

Single Board Computer for Mobile Robot Controller

Written by Mada Jimmy

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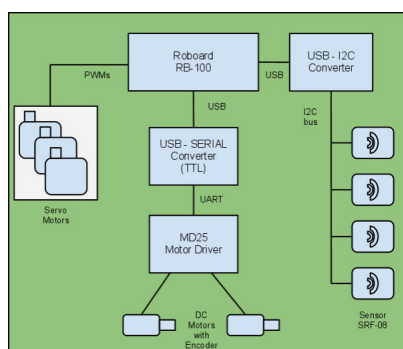
It's good to be considered that SBC may be used for your mobile robot project, instead of medium microcontroller like PIC or Atmega. Microcontrollers are also well and pretty fast in such application, but we are trying to look from another point of view. Single board computer can handle multiple processes at the same time. Of course, it depends on operating system you are using. More over, today's SBC has more powerful processor and more compact design. We will talk about mobile robot application with medium size, about 30cm wide or length.

Roboard RB-100 Single Board Computer.

This computer is quite small for controlling our robot, because it is only 56mm x 96cm. It can be installed with Windows XP operating system and stored to a MicroSD. Like a desktop or laptop computer, this SBC is fully operational on Windows XP. Of course you can also install it with Linux or Windows CE operating system.

Sample interfacing with Roboard.

I will show you sample application for mobile robot that I have done before. We need some basic stuffs in order the robot run normally such as mechanical or platform body, wheel, DC motor with driver, and electronic devices like sensors.



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We have two 12VDC motors to drive the robot using left and right wheel. These motors have encoder so we are able to read position of robot by counting the rotation. MD23 or MD25 motor driver is used for that purpose and for speed control. There are two options to make communication interface between Motor Driver and SBC, that are UART or I2C. For the simplest way, I choose UART interfacing. Then we need USB-Serial converter. Actually we can also use RS232 port of SBC. If we use RS232, then we must convert the voltage to TTL level using MAX 232 or something. It has also TTL serial, but I will use it later for camera.

Roboard has built-in 32 PWM ports that can be used to control servo position. I need only 3 ports for gripper actuator.

Recommended books: