Programing microcontrollers AVR Studio

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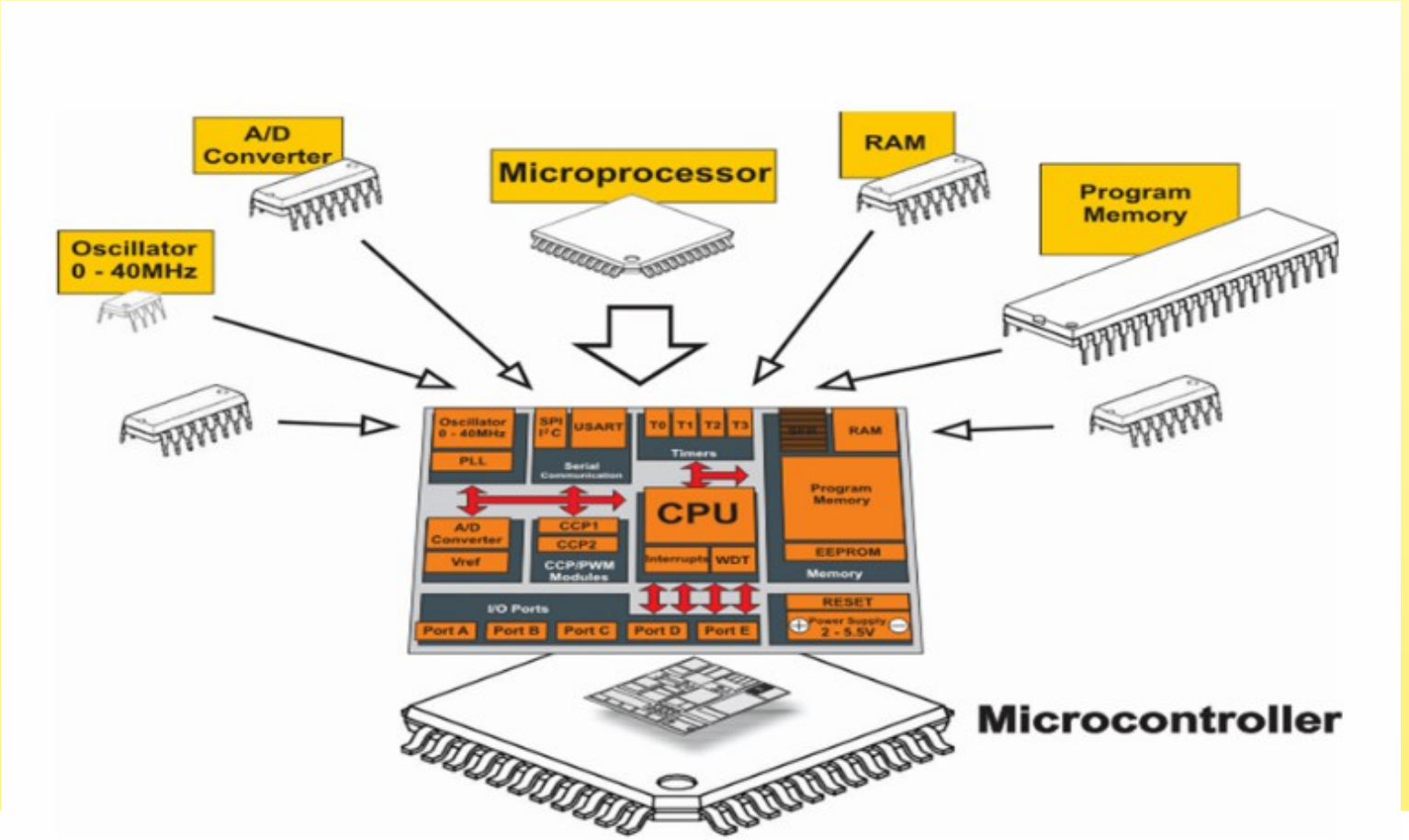
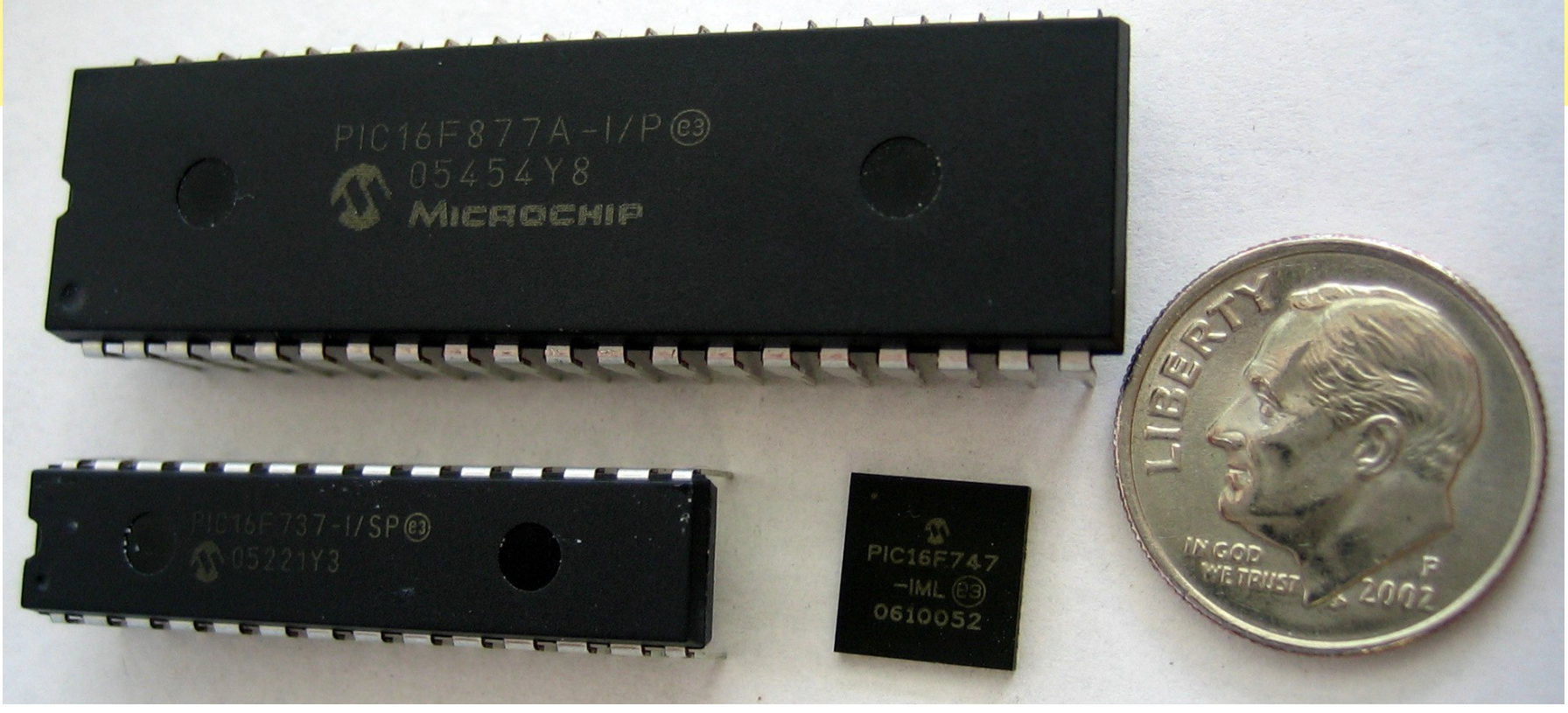
programing microcontrollers using c

