BASCOM51

Quick Start Guide

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1. Hardware Setup

1. Please follow the hardware setup instructions below to use BASCOM51 with BiPOM's MINI-MAX/51 boards. For using BASCOM51 with other 8051 hardware, please follow the hardware setup and download instructions that apply to your hardware.

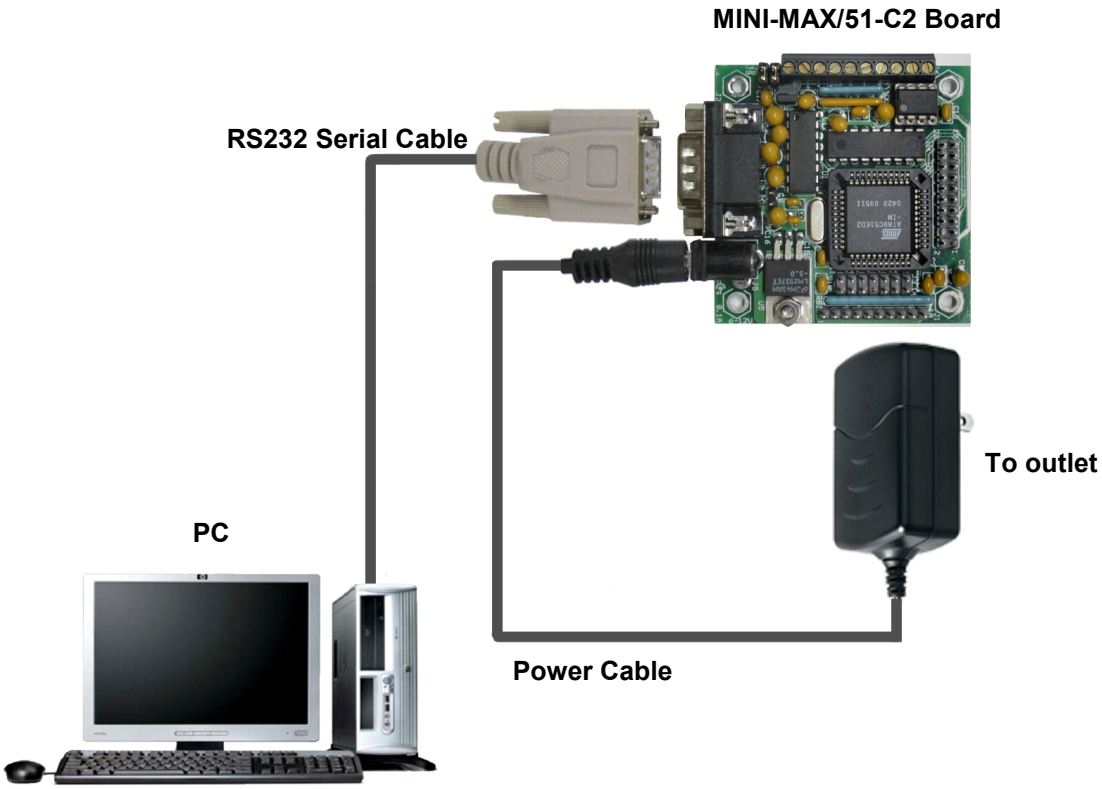
2. Place the MINI-MAX/51-C2 Microcontroller board on a clean, non-conductive surface.

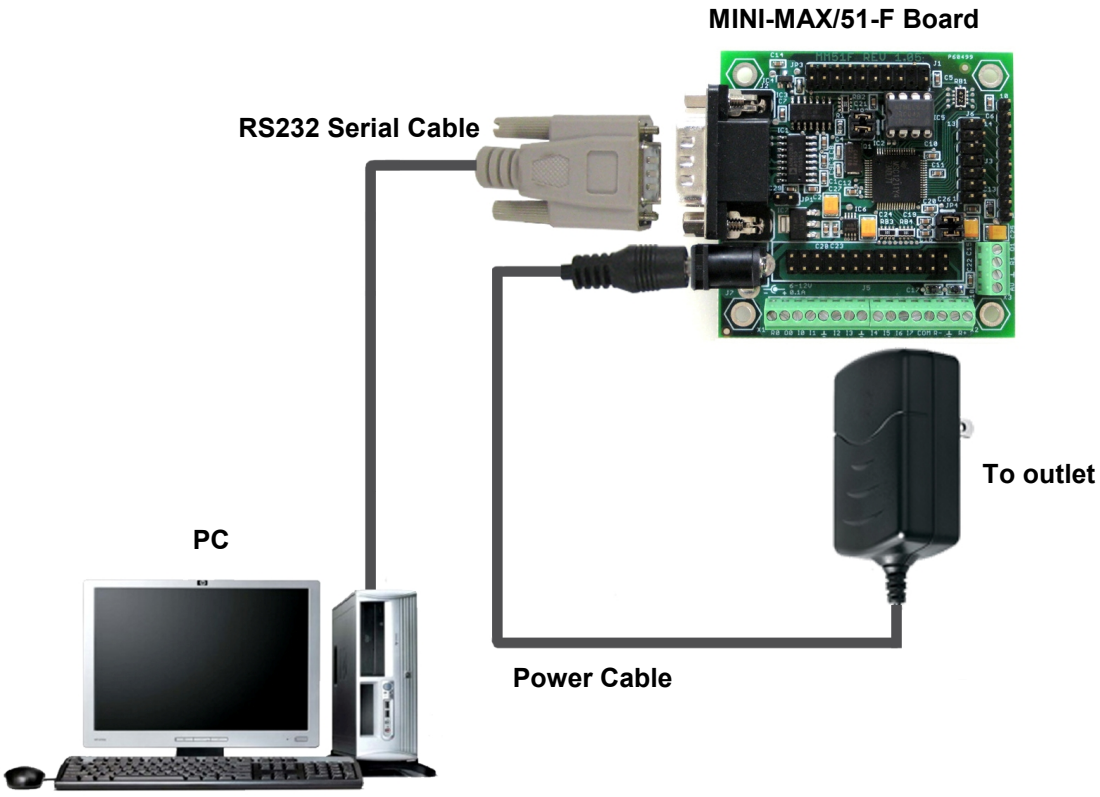
3. Connect the provided 6VDC power supply plug to the power jack on the MINI-MAX/51-C2. Do not connect the power supply to the outlet yet.

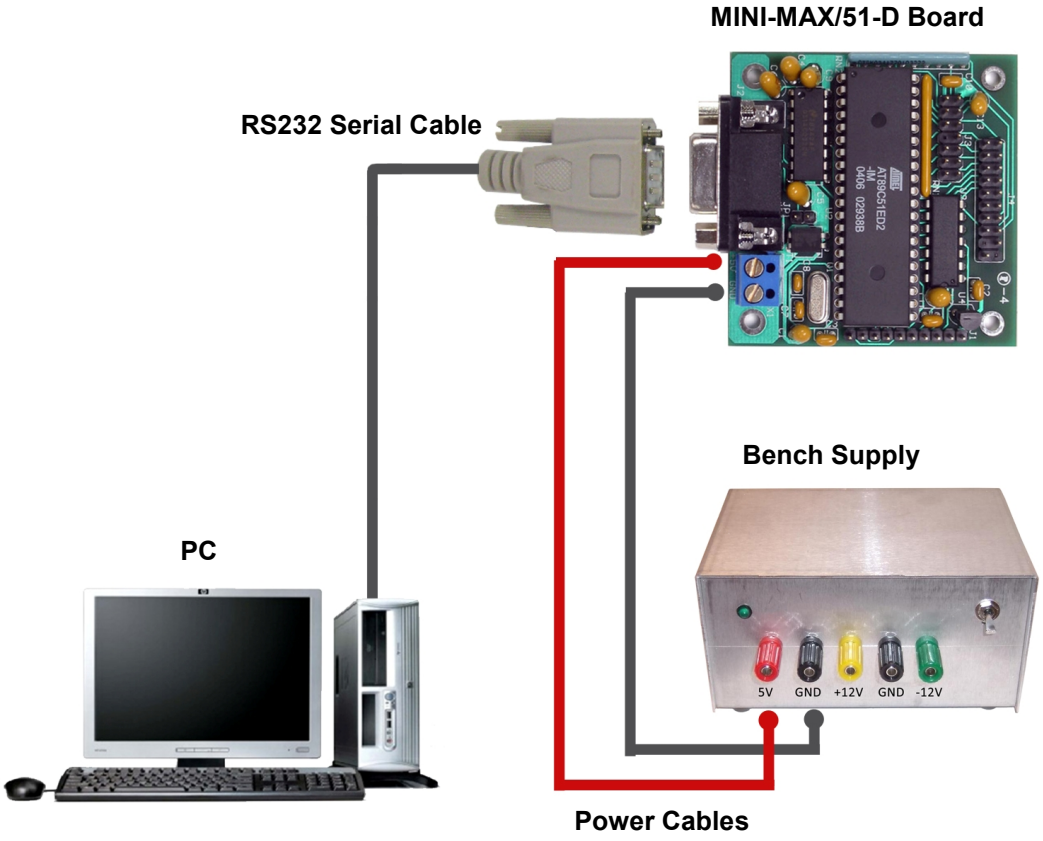
CAUTION: Do not use a power supply other than one that is supplied or approved by BiPOM Electronics. Use of another power supply voids the warranty and may permanently DAMAGE the board or the computer to which the board is connected !!!

