

# MINI-MAX/AVR-C

## Quick Start Guide

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## Overview

Thank you for your purchase of the MINI-MAX/AVR-C Single Board Computer. MINI-MAX/AVR-C is a general purpose, low-cost and highly expandable micro-controller system. It is based on the ATMEL ATMEGA2560 single-chip Flash micro-controller.

All MINI-MAX/AVR-C boards are shipped with a pre-programmed serial bootloader. This way the ATMEGA2560 Flash memory can be downloaded through a standard PC COM port. Through the boot loader, the MINI-MAX/AVR-C appears to AVR Studio and other development tools as the ATMEL STK500 board. If the bootloader is erased from ATMEGA2560 Boot Flash memory for any reason, please read the special document from BiPOM on how to restore the boot loader:

[http://www.bipom.com/documents/boards/mmavr/ATMEGA2560\\_bootloader.pdf](http://www.bipom.com/documents/boards/mmavr/ATMEGA2560_bootloader.pdf)

## Hardware Setup

Place the MINI-MAX/AVR-C Microcontroller board on a clean, non-conductive surface.

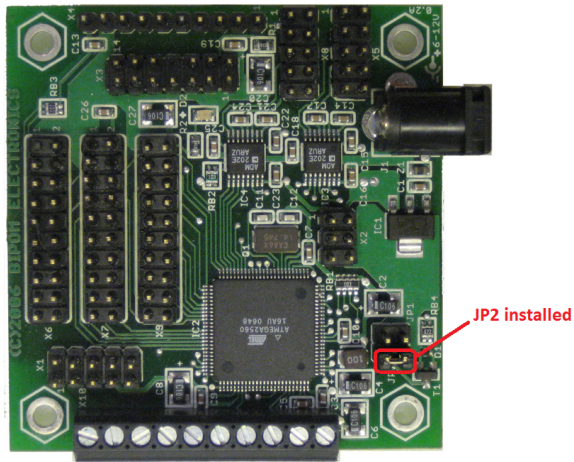
Connect the provided 6VDC power supply plug to the power jack on the MINI-MAX/AVR-C. Do not connect the power supply to the outlet yet.

Do not use a power supply other than one that is supplied or approved by BiPOM Electronics. Use of another power supply voids the warranty and may permanently DAMAGE the board or the computer to which the board is connected.

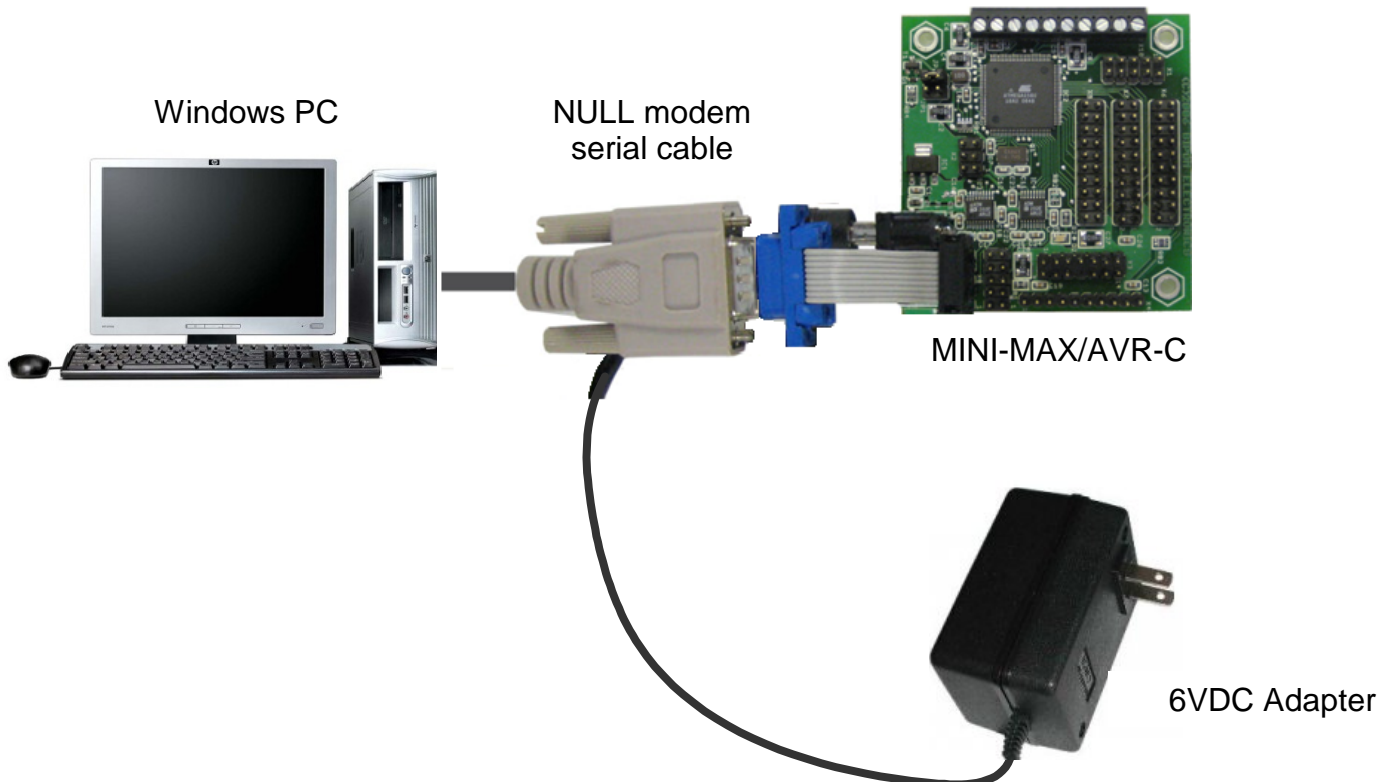
Connect the 10-pin header of serial cable to X5 connector (UART0) of MINI-MAX/AVR board.

Connect the other end of the serial cable to your PC's COM port.

Make sure that JP2 jumper is installed so PC can download programs to the board.



Connect the 6VDC power supply to a wall outlet. Red LED on MINI-MAX/AVR-C board will turn ON.



