left and right buttons.

IR Control

This particular app requires that the Remote Infrared Beacon acts as the remote control and the Infrared Sensor is the receiver. This allows for all types of wireless motor controls, and you should consult the User Guide for more information.

Brick Program

This is the place where you can create programs on the EV3 Brick (no computer required). I’m not going to spend a lot of time talking about this section, but I wanted to let all those new to LEGO MINDSTORMS EV3 know that it exists.

You can see in Figure 2-3 that you can set up a program. All that is required is to click the middle button in the middle of the two posts that you can see in the Brick Button main screen.

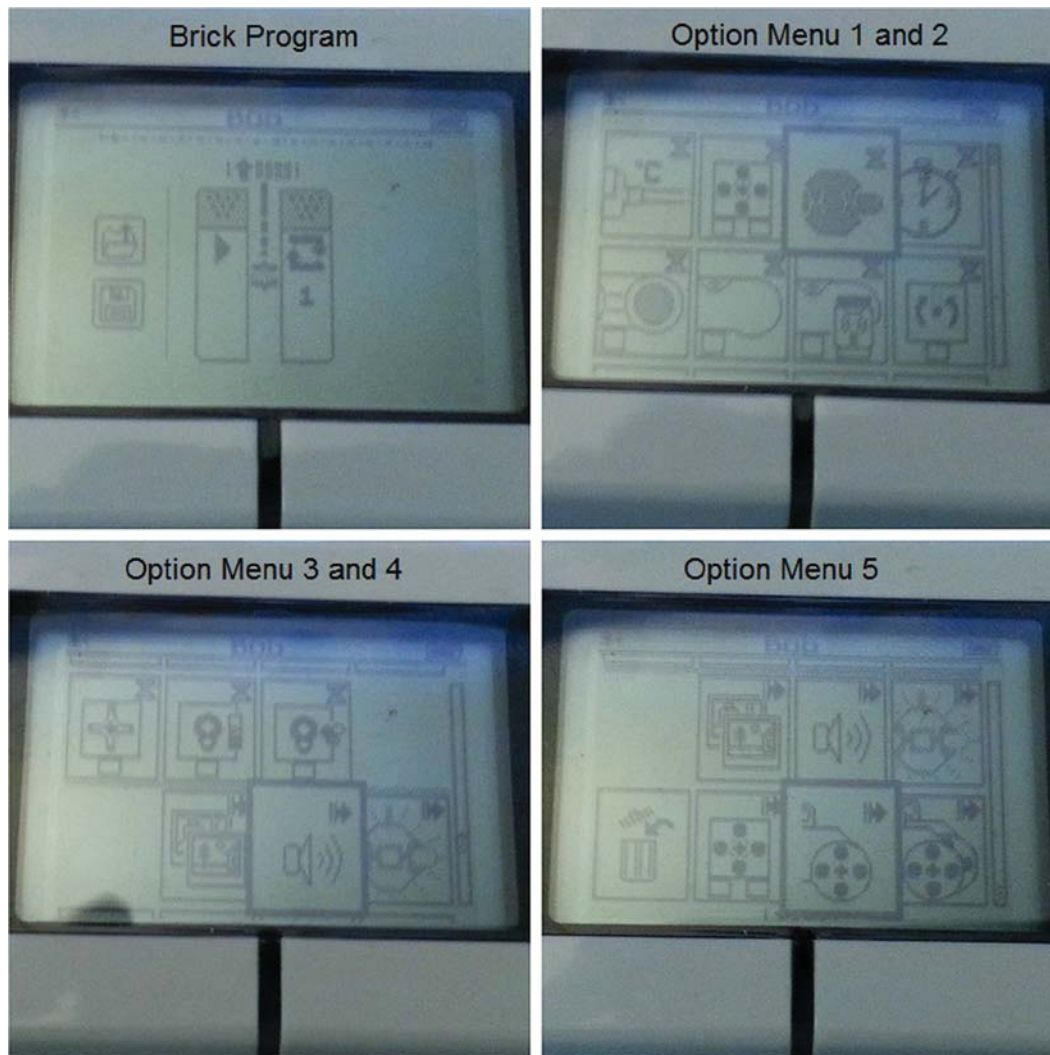


Figure 2-3. Various screens on the Brick Program app on the EV3 Brick

From there, you can take command of the motors, sensors, displays, and sounds. You can open an individual program and adjust the speed of a motor and other such parameters that I will explain later.

The Brick Program app is where you can look at programming blocks, and the Instruction Manual for the basic set has a few activities that you can try out to show how they work. I recommend spending some time playing around here just to get used to how these work, but I will go more into detail about the programming blocks when I discuss the software later in this chapter. In fact, you might find it easier to program from your computer and then just download it straight to the EV3 Brick itself.