Programming LEGO NXT Robots using NXC

(beta 30 or higher)

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with revisions by John Hansen

Preface

As happened for good old Mindstorms RIS, CyberMaster, and Spybotics, to unleash the full power of Mindstorms NXT brick, you need a programming environment that is more handy than NXT-G, the National Instruments Labview-like graphical language that comes with NXT retail set.

NXC is a programming language, invented by John Hansen, which was especially designed for the Lego robots. If you have never written a program before, don't worry. NXC is really easy to use and this tutorial will lead you on your first steps towards it.

To make writing programs even easier, there is the Bricx Command Center (BricxCC). This utility helps you to write your programs, to download them to the robot, to start and stop them, browse NXT flash memory, convert sound files for use with the brick, and much more. BricxCC works almost like a text processor, but with some extras. This tutorial will use BricxCC (version 3.3.7.16 or higher) as integrated development environment (IDE).

You can download it for free from the web at the address

http://bricxcc.sourceforge.net/

BricxCC runs on Windows PCs (95, 98, ME, NT, 2K, XP, Vista). The NXC language can also be used on other platforms. You can download it from the web page

http://bricxcc.sourceforge.net/nxc/

Most of this tutorial should also apply to other platforms, except that you loose some of the tools included in BricxCC and the color-coding.

The tutorial has been updated to work with beta 30 of NXC and higher versions. Some of the sample programs will not compile with versions older than beta 30.

As side note, my webpage is full of Lego Mindstorms RCX and NXT related content, including a PC tool to communicate with NXT:

http://daniele.benedettelli.com

Acknowledgements

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Contents

I. Writing your first program

In this chapter I will show you how to write an extremely simple program. We are going to program a robot to move forwards for 4 seconds, then backwards for another 4 seconds, and then stop. Not very spectacular but it will introduce you to the basic idea of programming. And it will show you how easy this is. But before we can write a program, we first need a robot.

Building a robot

The robot we will use throughout this tutorial is Tribot, the first rover you have been instructed to build once got NXT set out of the box. The only difference is that you must connect right motor to port A, left motor to port C and the grabber motor to port B.

Make sure to have correctly installed Mindstorms NXT Fantom Drivers that come with your set.

Starting Bricx Command Center

We write our programs using Bricx Command Center. Start it by double clicking on the icon BricxCC. (I assume you already installed BricxCC. If not, download it from the web site (see the preface), and install it in any directory you like. The program will ask you where to locate the robot. Switch the robot on and press **OK**. The program will (most likely) automatically find the robot. Now the user interface appears as shown below (without the text tab).