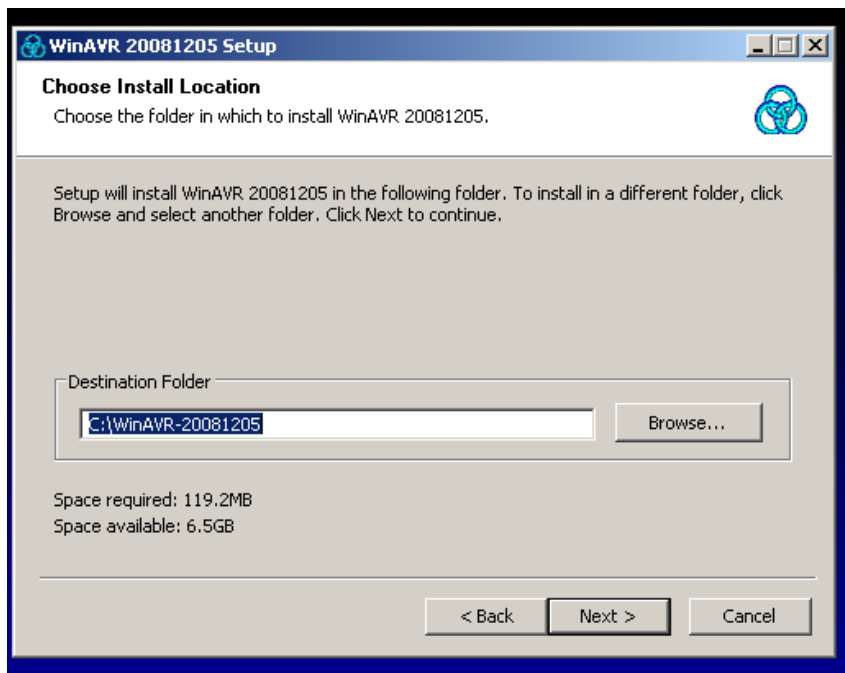
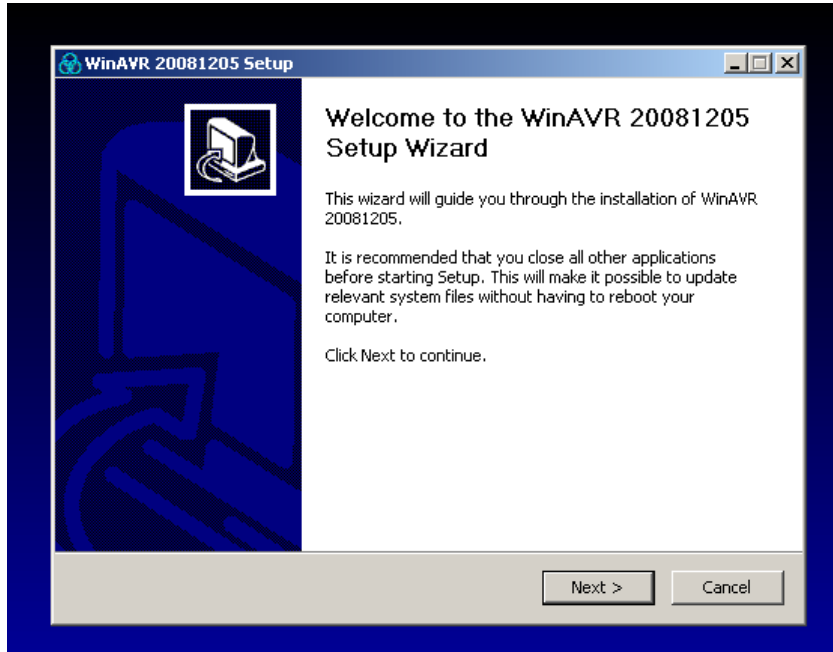
## **Tools**

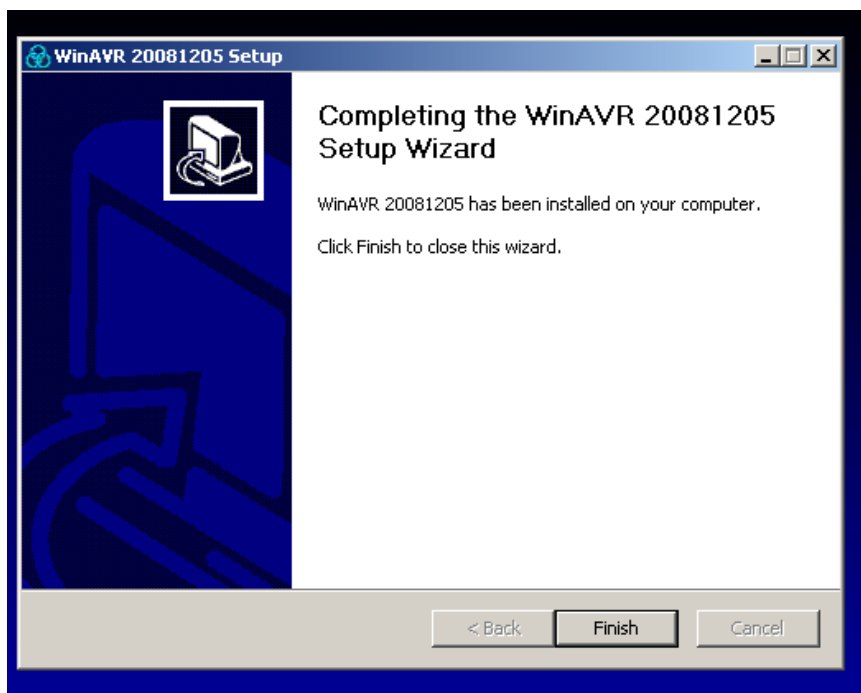
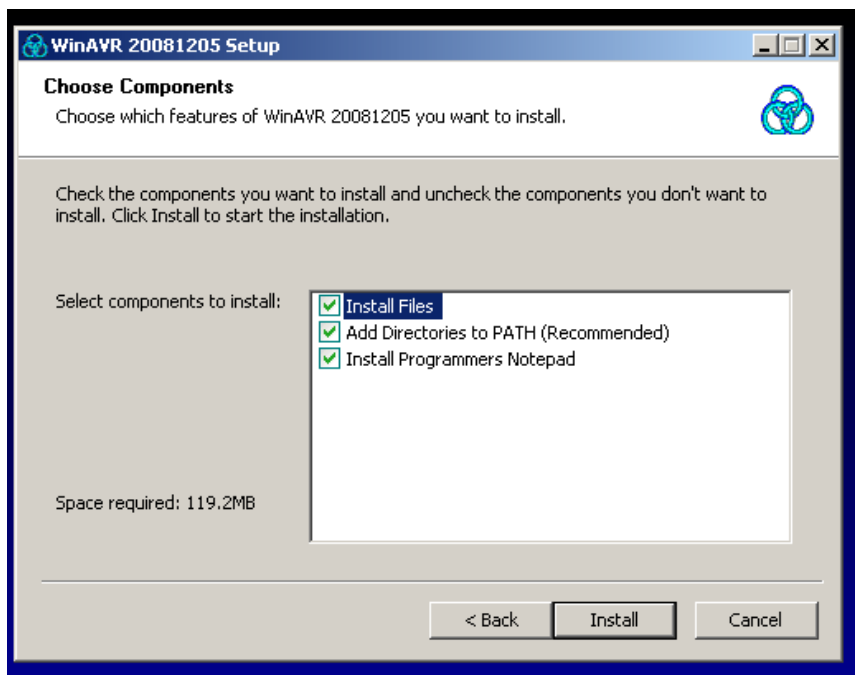
WinAVR (TM) is a suite of executable, open source software development tools for the Atmel AVR series of RISC microprocessors hosted on the Windows platform. WinAVR includes the GNU GCC compiler for C and C++.

AVR Development System from BiPOM includes Micro-IDE which is a Windows-based Integrated Development Environment for micro-controller application development. Micro-IDE has a built-in terminal window to interact with MINI-MAX boards through a PC COM port.

## Software Setup

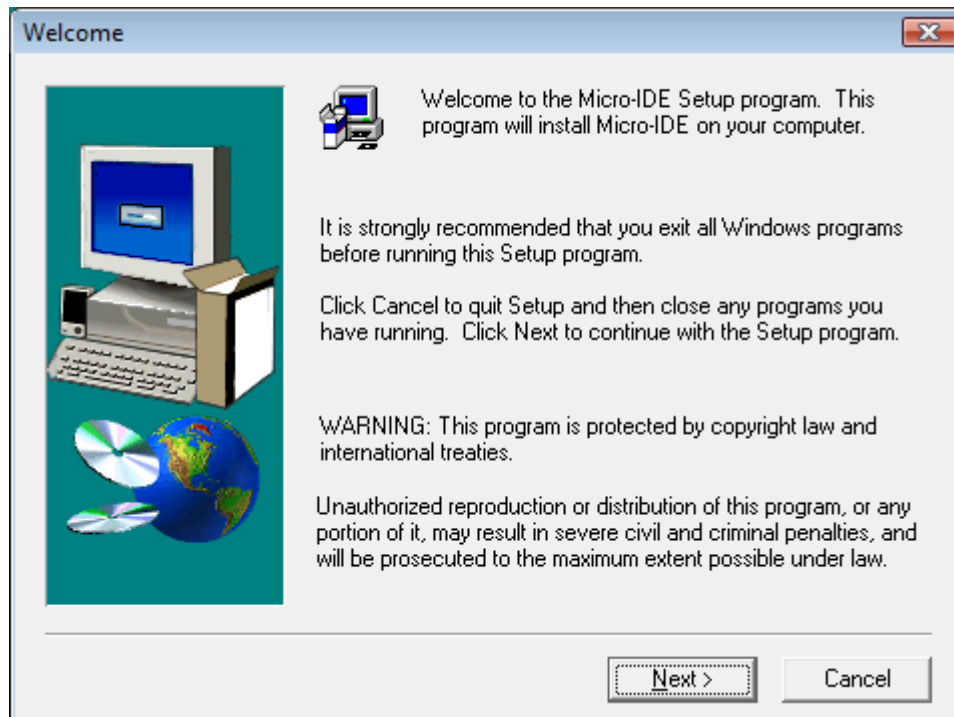
Download and install WinAVR C Compiler from [http://www.bipom.com/avrdev\\_down.php](http://www.bipom.com/avrdev_down.php)



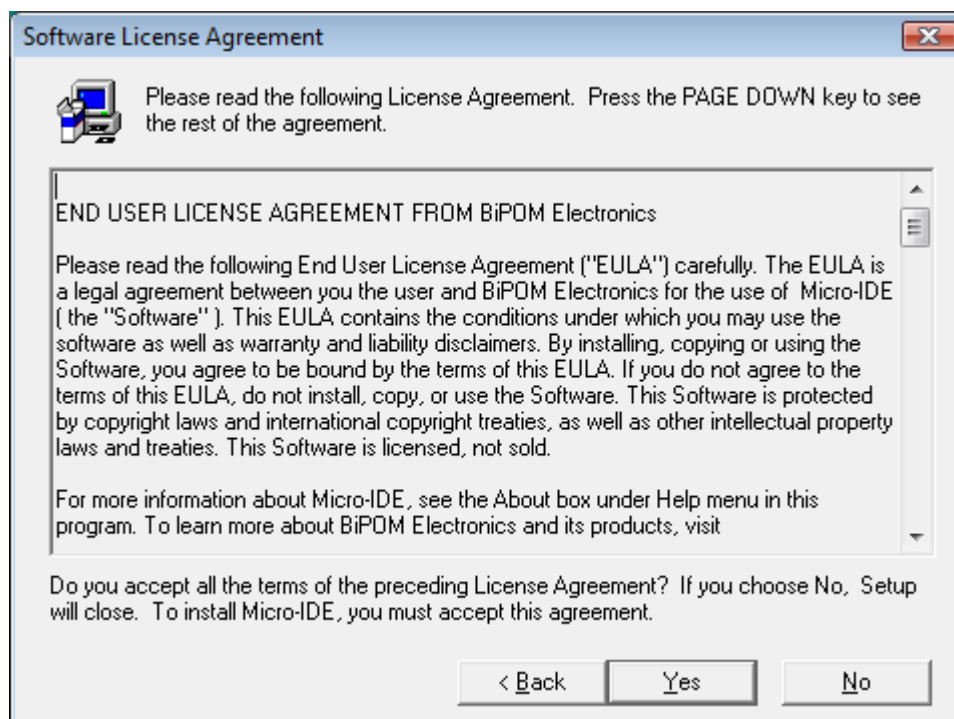


Download and install the AVR Development System from [http://www.bipom.com/avrdev\\_down.php](http://www.bipom.com/avrdev_down.php)

Execute the downloaded **avr\_devsys.exe** to start the installation. A welcome screen will appear:

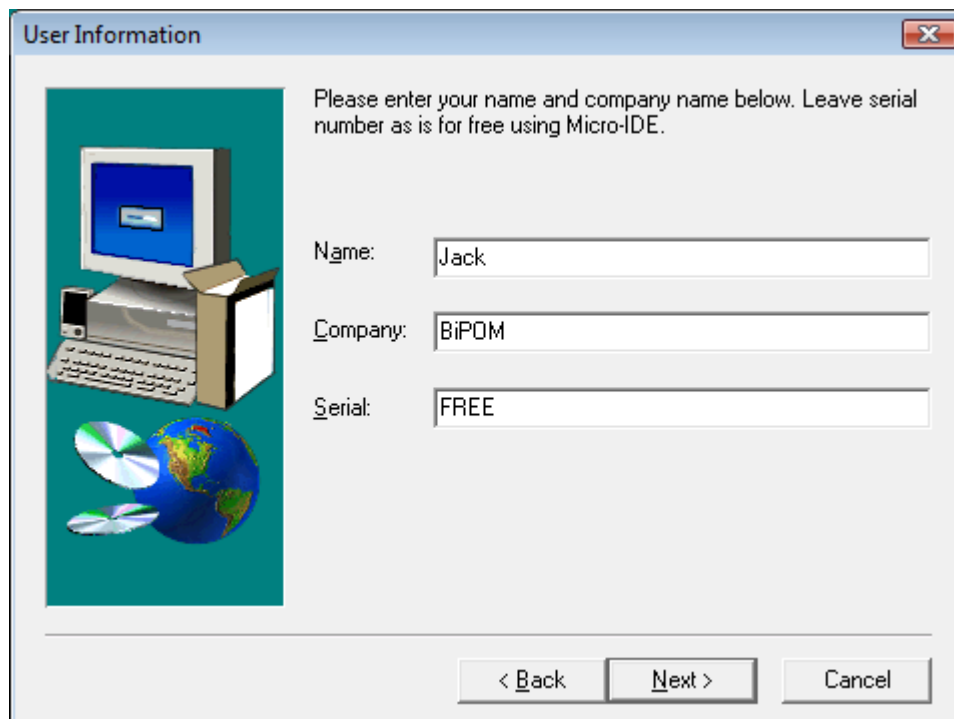


Click Next. End User Agreement will appear:



Please read the agreement and click Yes to continue.

Enter your name, company and 'FREE' as a serial number. Then click the Next button.



The 'User Information' dialog box has a title bar with a close button. On the left is a graphic showing a computer monitor, keyboard, and CD-ROMs. The main text area contains the instruction: 'Please enter your name and company name below. Leave serial number as is for free using Micro-IDE.' Below this are three text input fields: 'Name:' with 'Jack', 'Company:' with 'BIPOM', and 'Serial:' with 'FREE'. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

User Information

Please enter your name and company name below. Leave serial number as is for free using Micro-IDE.

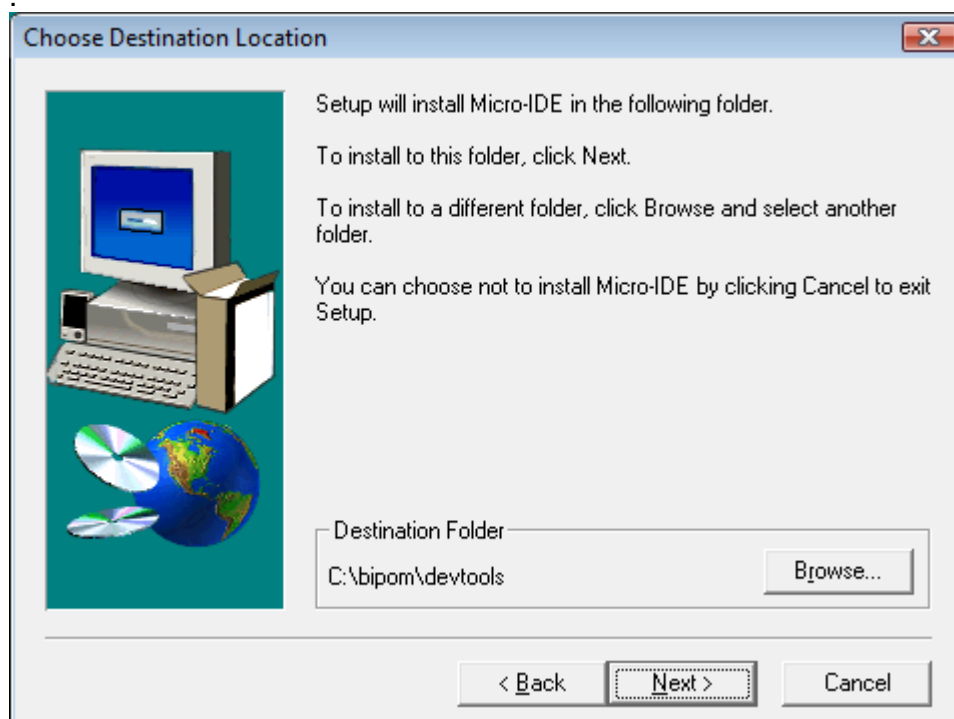
Name: Jack

Company: BIPOM

Serial: FREE

< Back Next > Cancel

Select the disk location where the software has to be installed. The default location ***c:\bipom\devtools*** is recommended. Click Next to start the installation:



The 'Choose Destination Location' dialog box has a title bar with a close button. On the left is the same graphic as the first dialog. The main text area contains instructions: 'Setup will install Micro-IDE in the following folder. To install to this folder, click Next. To install to a different folder, click Browse and select another folder. You can choose not to install Micro-IDE by clicking Cancel to exit Setup.' Below this is a 'Destination Folder' label followed by a text box containing 'C:\bipom\devtools' and a 'Browse...' button. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

Choose Destination Location

Setup will install Micro-IDE in the following folder.

To install to this folder, click Next.

To install to a different folder, click Browse and select another folder.

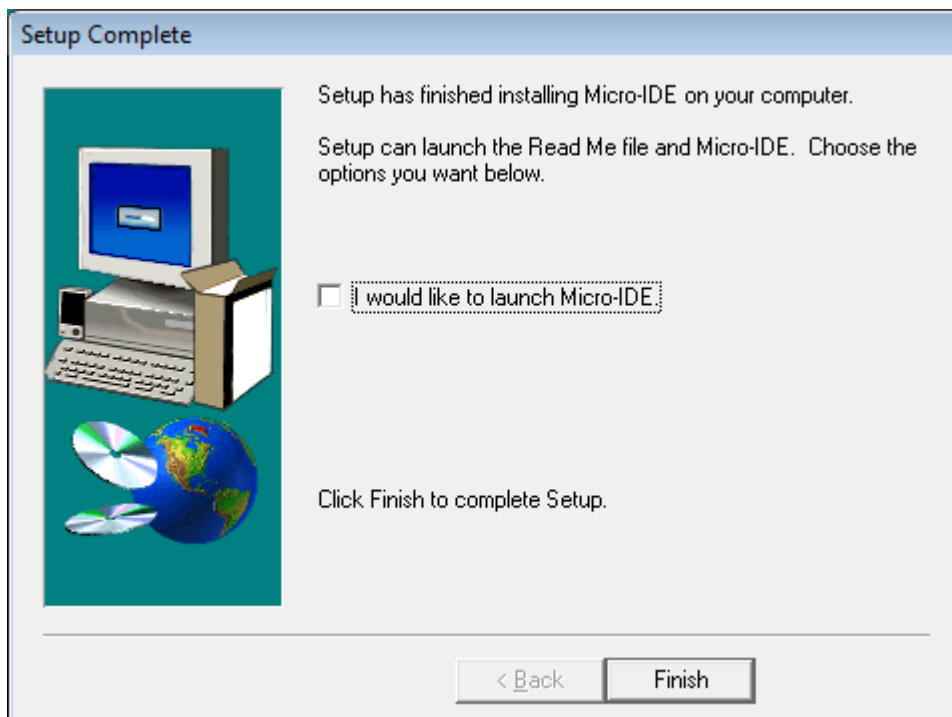
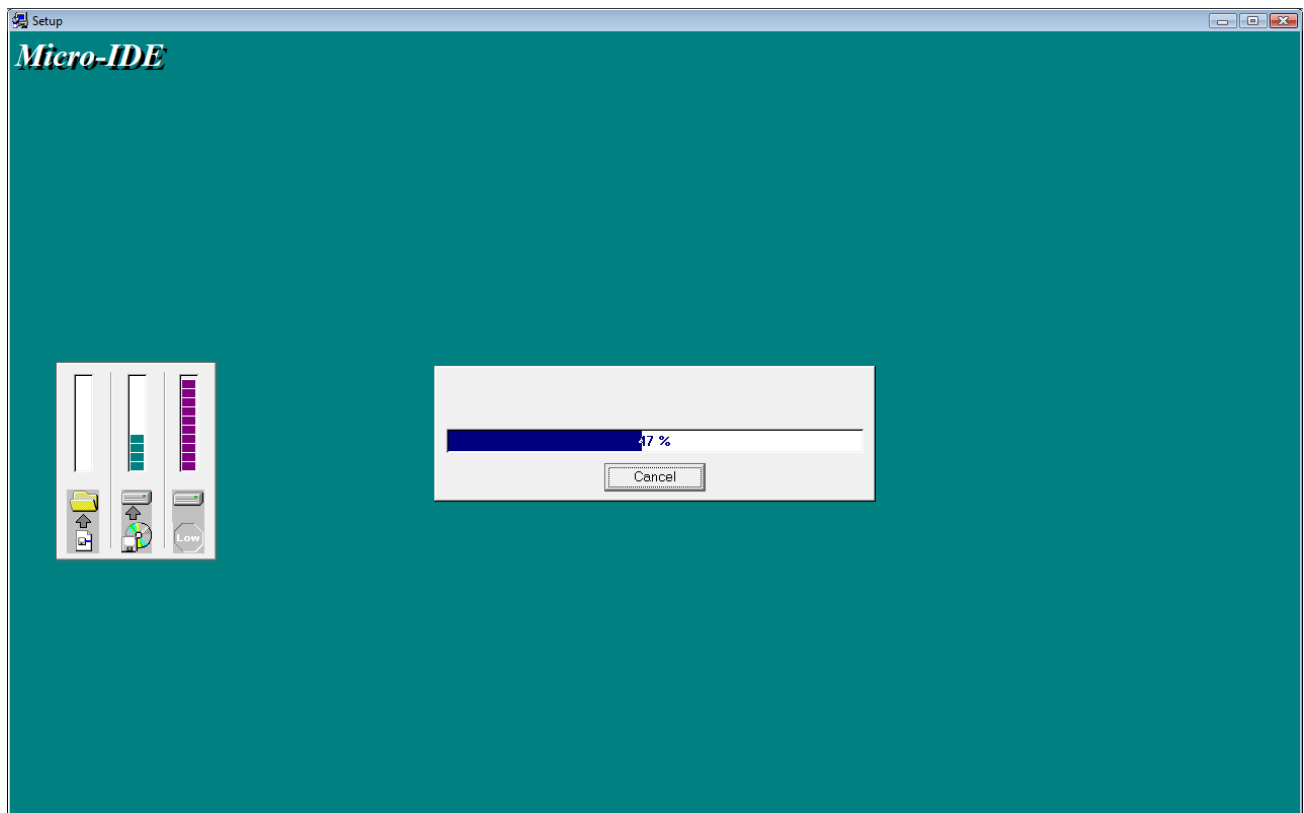
You can choose not to install Micro-IDE by clicking Cancel to exit Setup.

Destination Folder

C:\bipom\devtools Browse...

< Back Next > Cancel





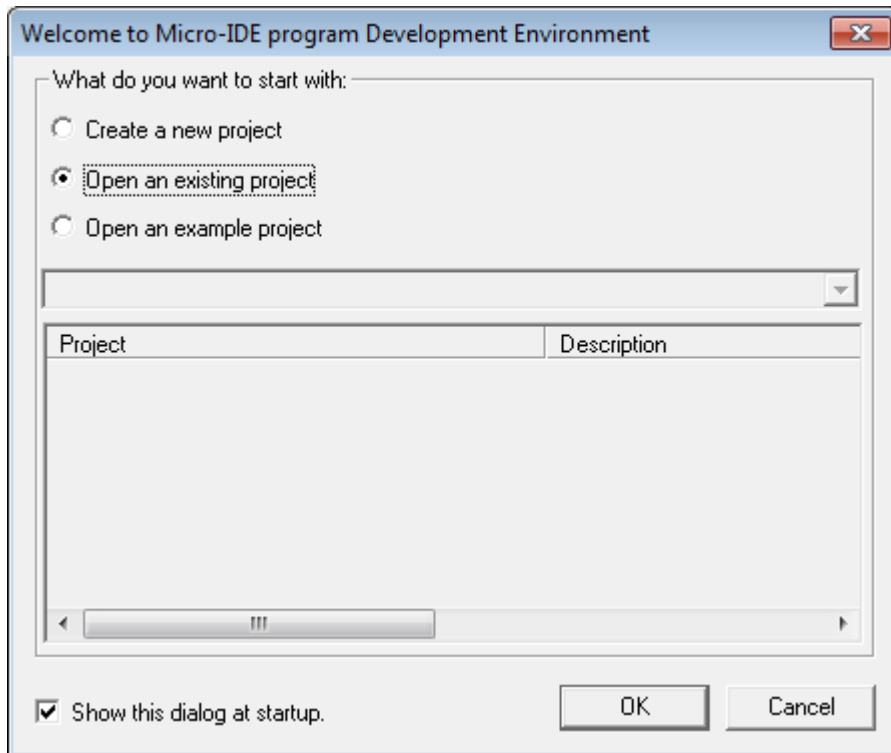
Uncheck the "I would like to launch Micro-IDE" option and click the Finish button.

## Downloading Example Programs

After installing the software, you can build programs and download programs to the board. Follow the steps below:

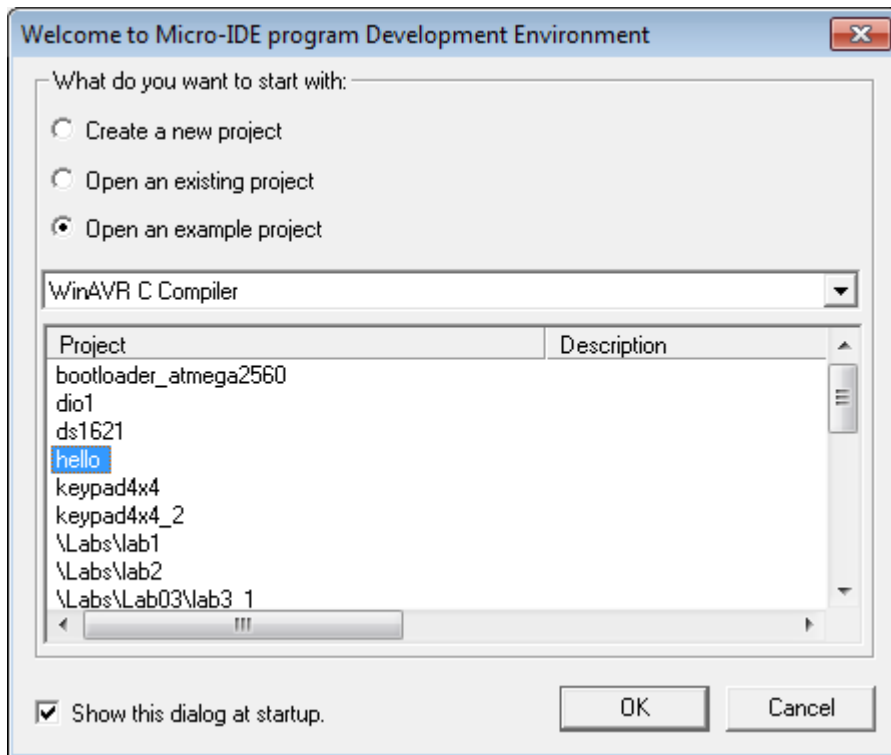
Make sure the board is powered and connected to the PC as described in the section **Installing the Hardware**.

Run Micro-IDE from Windows Start menu. When Micro-IDE is started, the Project selection window appears:

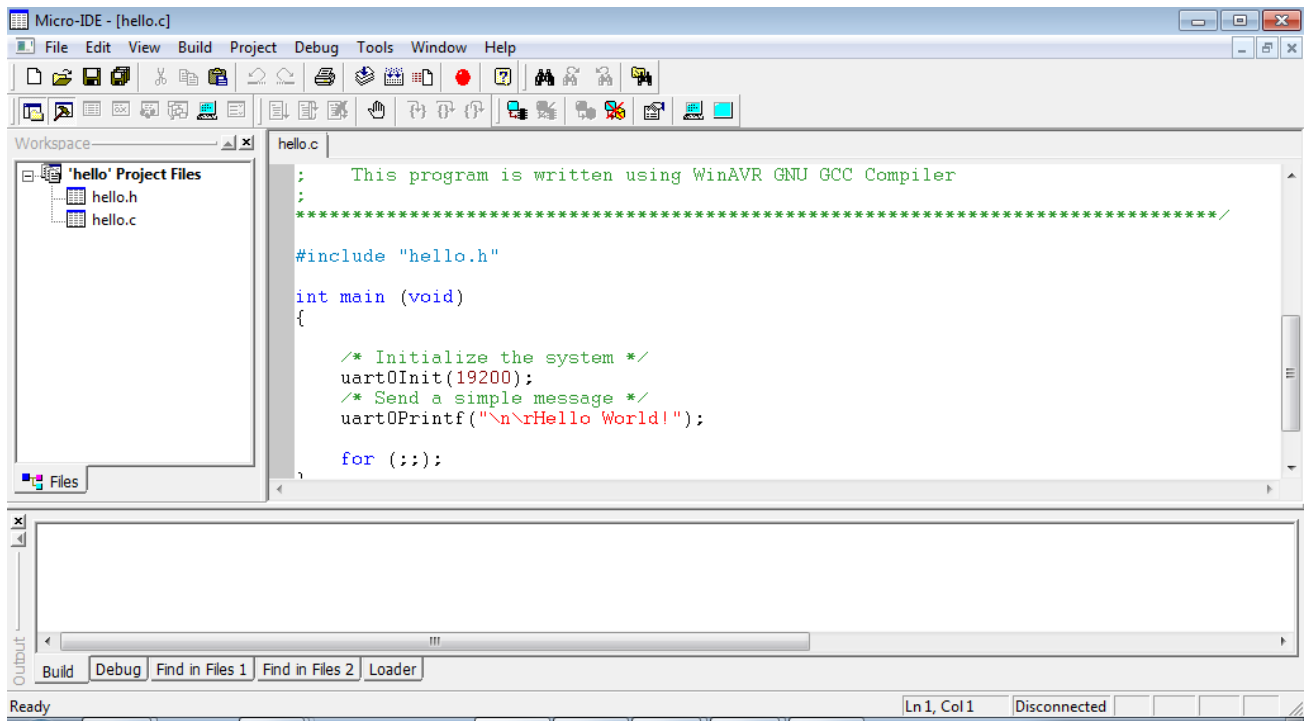


Micro-IDE is distributed with several example programs that show how to program the ATMEGA2560 microcontroller. Example projects are located under the **Examples** folder under the folder where you installed Micro-IDE.

Select **Open an Example Project** option:



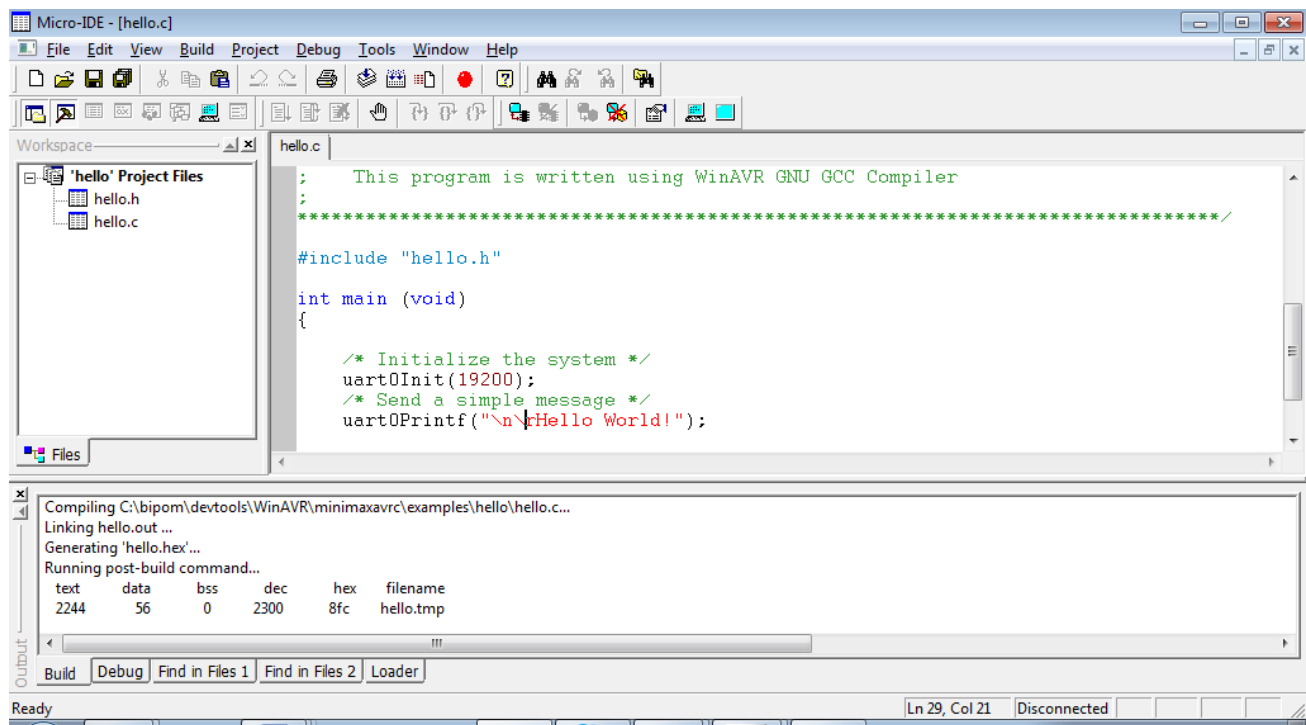
Select **hello** project and click OK.



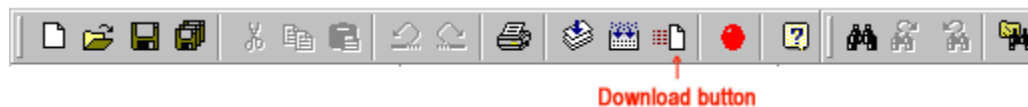
Click the Build button on the main toolbar. This will build the Hello project:



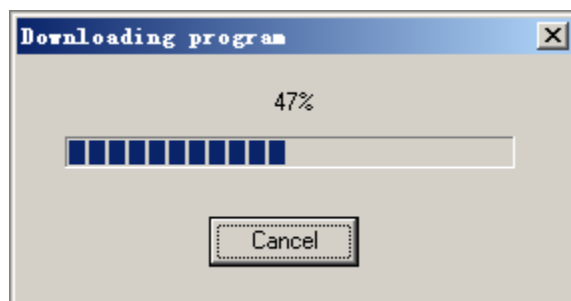
If the project builds successfully, you should see a message indicating no errors on the Output Window:



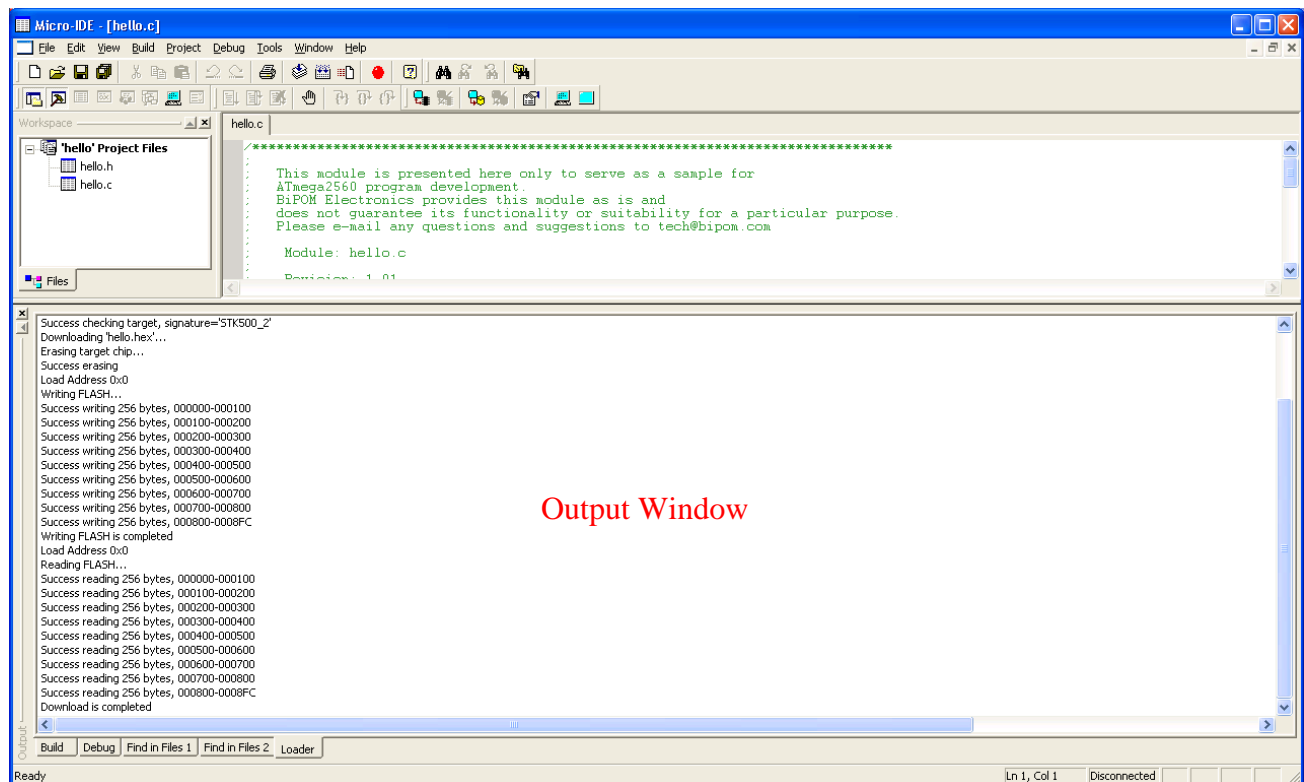
Download the executable (hello.hex) file to the board by selecting Download under Build menu:



If the MINI-MAX/AVR-C board is powered and connected properly to the PC serial port, a progress dialog will appear:

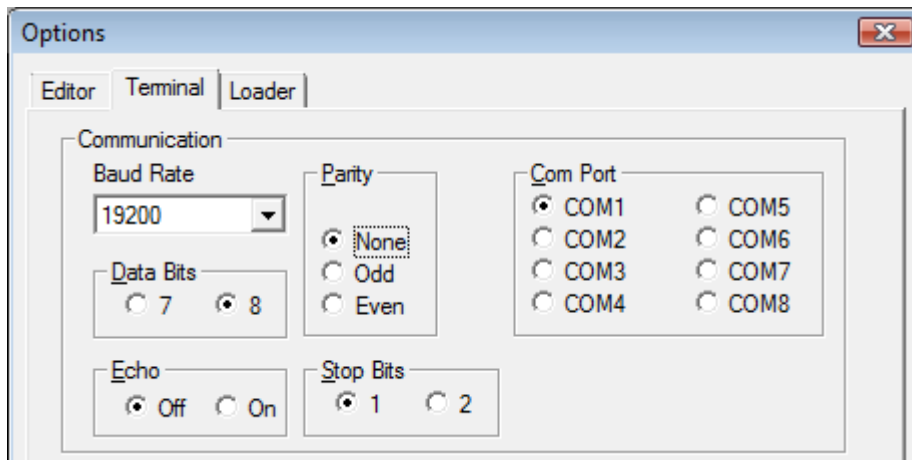


The progress dialog will disappear following a successful download. Details of the download are shown on the Output Window:



As can be seen from the Output Window messages, the downloader downloads the program to the microcontroller 256 bytes at a time.

To see the messages that the board prints to the serial port, Micro-DE terminal window is used. From the menu, select Options->Terminal:

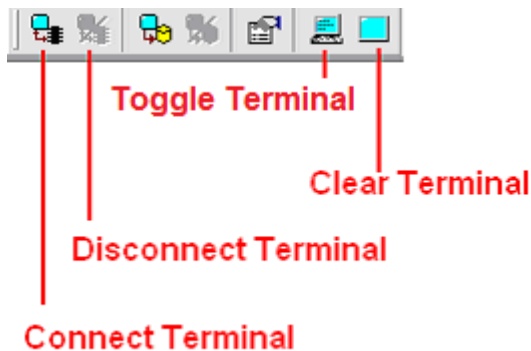


Select the correct PC COM port you have connected the MINI-MAX/AVR-C board. The following settings match the example we run on the MINI-MAX/AVR-C:

**Baud rate:** 19200  
**Parity:** None  
**Data Bits:** 8  
**Stop bits:** 1  
**Echo:** Off

Click the OK button.

Open the terminal window using the Toggle Terminal icon button



**Connect Terminal** connects the terminal window to the PC COM port. If a board sends data to the serial port, the messages will appear in Terminal window.

**Disconnect Terminal** disconnects the terminal window from the PC COM port.

**Toggle Terminal** shows/hides the terminal window.

**Clear Terminal** clears all messages in the terminal window.

Click the Connect icon button to connect the terminal window to the board.



Connect Button

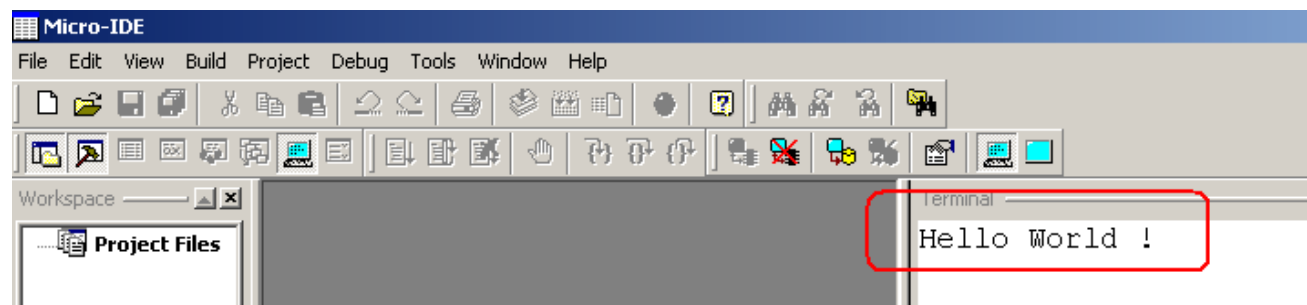
After the program has been successful downloaded, it can be started using the Mode button on the main Toolbar:



Mode button

The Mode button is Red in Program mode and Green in Run mode. Following a download, the Mode button will be Red. Click the Mode button to change the mode to Run mode. The program **hello.c** that you just downloaded starts executing.

The “Hello World!” message appears in the terminal window.



Congratulations!!! You have created and executed your first program on the MINI-MAX/AVR-C. J