A microcontroller is a small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals.



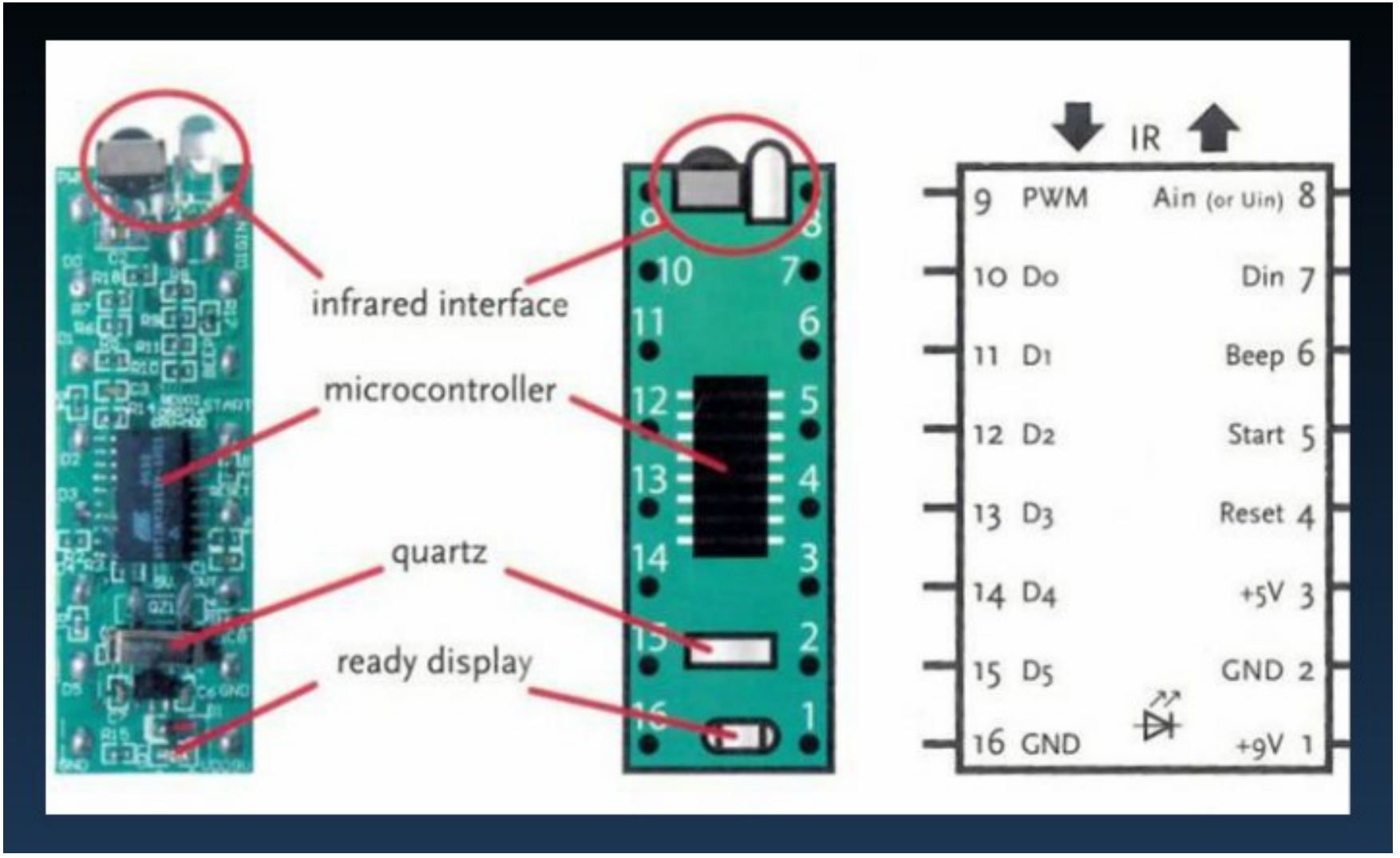
Microcontrollers are used in automatically controlled products and devices, such as automobile engine control systems, implantable medical devices, remote controls, office machines, appliances, power tools, toys and other embedded systems.