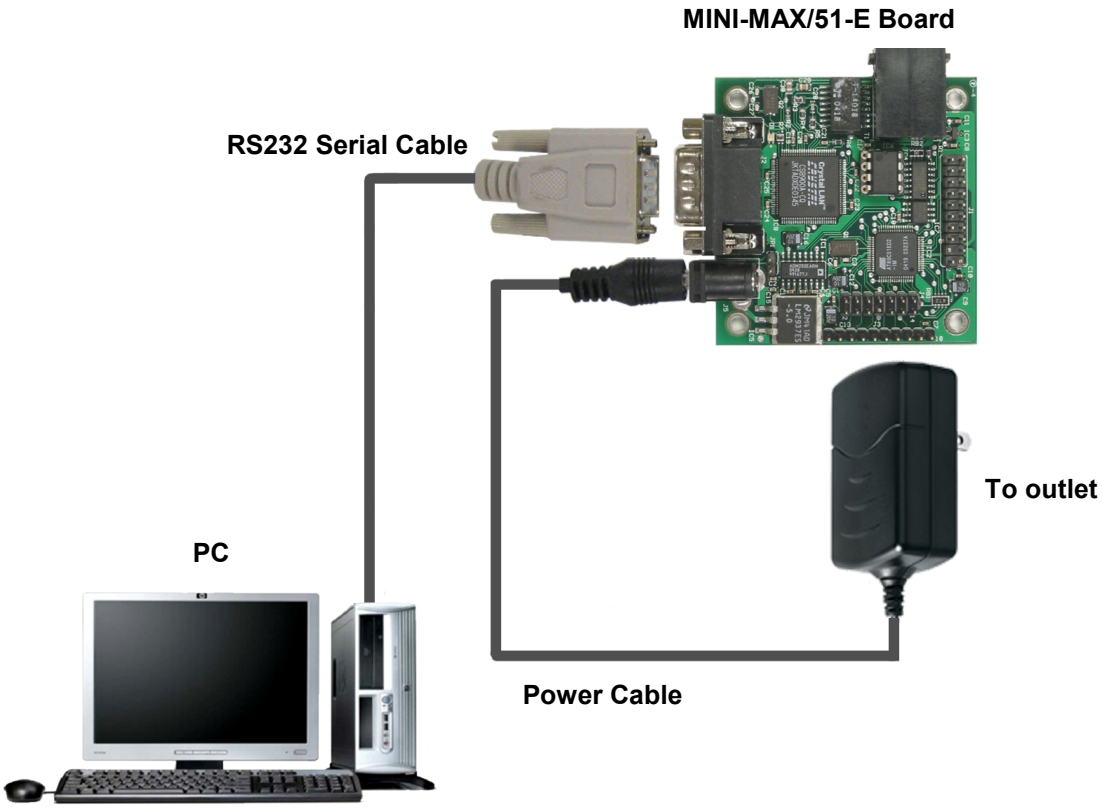
4. Connect the MINI-MAX/51-C2 to an available serial port on the PC using the supplied serial cable as shown below.

5. Connect the 6VDC power supply to a suitable wall outlet.




MINI-MAX/51-F Board
RS232 Serial Cable
To outlet
PC
Power Cable


MINI-MAX/51-D Board
RS232 Serial Cable
Bench Supply
PC
5V
GND
+12V
GND
-12V
Power Cables

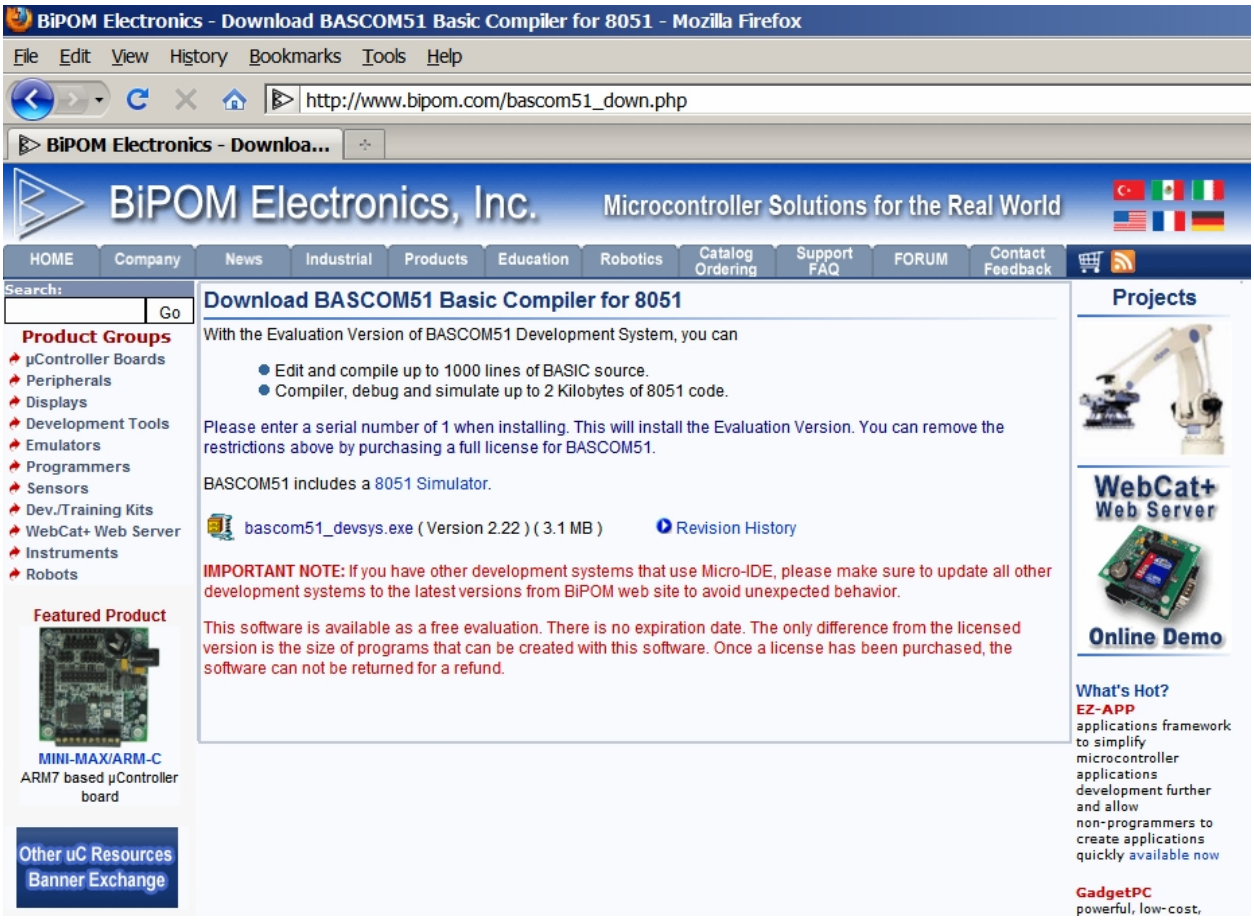

MINI-MAX/51-E Board
RS232 Serial Cable
To outlet
PC
Power Cable

2. BASCOM51 Installation Instructions

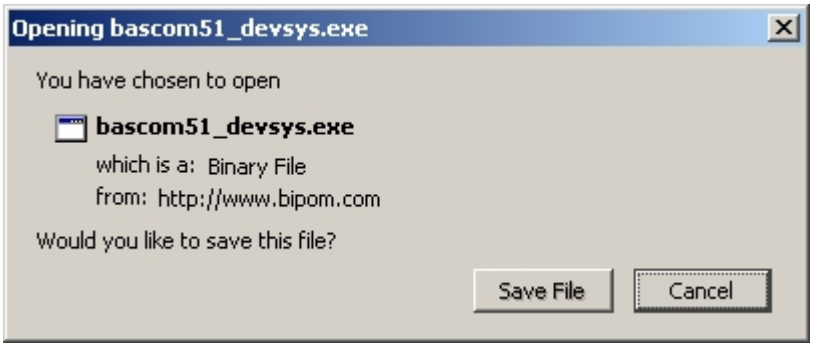
2.1 Micro-IDE Installation

Download BASCOM51 from:

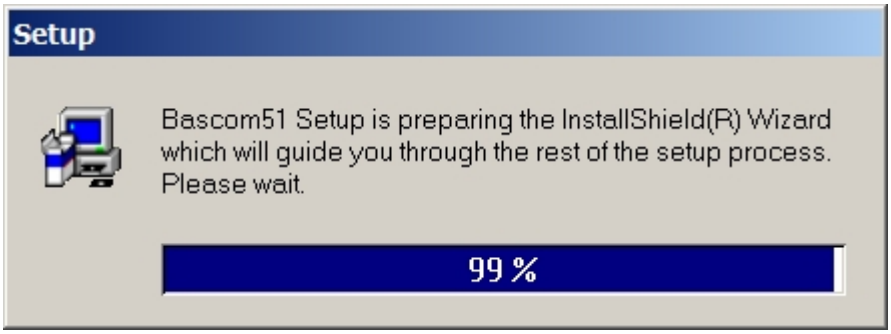
http://www.bipom.com/bascom51_down.php

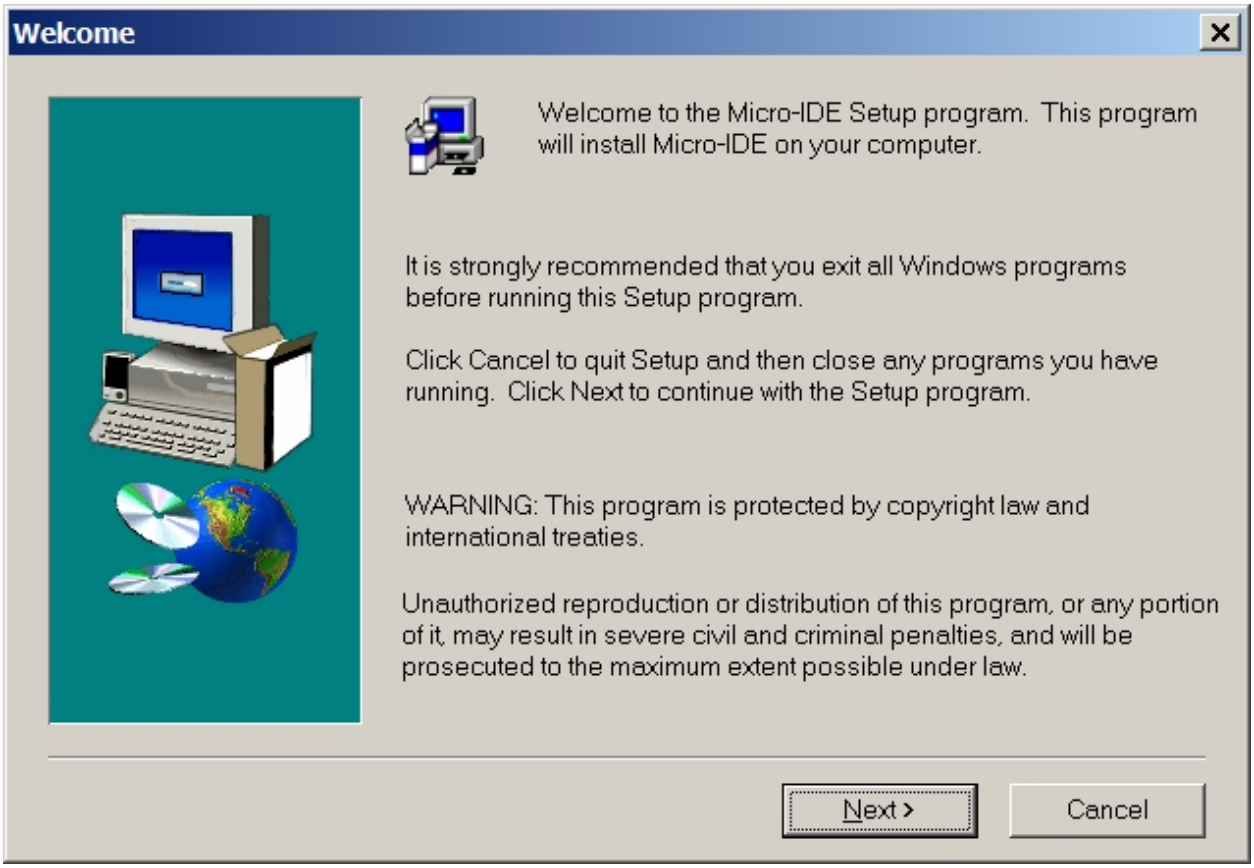


Click on **bascom51_devsys.exe** link. Select **Save File**. Downloading will start.

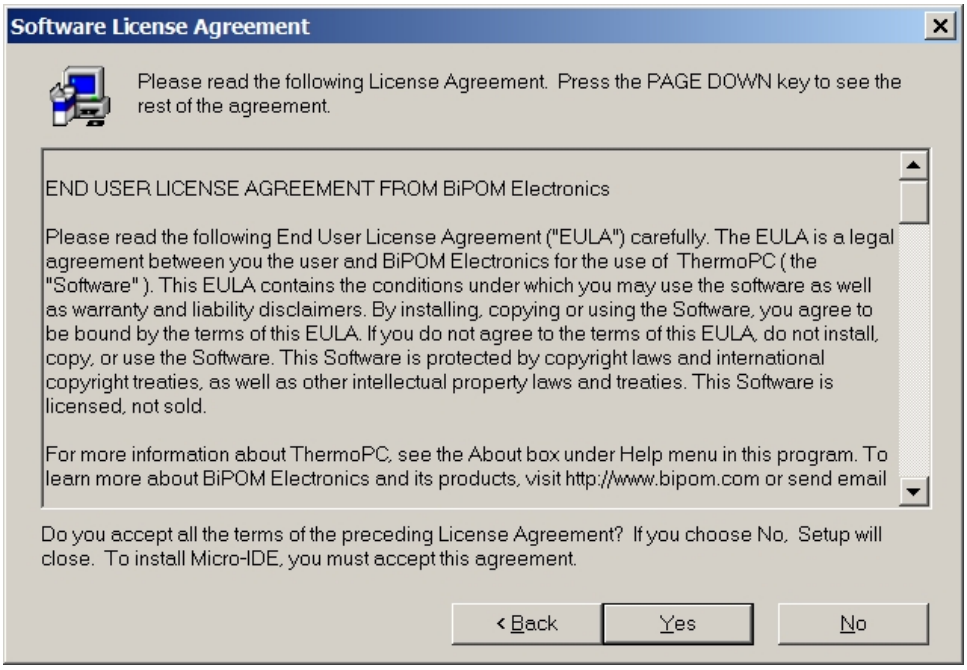


When the download completes, double click on the file **bascom51_devsys.exe** to start installation:

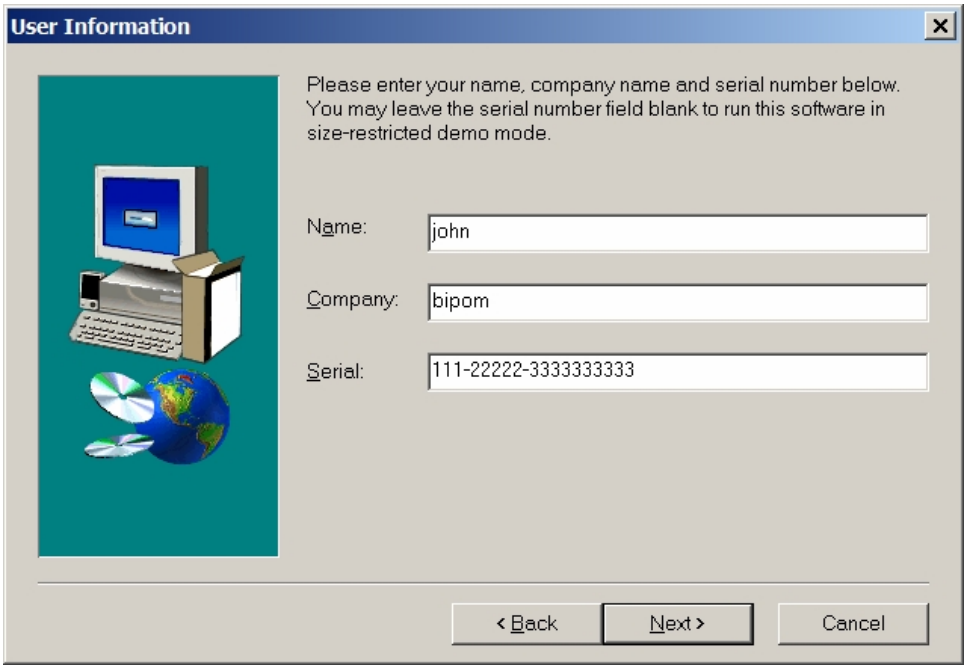




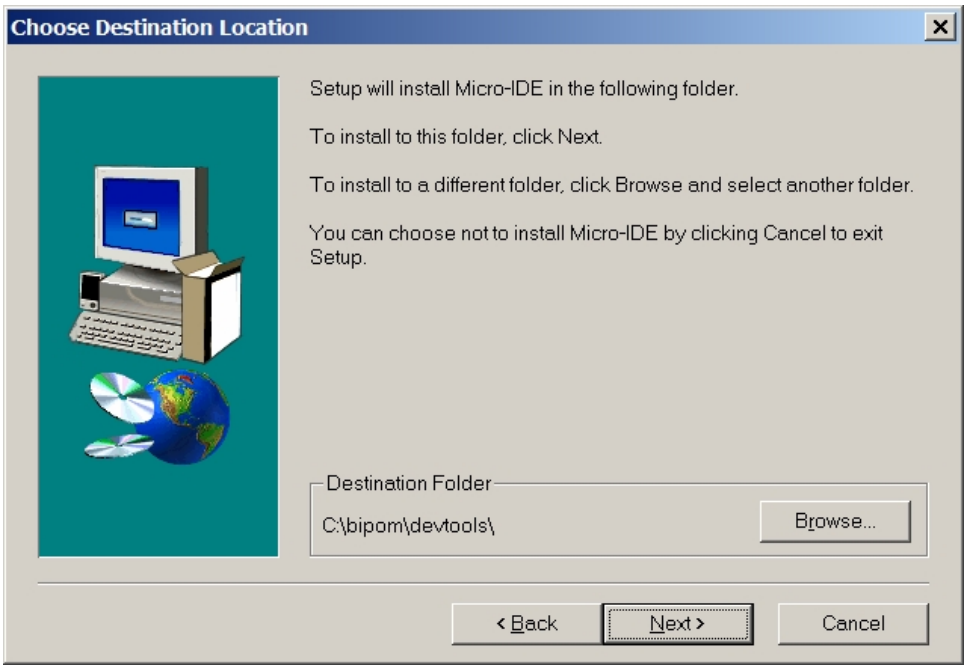
Click **Next**.



