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1. Introduction

The FireBird 5 research platform is a highly evolved platform for Researchers, educators and students working in the areas of Embedded systems, Robotics, Real Time Operating Systems (RTOS) and Sensor networks. With its support for wide array of sensors and highly configurable layered architecture, The FireBird 5 provides an affordable alternative for end users. Support for Microsoft Robotics Development Studio provides a unified programming interface. Use of Visual Programming Language (VPL) makes it very easy for beginners to write complex programs on FireBird 5 platform. Support for simulated FireBird 5 entity allows users to experiment with a very close to real life simulation environment.

2. Getting started

In order to start using Microsoft Robotics Development Studio (MRDS) with FireBird 5 platform you will need,

- The latest version of robotics studio, which can be downloaded from http://msdn.microsoft.com/en-us/robotics/aa731520.aspx
- Installer for Nex Robotics FireBird 5 platform for MRDS from http://www.nex-robotics.com/MRDS/NexFireBird5MRDS.exe
- Firmware for using FireBird 5 platform with MRDS (http://www.nex-robotics.com/mrds/FireBird5MRDS.hex)

2.1 Installing MRDS

Instructions for downloading and installing MRDS can be found on official MRDS homepage.

2.2 Installing FireBird 5 support for MRDS

- Download the installer from http://www.nex-robotics.com/mrds/NexFireBird5MRDS.exe
- Run the Installer. It will show a welcome screen as follows,

- Click Next
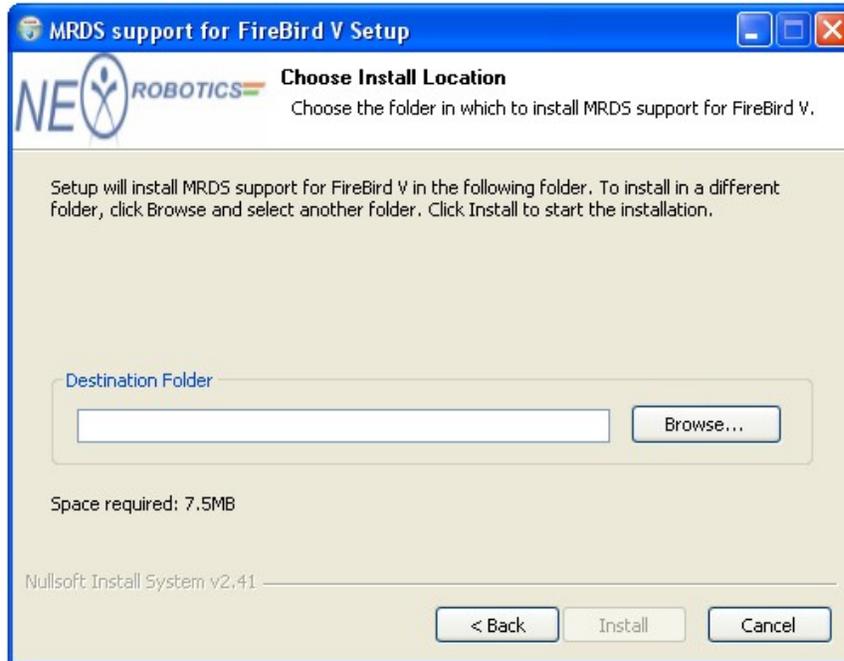
- Choose the directory where Microsoft Robotics Development Studio is installed. Ex. If MRDS is installed in "C:\Documents and Settings\Administrator\Microsoft Robotics Dev Studio 2008 R2 Express", then choose this directory for installation by browsing to this location.
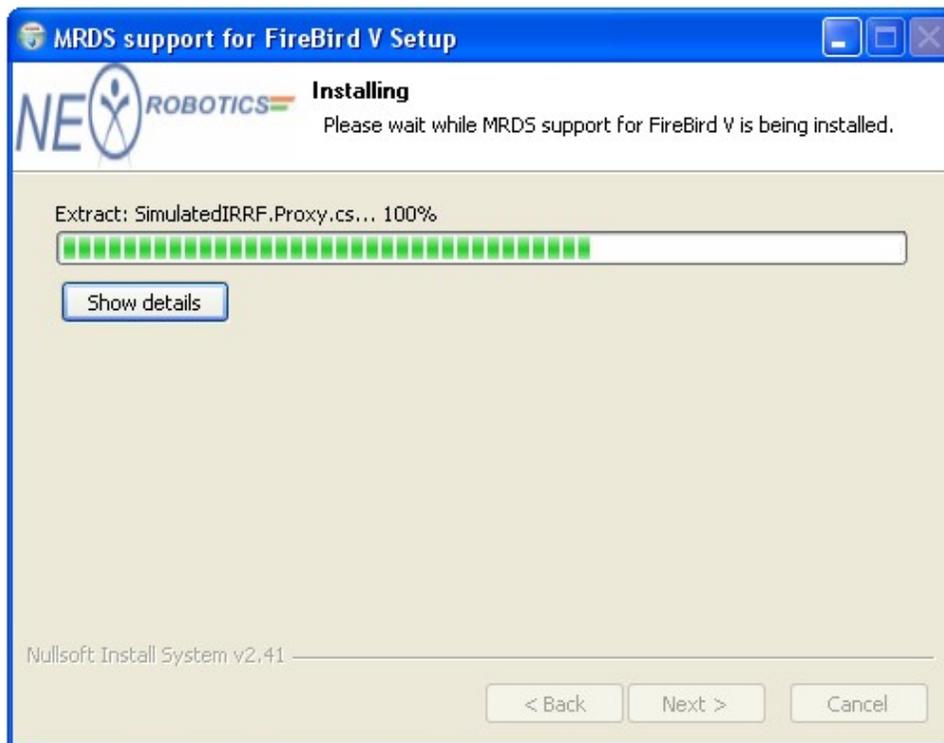
- This will start installing the files required for FireBird 5 platform in MRDS.