By reducing the size and cost compared to a design that uses a separate microprocessor, memory, and input/output devices, microcontrollers make it economical to digitally control even more devices and processes.

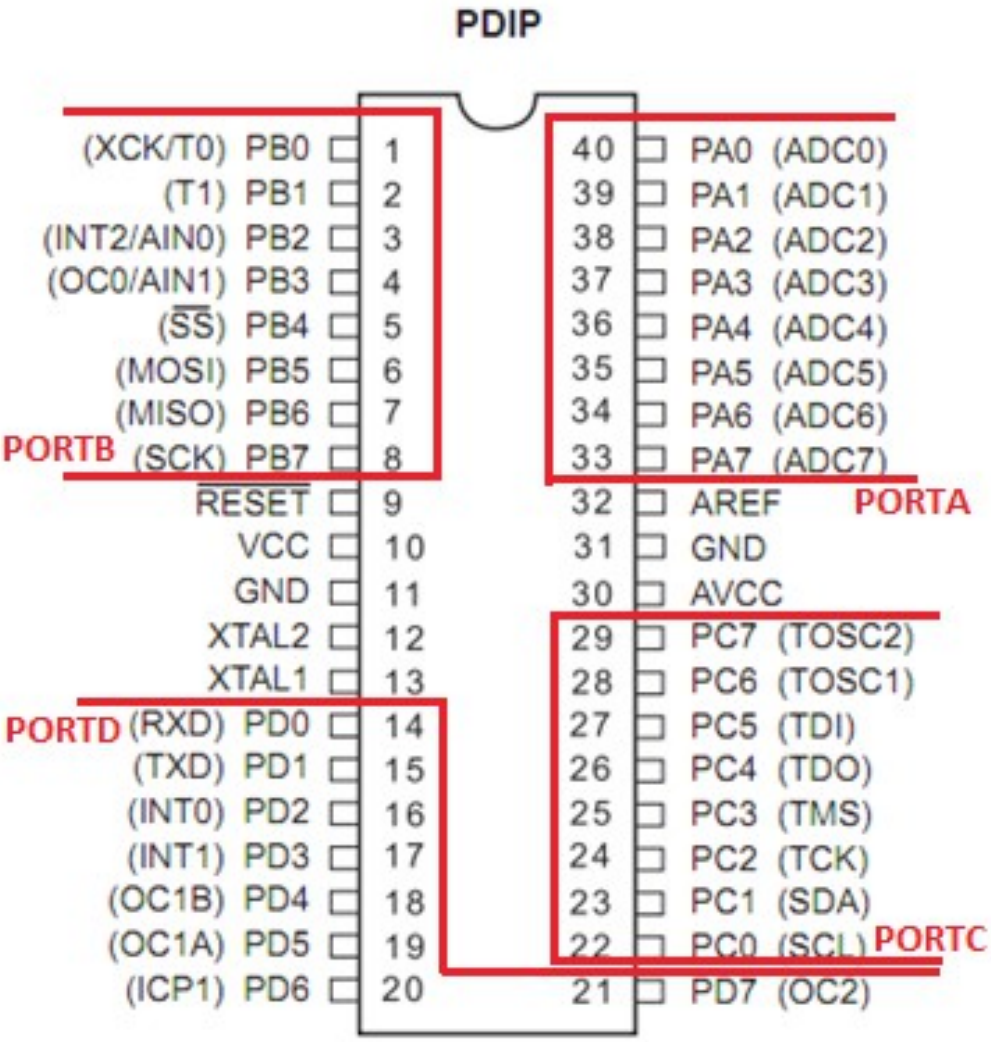


So a microcontroller combines onto the same microchip

- The CPU core
- Memory (both ROM and RAM)
- Some parallel digital I/O



Atmega 32 microcontroller



Programming can be done in several Languages and most used are

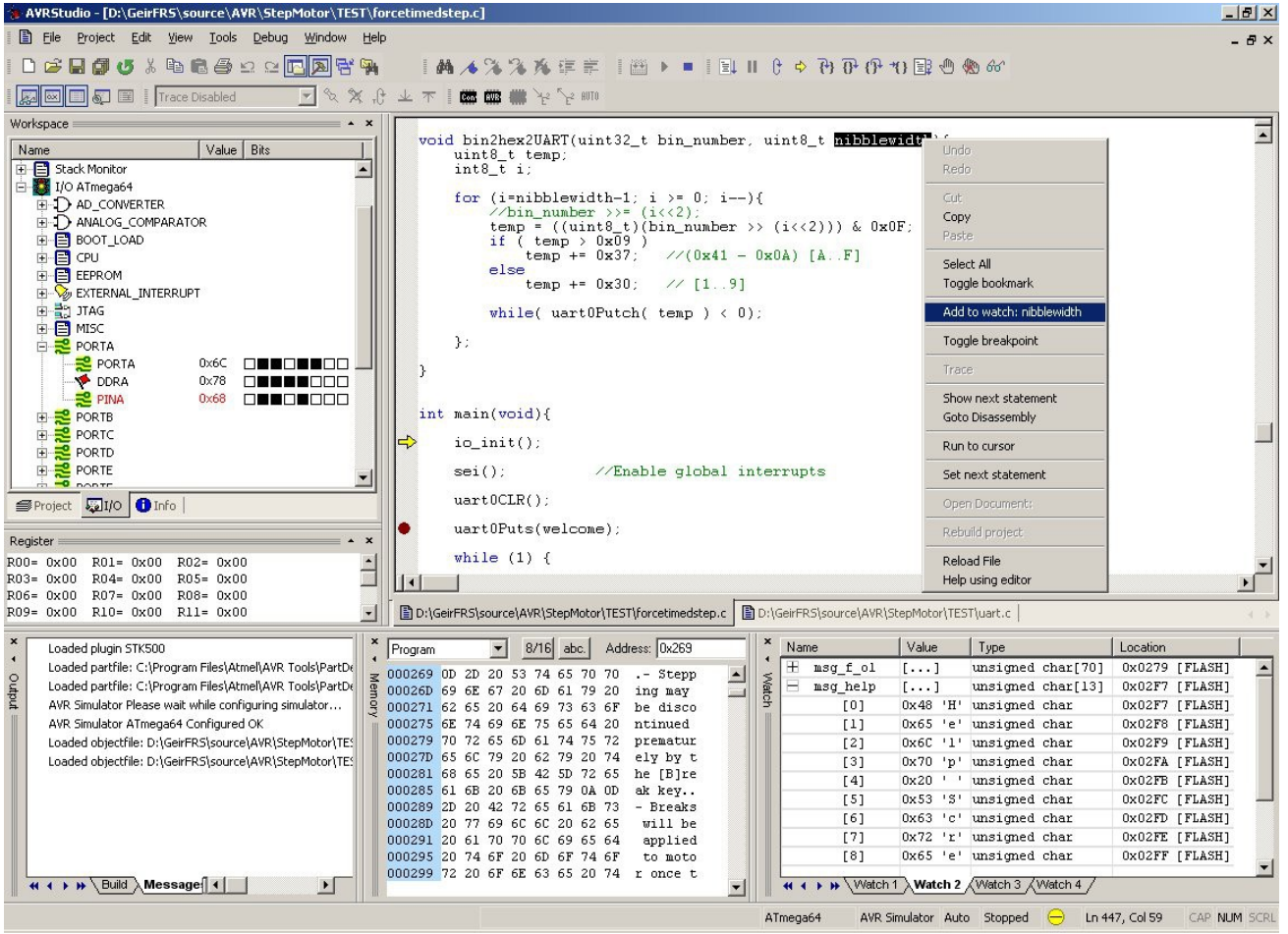
- assembler

- C

- BASIC

AVR Studio

AVR Studio is an Integrated Development Environment (IDE) for writing and debugging AVR applications in Windows 9x/ME/NT/2000/XP/VISTA /WIN 7 environments. AVR Studio provides a project management tool, source file editor, simulator,assembler and front-end for C/C++, programming, emulation and on-chip debugging.