Agree to the license agreement by clicking **Yes**.



If you have a serial number from BiPOM, enter your serial number in the Serial field. If it says DEMO in this field, delete DEMO and enter your serial number.

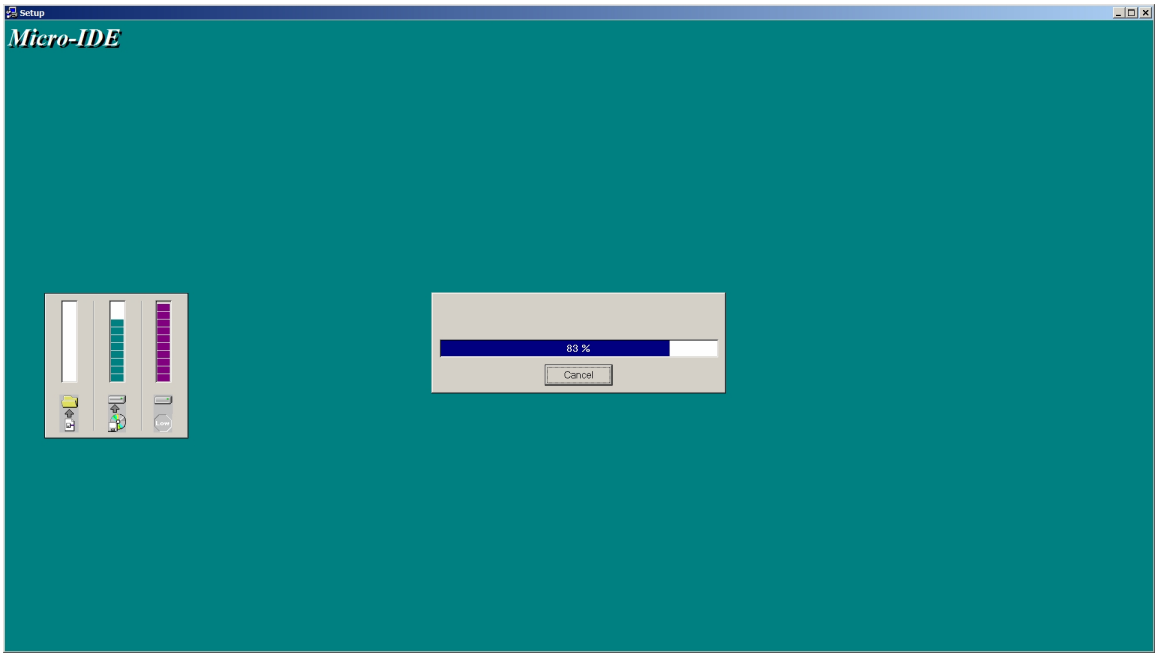


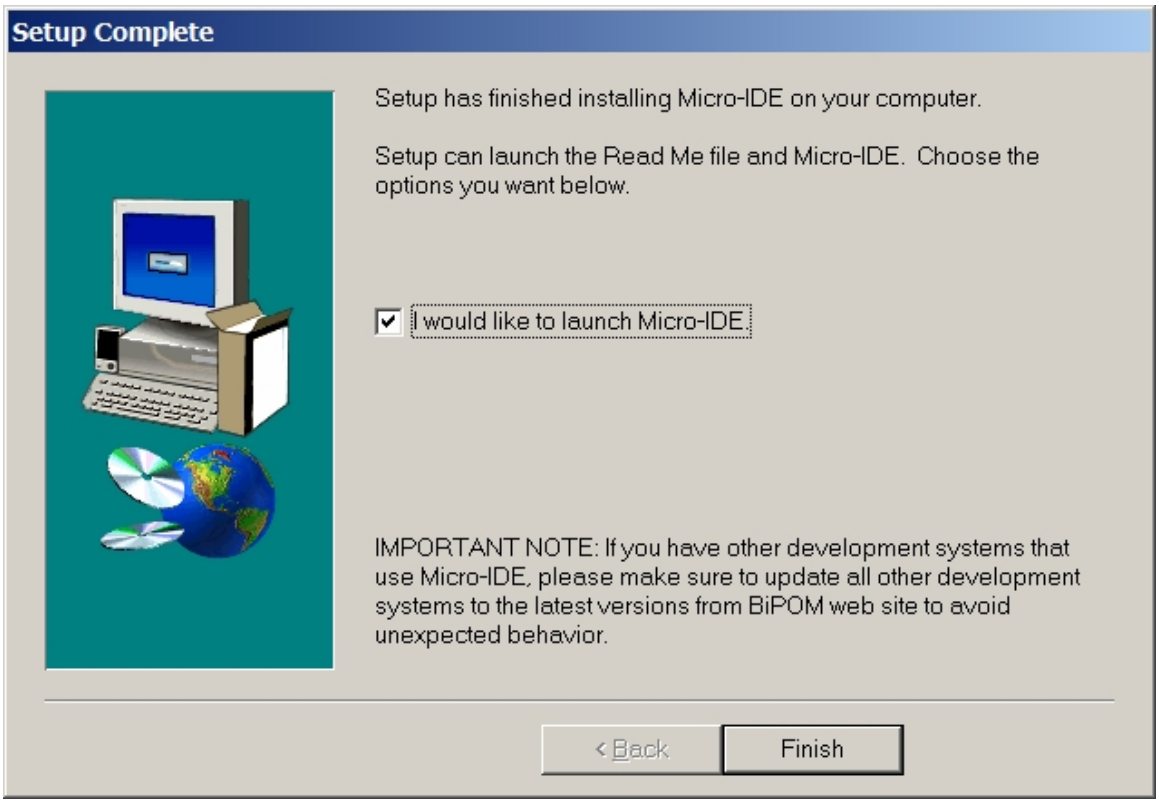
Install to default location: **c:\bipom\devtools**

Click **Next**.

Use default Program Folder **Micro-IDE**. Click **Next**.

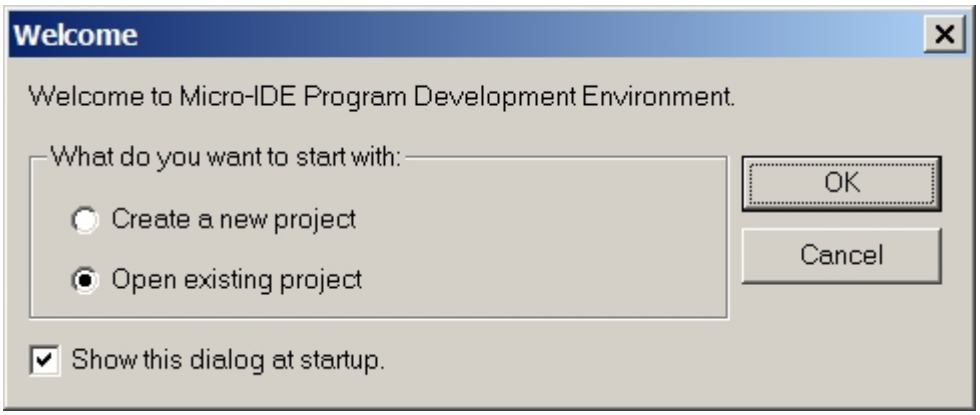
Installation will start.





Click **Finish**. This will start **Micro-IDE**.

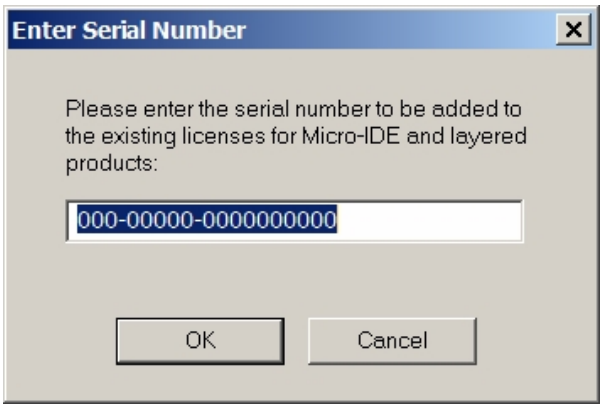
When Micro-IDE starts, you will be asked to open or create a project:



Click **Cancel**.

2.2 Registering Layered Products

If you have additional serial numbers to specify (for example, for layered products such as 8051 Simulator and 8051 Debugger), you can enter these one by one using **Help->Add Serial Number:**



Type your serial on the field shown with 0's; there is no need to type dashes. Click **OK** when finished.

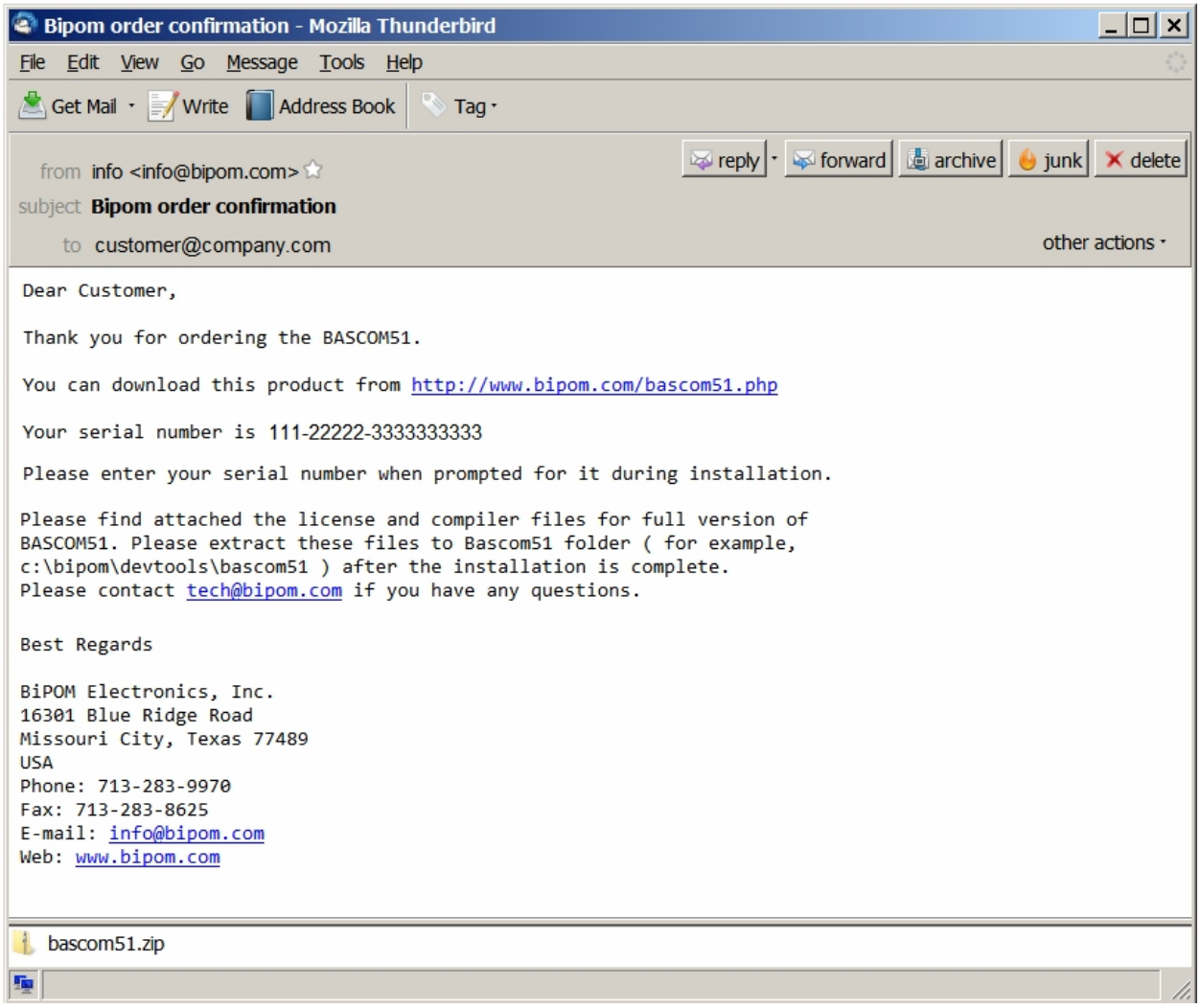
Do this for each additional serial number that you have.

Exit **Micro-IDE** using **File->Exit** or by closing the **Micro-IDE** window.

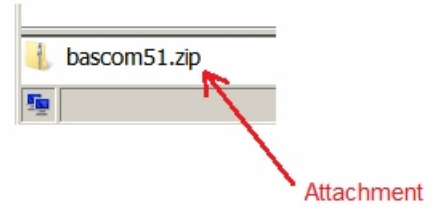
2.3 Activating BASCOM51 Compiler License

Copy BASCOM51 license files to activate the BASCOM51 license. This step is important because BASCOM51 will run in demo mode if it does not detect the two license files that it needs.

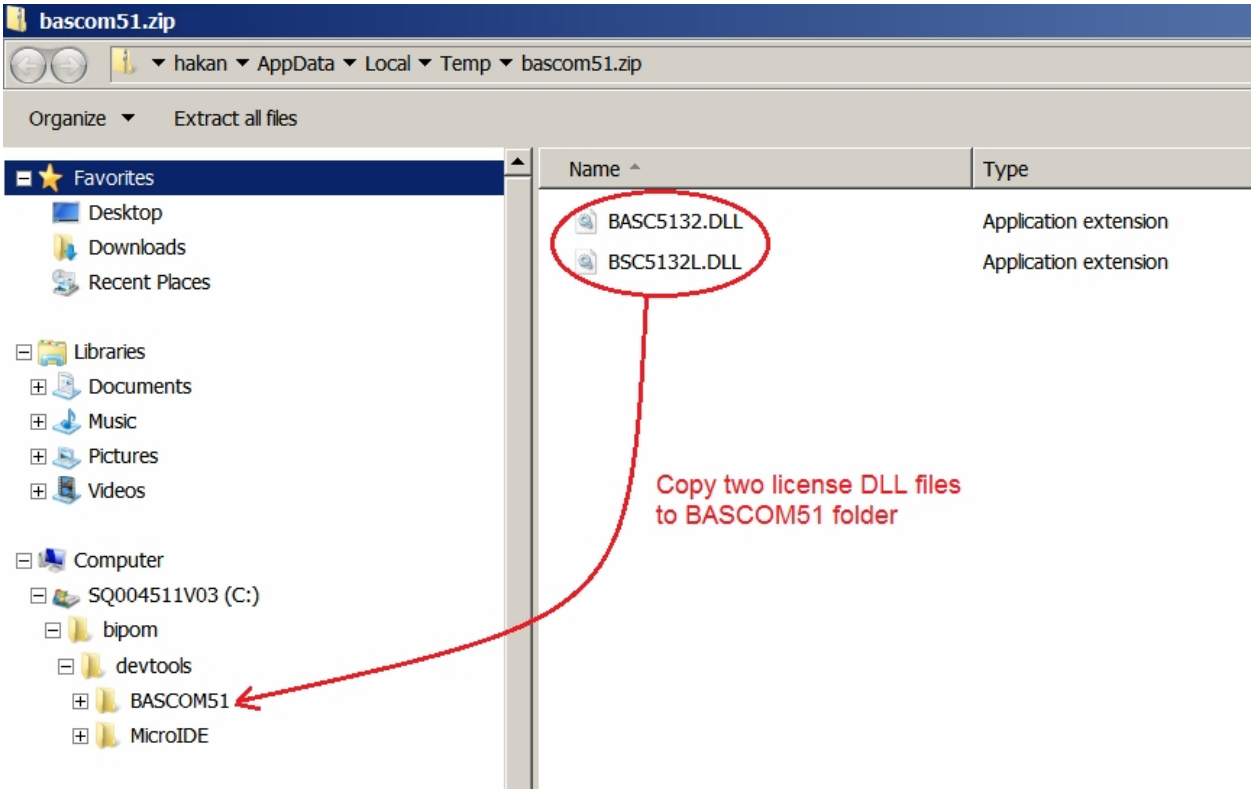
To do this, open the original order email that was sent to you from info@bipom.com:



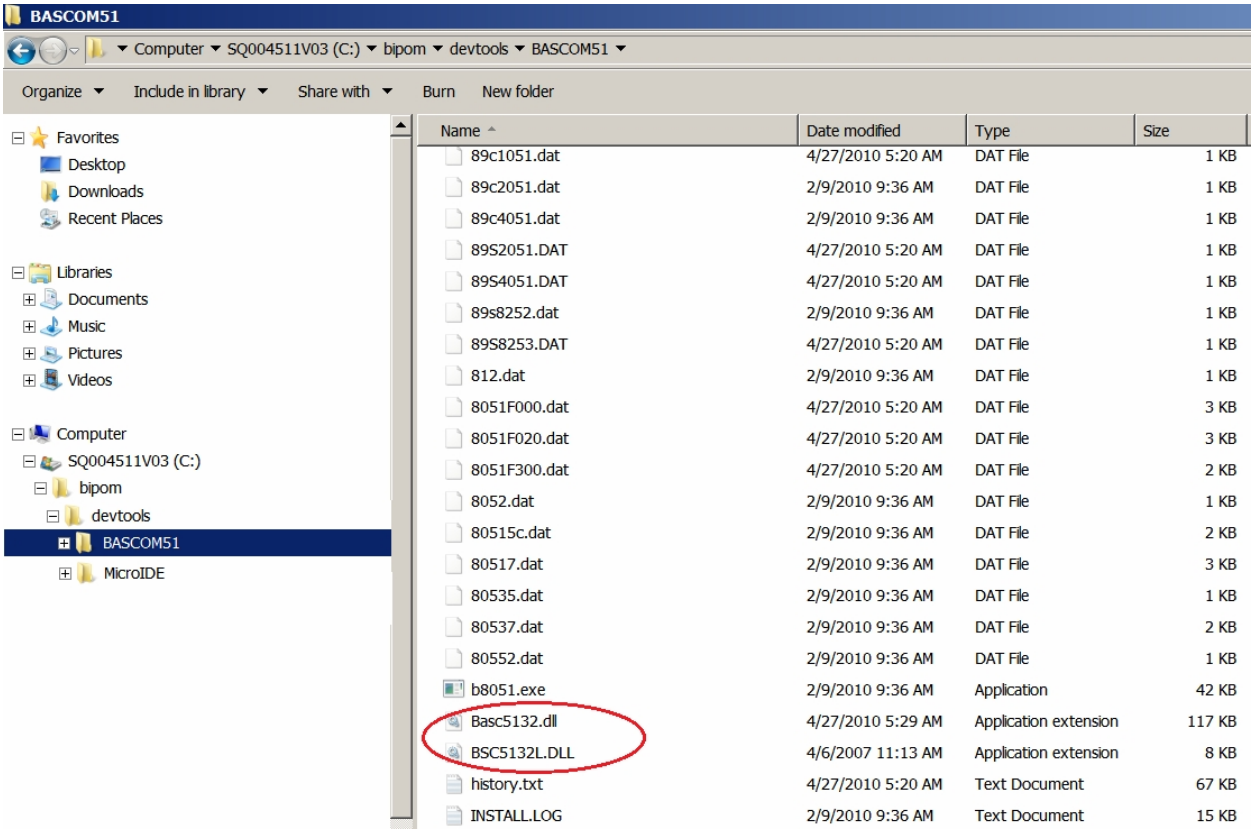
Open the zip attachment (bascom51.zip):



Copy the 2 license DLL files from bascom51.zip to BASCOM51 folder as shown below:

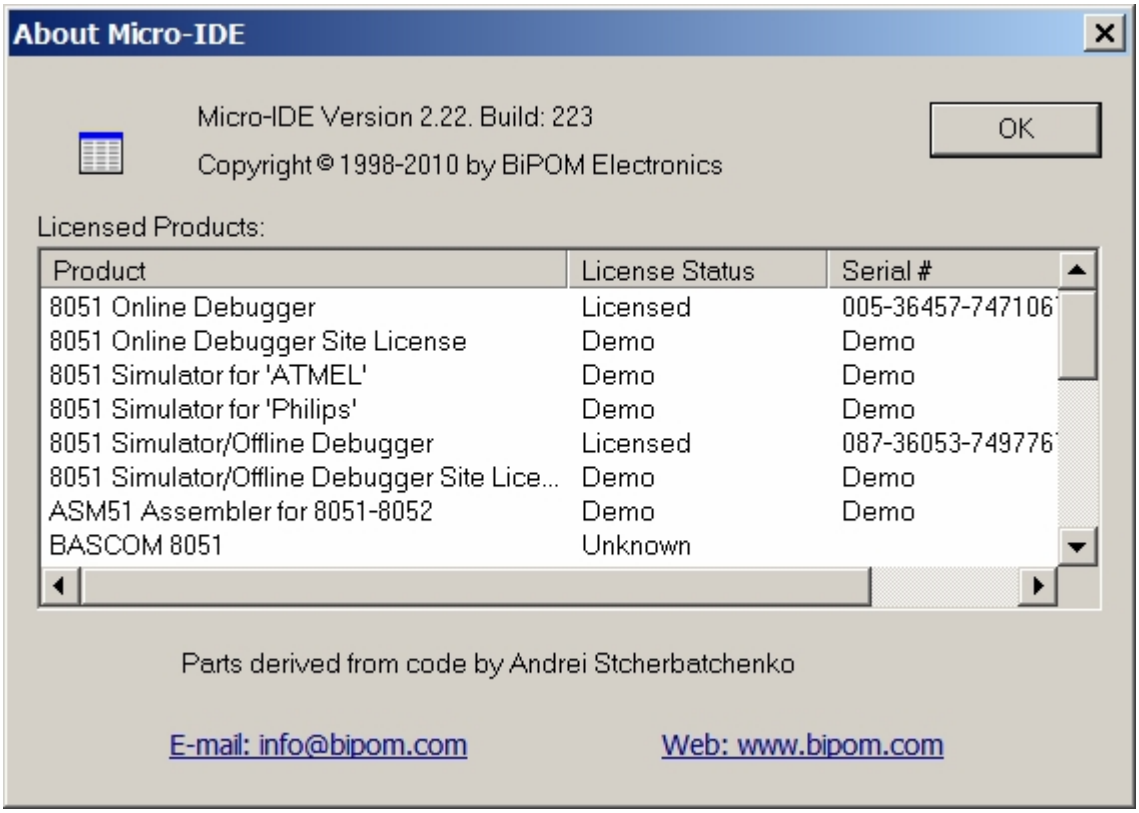


Check to see if the license files BASC5132.DLL and BSC5132L.DLL are in the BASCOM51 folder:



Your BASCOM51 license should not be activated. Start **Micro-IDE** and use BASCOM51 without any restrictions.

You can check the status of licenses using **Help->About in Micro-IDE**:



IMPORTANT: BASCOM51 status is Unknown because Micro-IDE does not keep track of license status of layered compilers. This is OK and it means that BASCOM51 may or may not have a license.

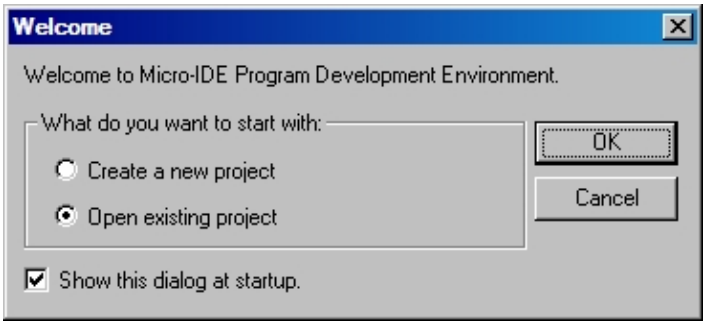
3. Downloading an Example Program

3.1 Opening the Example Project

To open and run an existing BASIC program example, please follows these instructions:

Start **Micro-IDE** from **Start → Programs → Micro-IDE**.

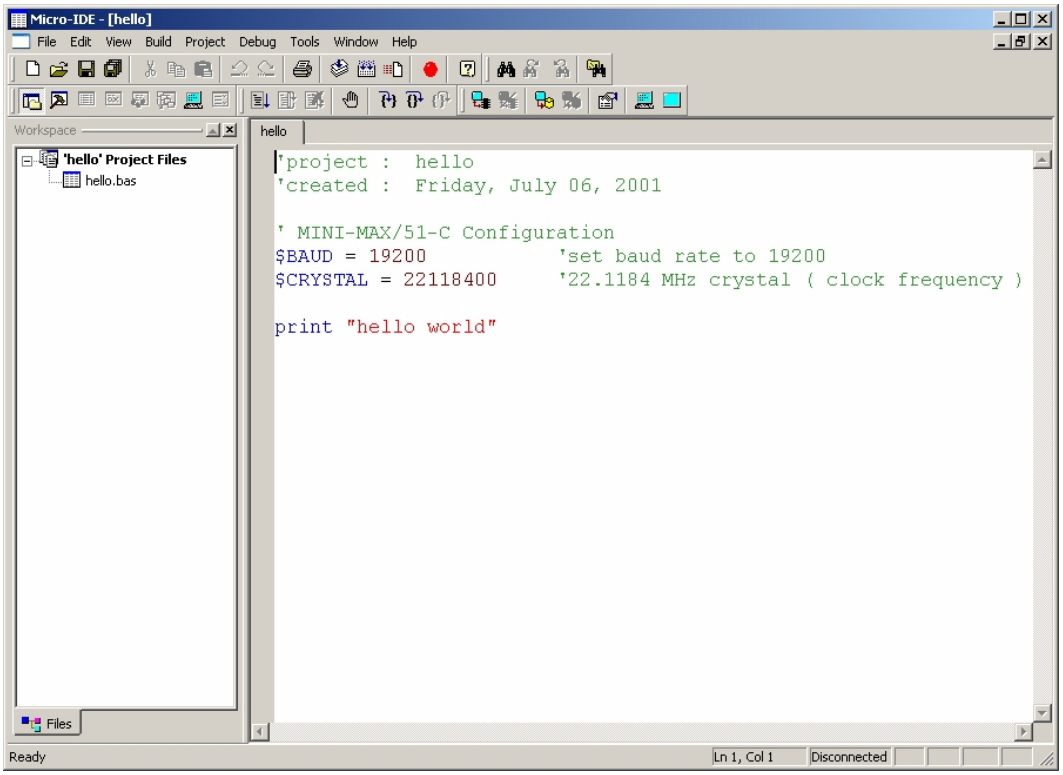
When Micro-IDE starts, the Project Selection window appears:



Click **Open existing project** and then **OK.**

BASCOM51 Development System is distributed with several examples. Example projects are located under the **Examples** folder under ***C:\bipom\devtools\Bascom51\Examples\.***

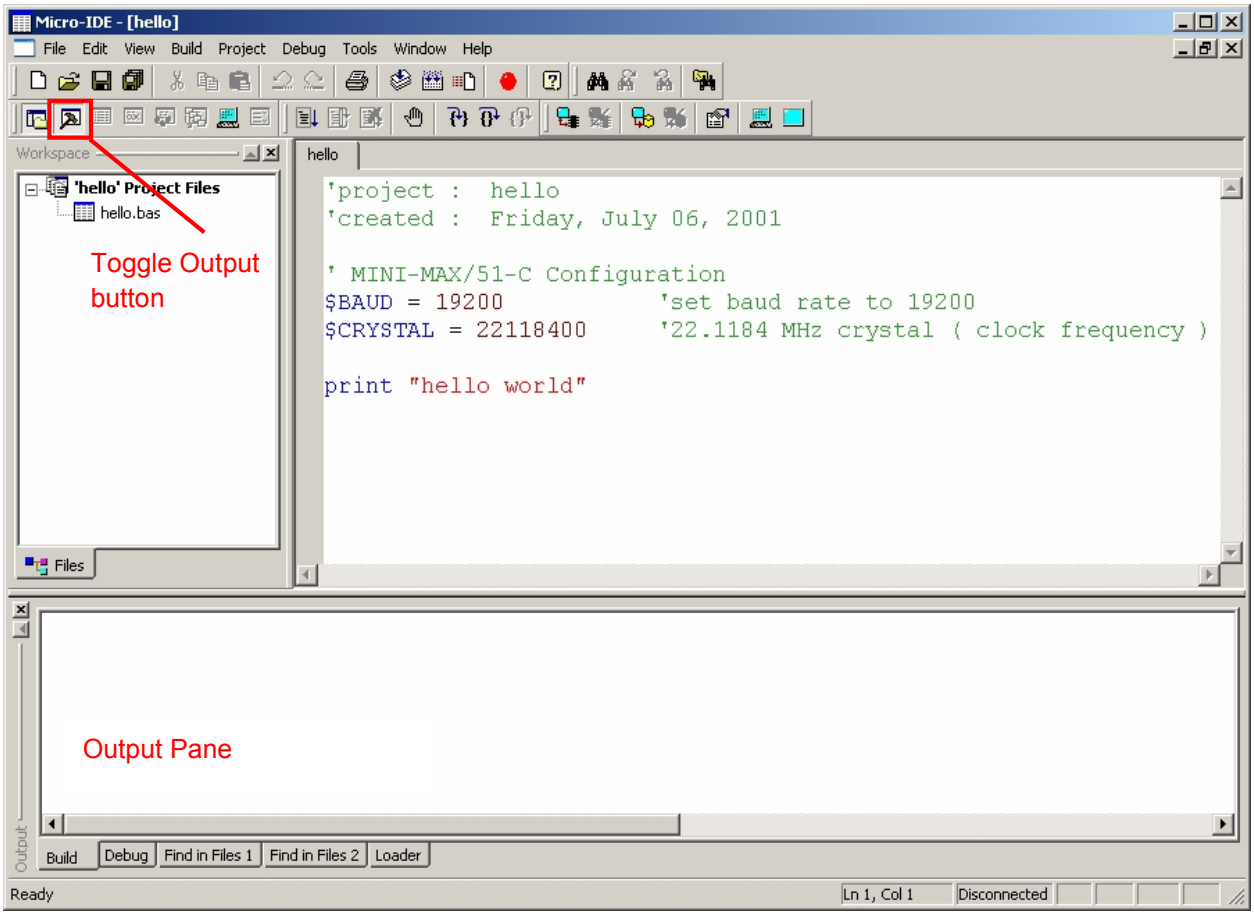
Open the project file ***C:\bipom\devtools\Bascom51\Examples\hello\hello.prj*** . When the project opens, you will see the source of the '**hello**' program.



3.2 Building the Project

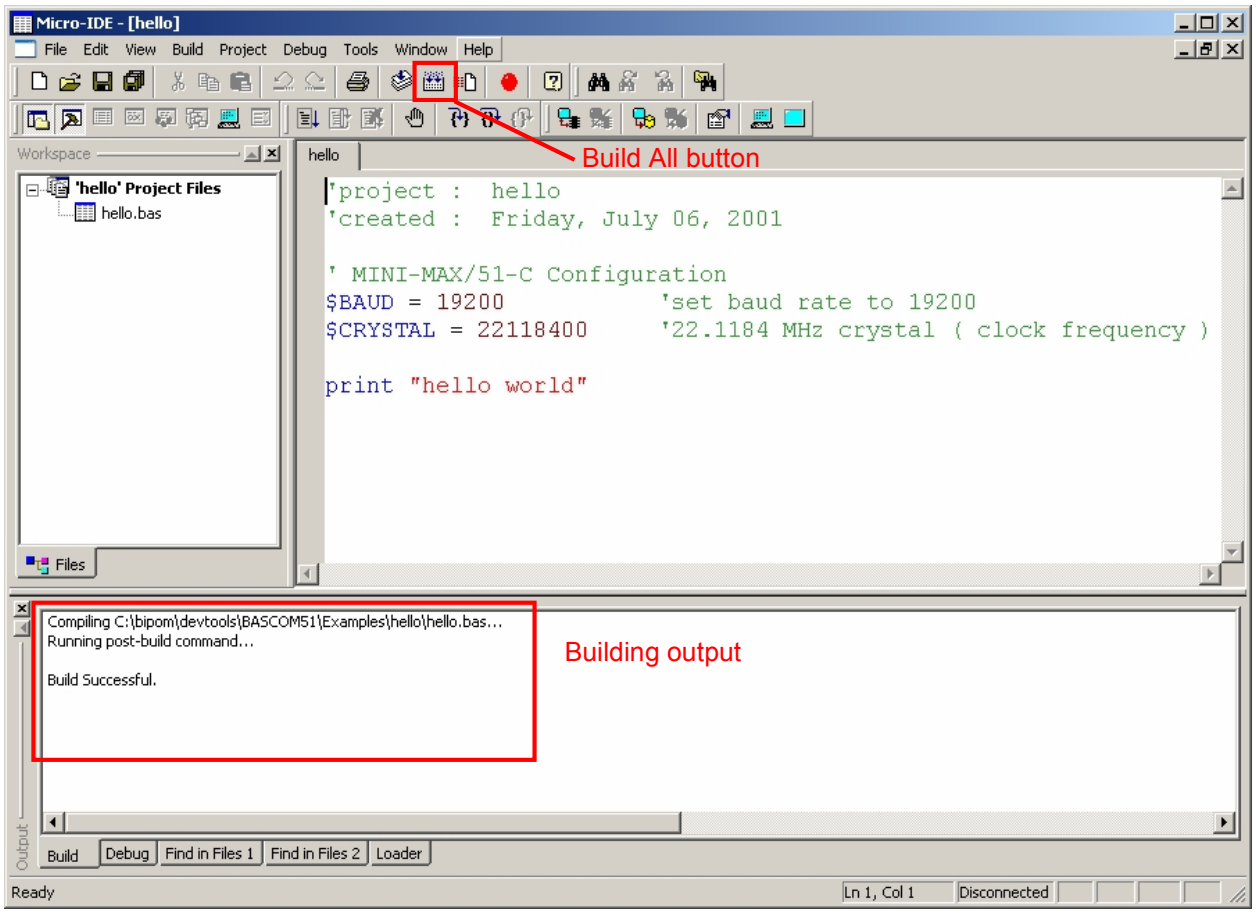
Click **Toggle Output** icon button. This will display the **Output** pane.

NOTE: If the **Output** pane was already open from before, do not click Toggle Output button as this will hide the **Output** pane.