- Click Finish to complete the installation.

Navigate to the installation directory by going to Start->Programs->Nex Robotics->FireBird5. The relevant files are located in {MRDSInstallationfolder}\samples\Platforms\NexRobotics\FireBird5.

2.3 Loading firmware on FireBird 5

Download the binary from http://www.nex-robotics.com/mrds/FireBird5MRDS.hex. For loading the hex file on the robot, refer to the chapter 4 of the Fire Bird V robot's hardware manual.

3. Writing Services

You can find the services written for all the sensors on FireBird 5 platform under \samples\Platforms\NexRobotics\FireBird5\Services. This folder contains services such as FireBird5IRRFSensor, FireBird5LightSensorArray, etc. You can partner with these services or subscribe to them for using them in your custom service. For understanding how to write your own service, please refer excellent service tutorial available on MSDN at http://msdn.microsoft.com/library/bb483065.aspx

4. Using Visual Programming language

Services written for FireBird 5 platform are visible in visual Programming Language (VPL) after you install the Nex Robotics software package in your MRDS directory. You will also find the examples for using the FireBird 5 services in VPL in the \samples\Platforms\NexRobotics\FireBird5\VPLTutorials.

Let's take an example of white line follower tutorial to understand how to run these examples.

1. Open the WhitelineFollower.mvpl in VPL.
2. Select the "FireBird5Comm" block and in properties window, under configuration, select "Set Initial Configuration".
3. This will open a "settings" pane. Write the COM port number in the "CommunicationPort" setting. The number must be of the COM port used for communicating with FireBird 5. For example, if you are using COM port 7, then write "7" in "CommunicationPort" setting.
4. Save the project and run the VPL example by pressing "F5" or by choosing "Run->Start".
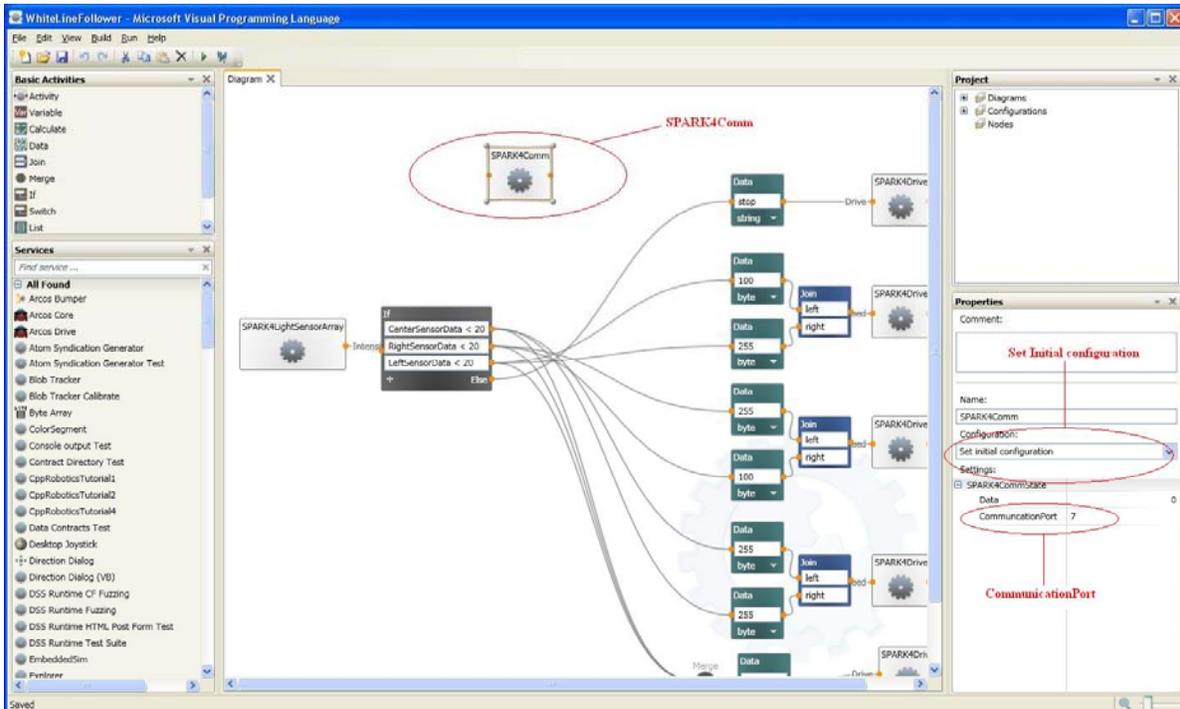
Figure 1: VPL tutorial for white line follower for FireBird 5 platform

5. Using FireBird 5 in visual simulation environment

FireBird 5 platform can be used in Visual simulation environment. You can find the tutorials for the same in \samples\Platforms\NexRobotics\FireBird5\SimulationTutorials. The Infrared Range finder and White Light Sensor services are available for use with the FireBird 5 simulated entity.

The FireBird5SimulationTutorial1 demonstrates how to control the simulated FireBird 5 platform using Simple Dashboard Service.

6. Online Help

Visit Nex Robotics forum for more queries, discussions and updates. (http://www.nex-robotics.com/forum.html)