AVR Studio 4 has a modular architecture which allows even more interaction with 3rd party software vendors. GUI plug-ins and other modules can be written and hooked to the system.

Installation

- **Requirements**

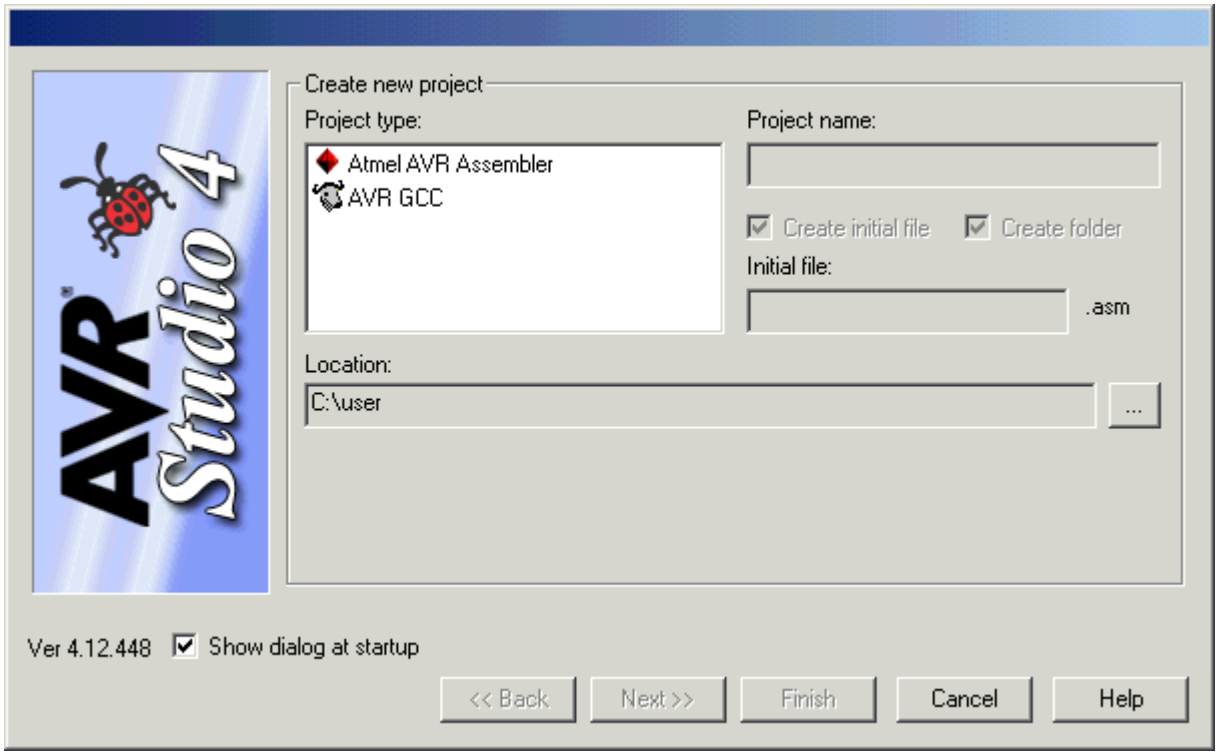
Windows 98/NT/2000/XP
XP x64/VISTA/WIN 7
Internet Explorer 6.0 or later
(Latest version is recommended)
Recommended hardware:
~ Intel Pentium 200MHz processor or equivalent
~ 1024x768 screen (minimum 800x600 screen)
~ 256 MB memory
~ 100 MB free hard disk space

Introduction

AVR Studio 4 is a large piece of software, it supports several of the phases you usually go through when you create a new product based on an AVR microcontroller.

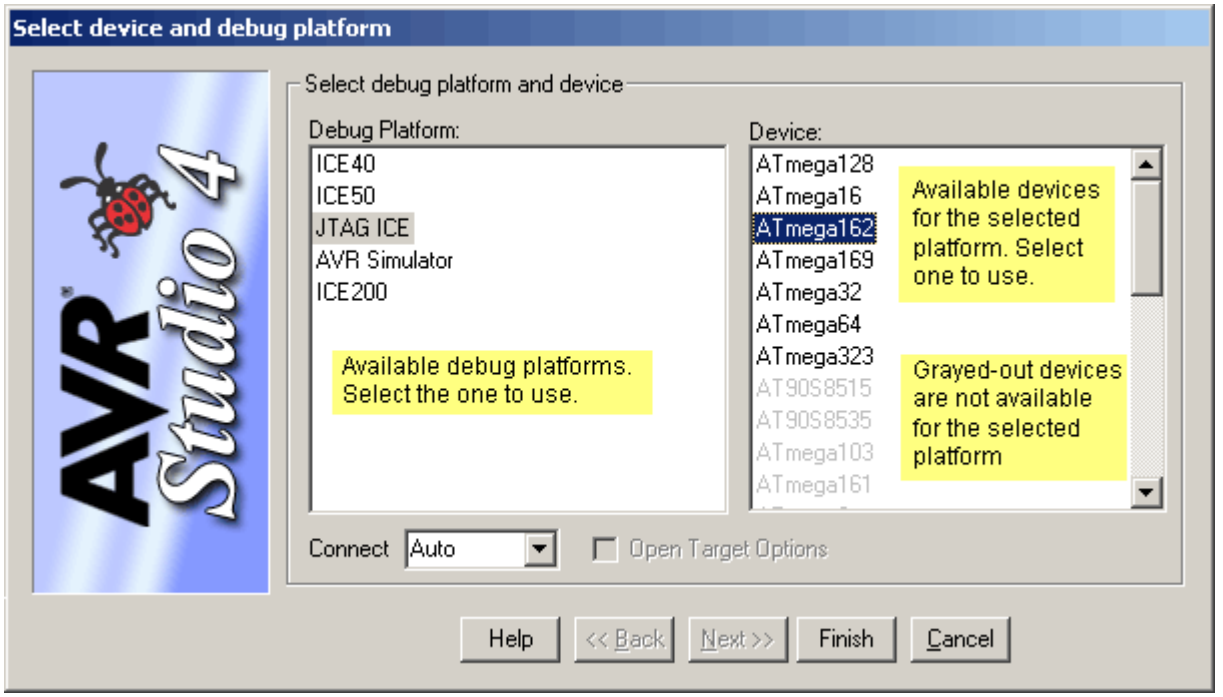
AVR Studio supports the developer in the design, development, debugging and verification part of the process.

New project

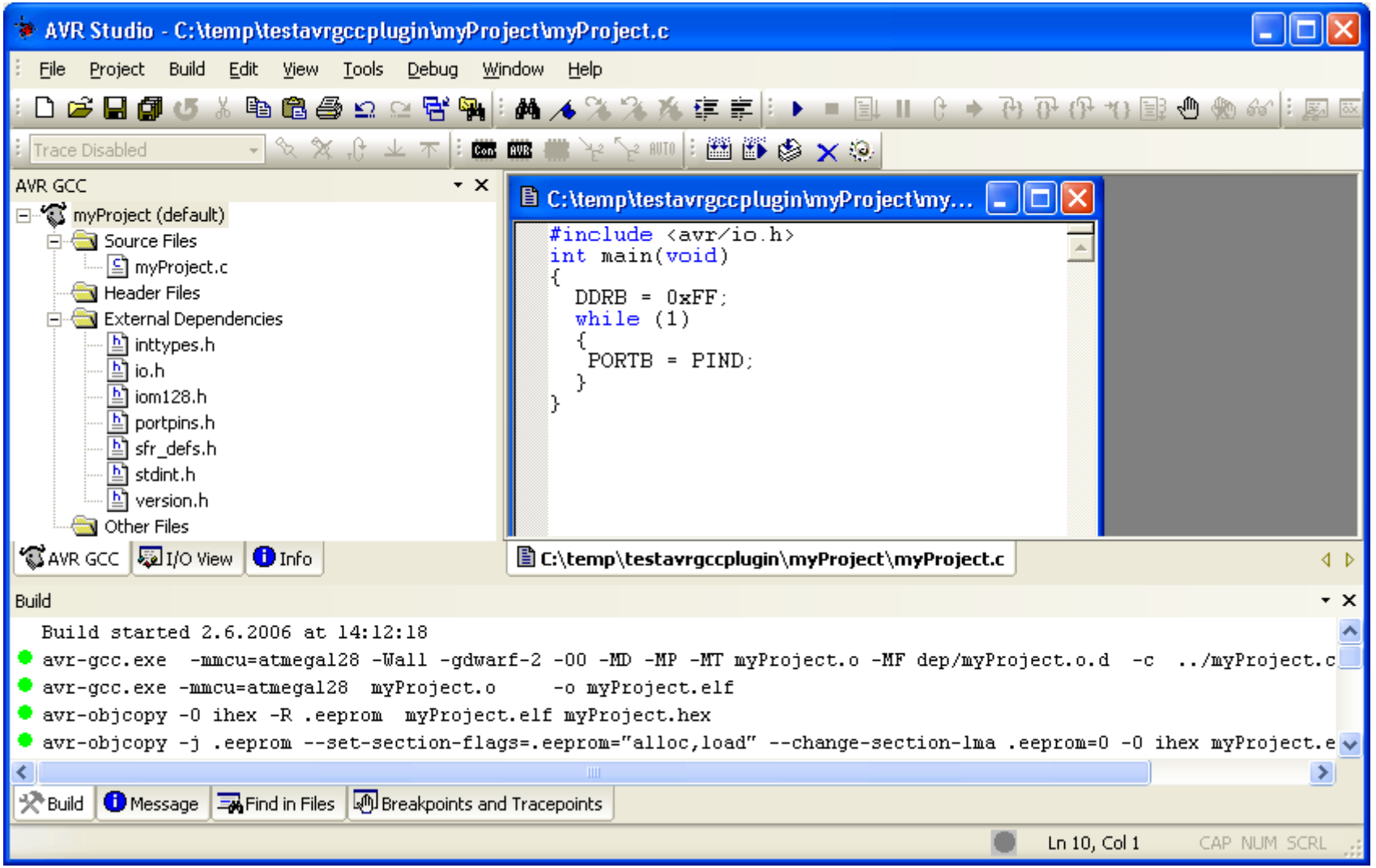


Select Project ->new project from the menu, and the dialog below will appear.
The startup wizard will also have this option.

•Device selection



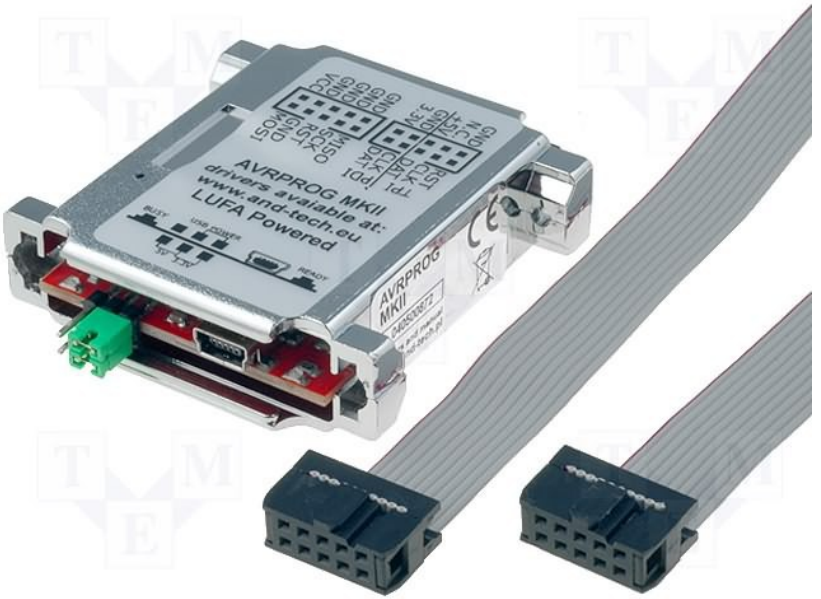
Debug platform and device selection can be done by selecting debug->Select debug platform and device. All on-system debug platforms and devices are listed.



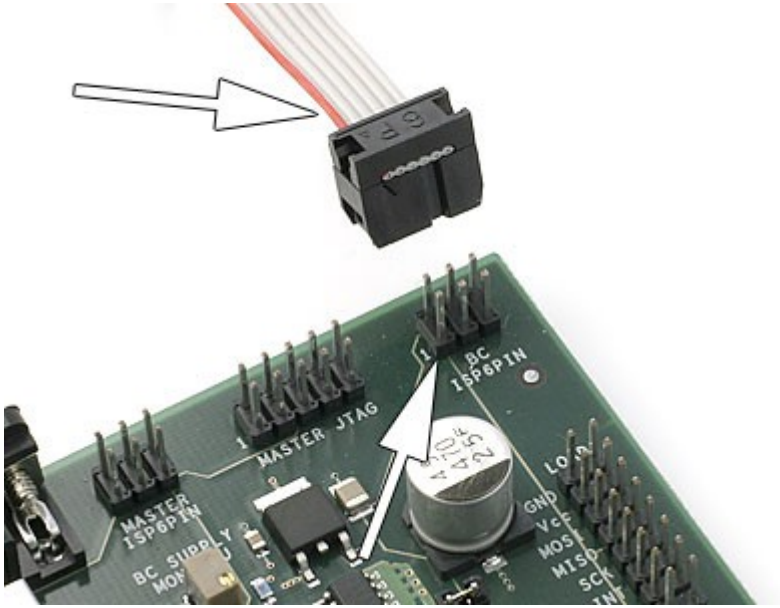
Now, write the code into the open editor window. You should now be ready to start debugging the code by pressing the 'start debugging button'.

AVRISP mkII Programator

The AVRISP mkII combined with AVR Studio can program all AVR 8-bit RISC microcontrollers with ISP and PDI Interface

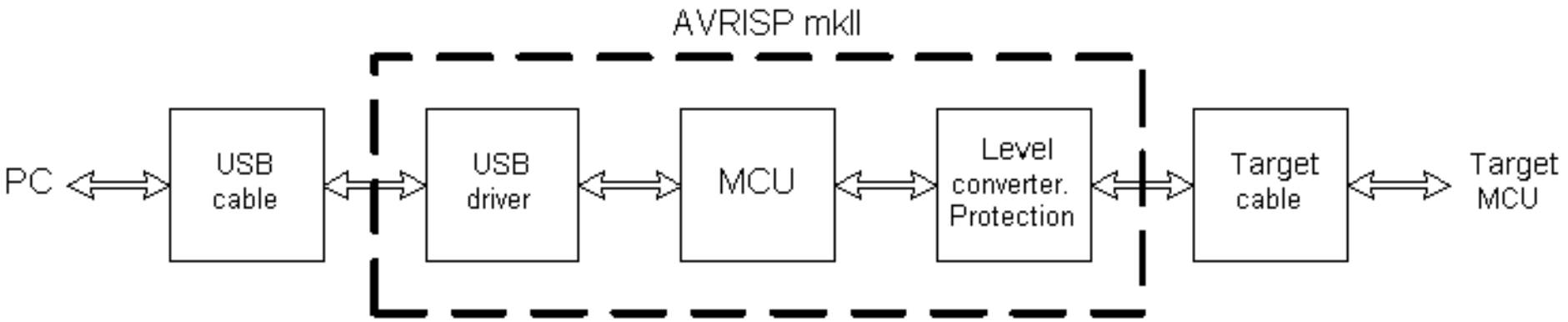


Connecting AVRISP mkII



After the AVRISP mkII is connected to the PC, it can be connected to the target. The red stripe on the target cable marks pin 1, and this should be mated with pin 1 on the ISP or PDI connector on the target board.

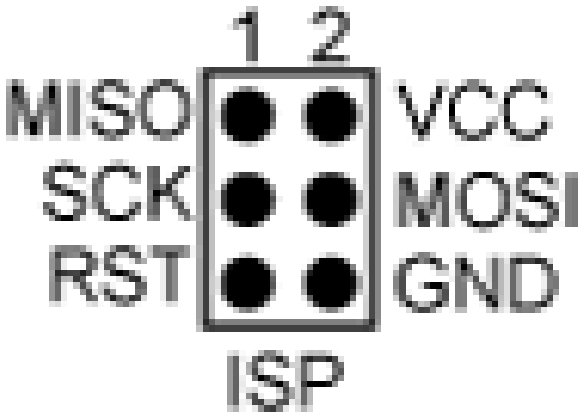
AVRISP mkII Block Schematic

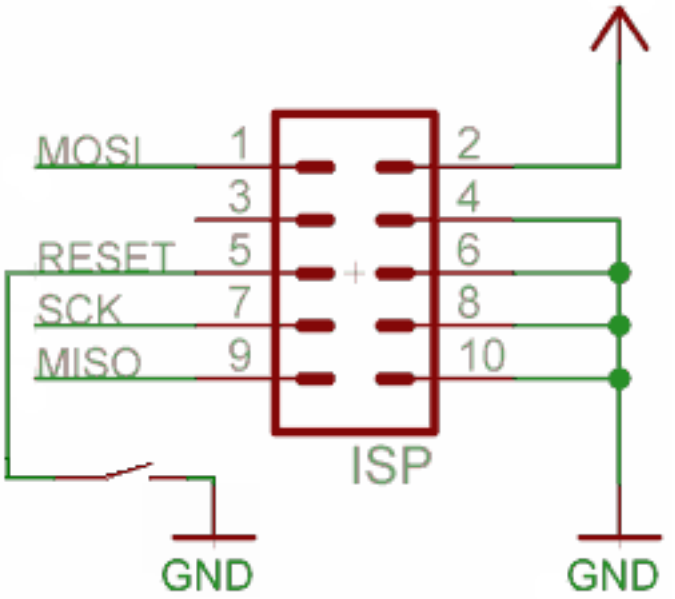


AVRISP mkII block diagram

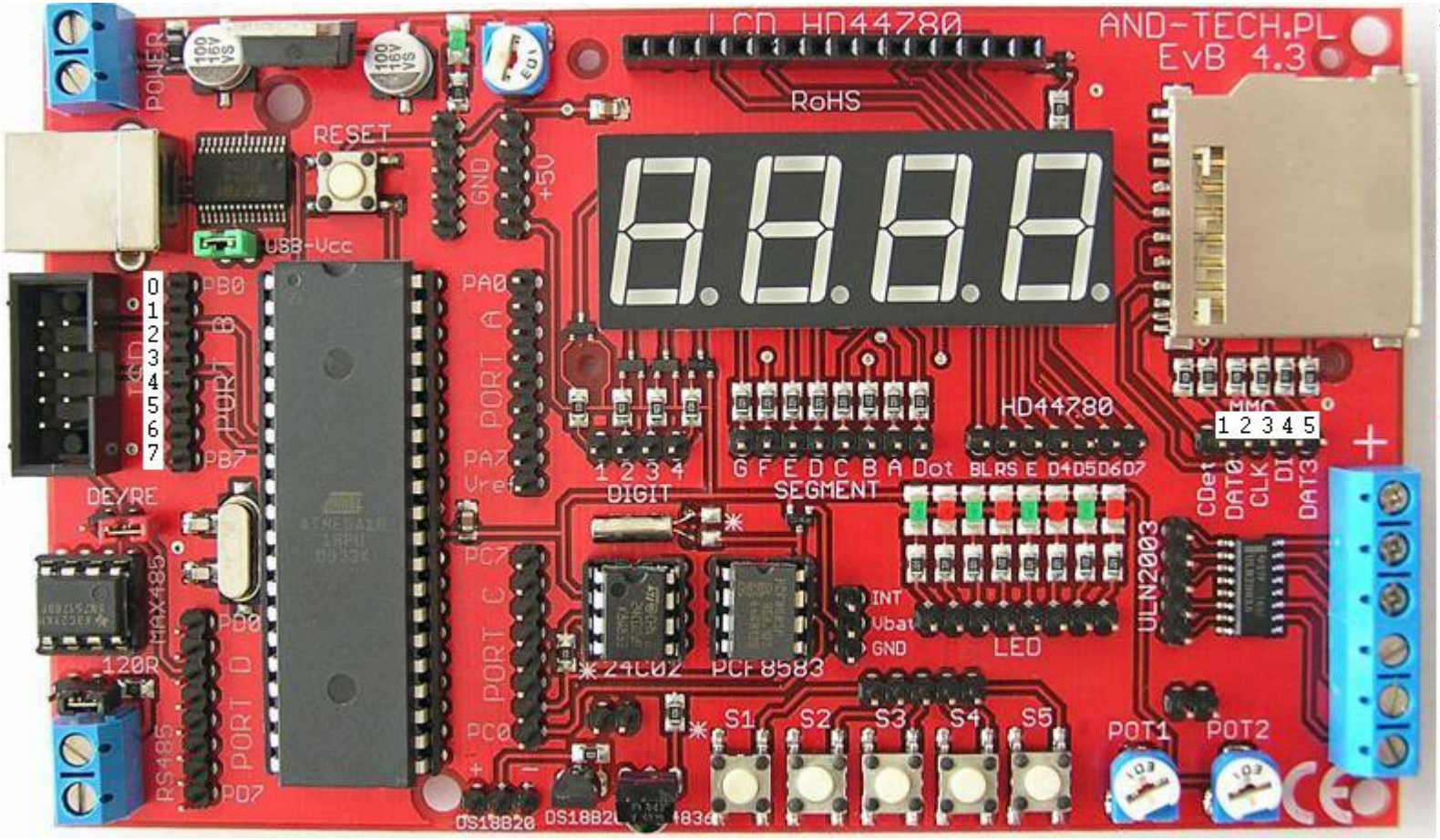
- ISP Interface

When programming an AVR with ISP interface, the connector must have the following pinout:
ISP connector





Microcontroller board devices

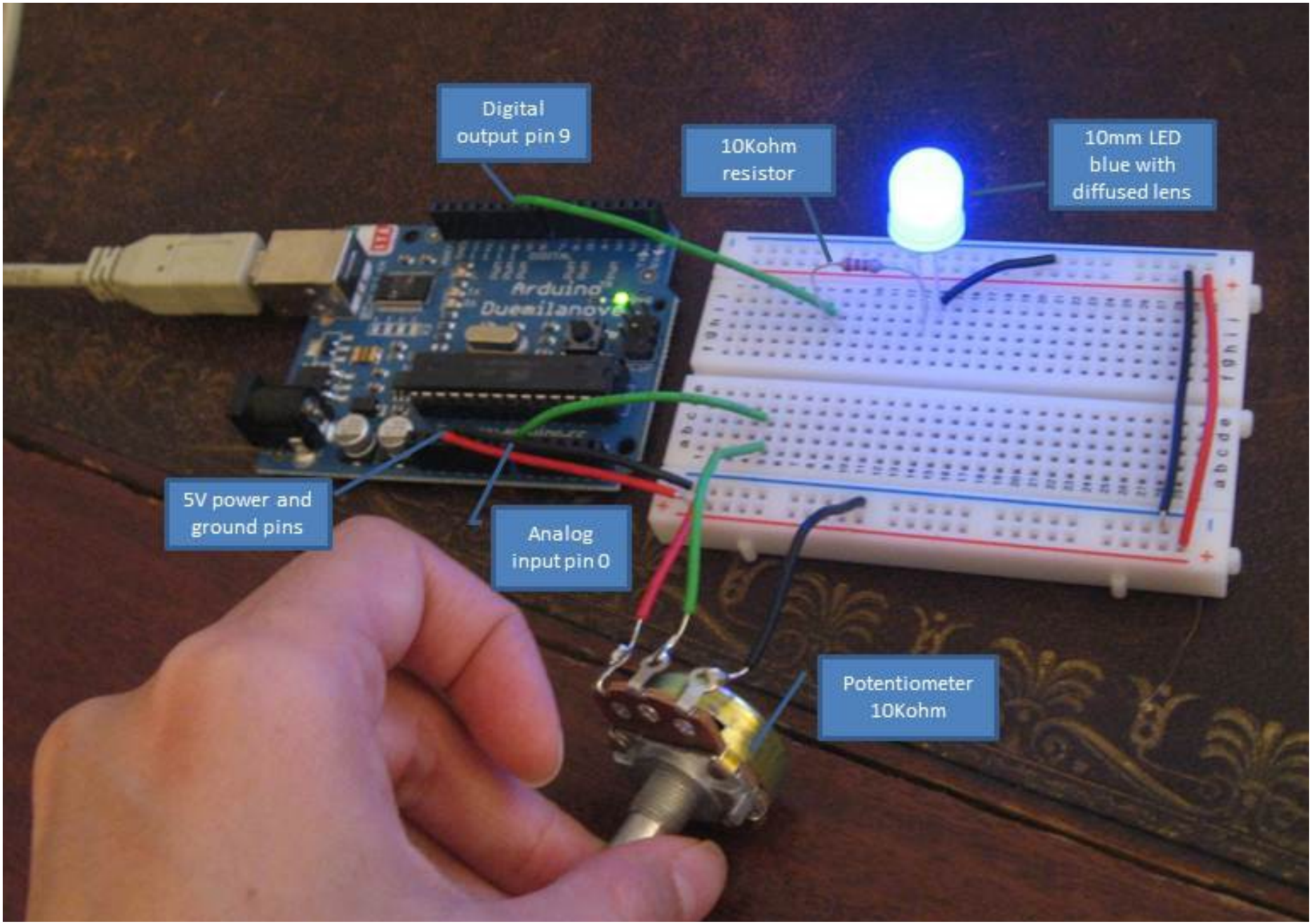


EvB

PB	4.3 MMC/SD	4.1 MMC/SD
0		
1		
2		
3	1 CDet	1 CDet
4	5 DAT3	5 CLK DAT3
5	4 DI	4 DI DI
6	2 DAT0	2 DAT0 DAT0
7	3 CLK	3 DAT3 CLK

labels mistake on pcb 4.1

Testing


Digital output pin 9
10Kohm resistor
10mm LED blue with diffused lens
5V power and ground pins
Analog input pin 0
Potentiometer 10Kohm