Press the **Build All** icon button. This will generate the output file ***hello.hex*** under following folder:

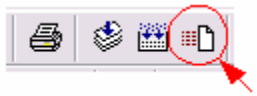
C:\bipom\devtools\Bascom51\Examples\hello

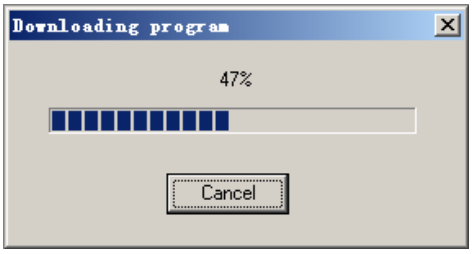


The output messages above indicate that the program compiled successfully. If there are errors in the program, you will see the corresponding error messages in the Output Pane.

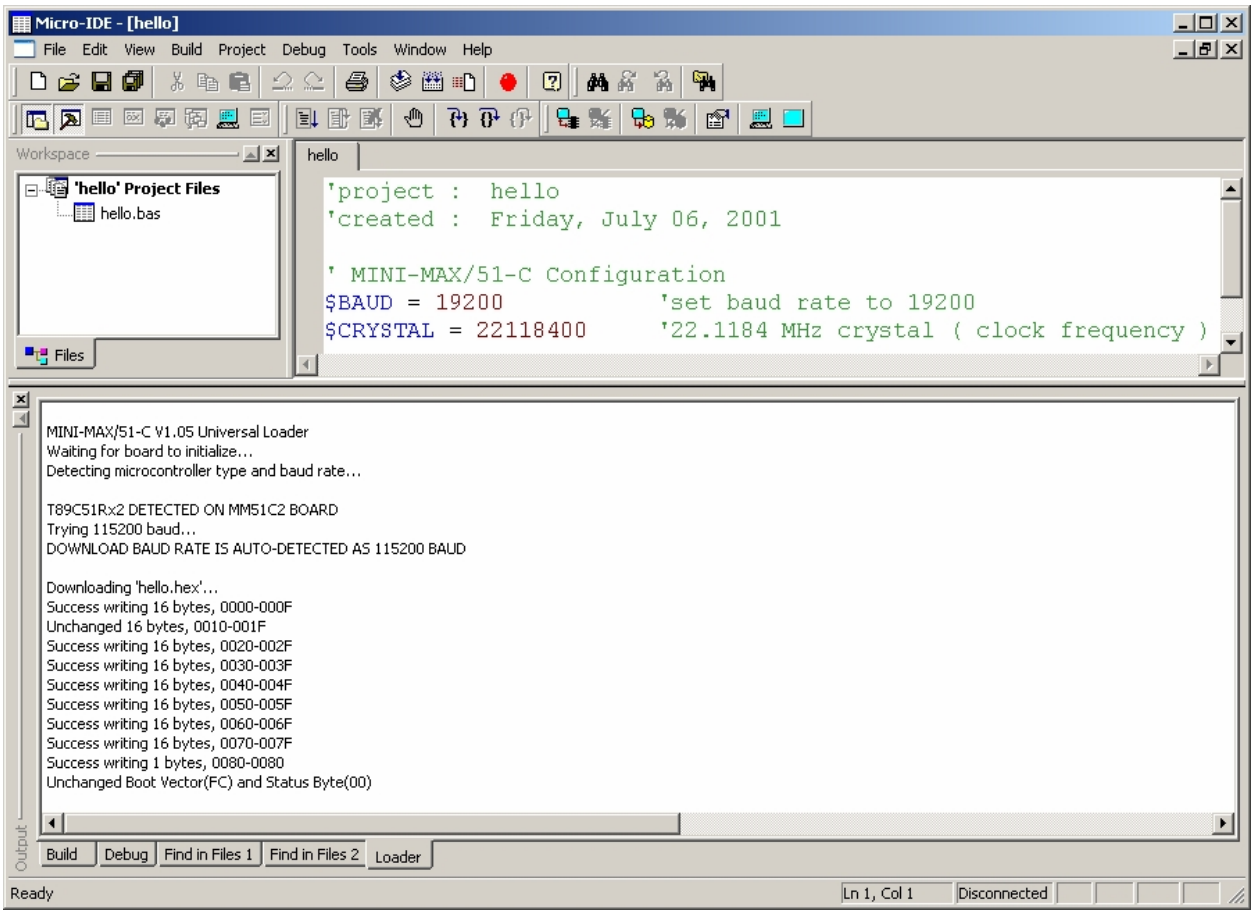
3.3 Downloading the Program

To download the output **hello.hex** file to the target board, press the **Download** icon button on the toolbar. If the board is powered and connected properly to the PC, a progress dialog will appear:





The progress dialog will disappear after a successful download. Details of the download are shown on the **Output** pane:

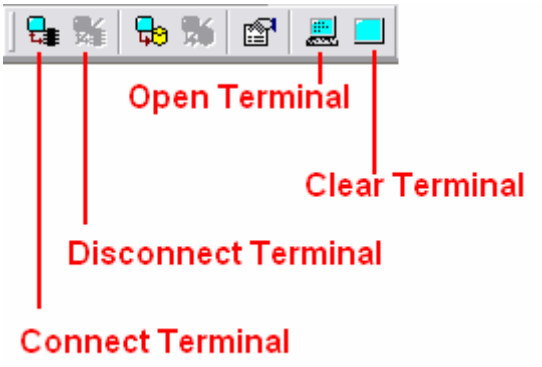


3.4 Running the Program

When the download completes, the progress indicator disappears. This means that the board has received the program successfully. After the program has been successfully downloaded, the program can be started using the Mode button on the main Toolbar:

Mode button puts the board either into **Run** or **Program** mode. In Run mode, the microcontroller is executing the program in its memory. In Program mode, the microcontroller is in Reset state so no programs are running. In Program mode, microcontroller's flash memory can be changed and a new program can be downloaded.

Before running the program, open the Terminal window first to see the output of the example program. Following are the buttons on **Terminal Toolbar**:



Connect Terminal - When you click this button, the terminal opens and connects to the selected COM port. When the target board sends data to its serial port, the messages will appear in Terminal window.

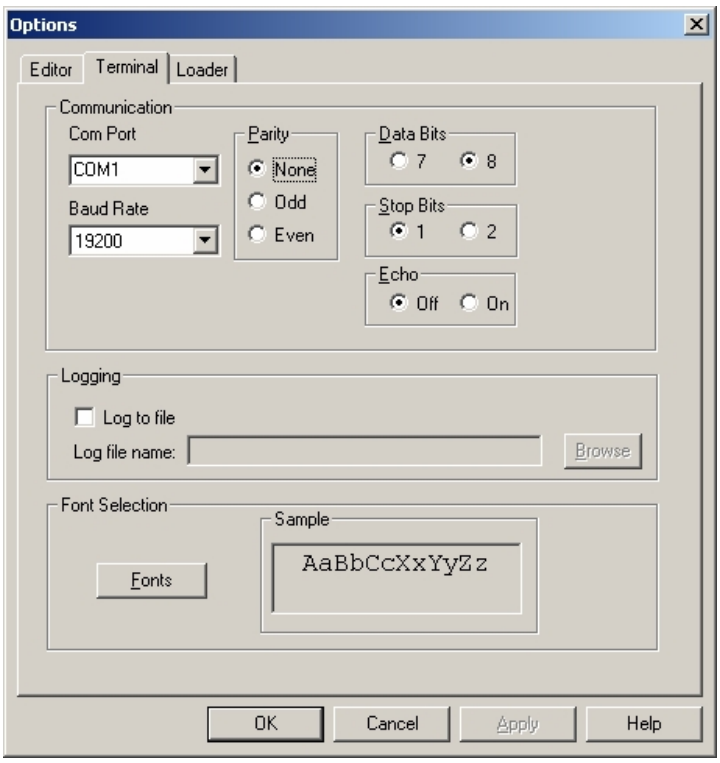
Any characters typed in the Terminal window will be sent to the board through the COM port to which Terminal is connected.

Disconnect Terminal - Disconnects from and closes the COM port.

Open Terminal – Displays or hides the Terminal.

Clear Terminal – Erases the contents of the Terminal window.

To specify the options for Terminal, select **Tools → Options** in main menu to open the **Options** dialog. Select **Terminal** tab:



Select the correct PC COM port that you have connected the board. Other settings should be set as below:

Baudrate: 19200

Parity: None

Data Bits: 8

Stop bits: 1

Echo: On – Micro IDE echoes to (prints) in terminal window what the user types; Off - Micro IDE does not print in terminal window what the user types.

Click the OK button to save the settings and close the **Options** dialog.

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 that was downloaded last starts executing.

You should now see the message “hello world” being displayed on the Terminal window.

Congratulations!!! You have built and executed your first program on the BASCOM51.

For more help, please read **Help for Micro-IDE (BASCOM-51)** under **Help** menu of **Micro-IDE**.

A full set of BASCOM commands is under **BASIC Language Reference** under Help menu of **Micro-IDE**.

3.5 What to do if download fails ?

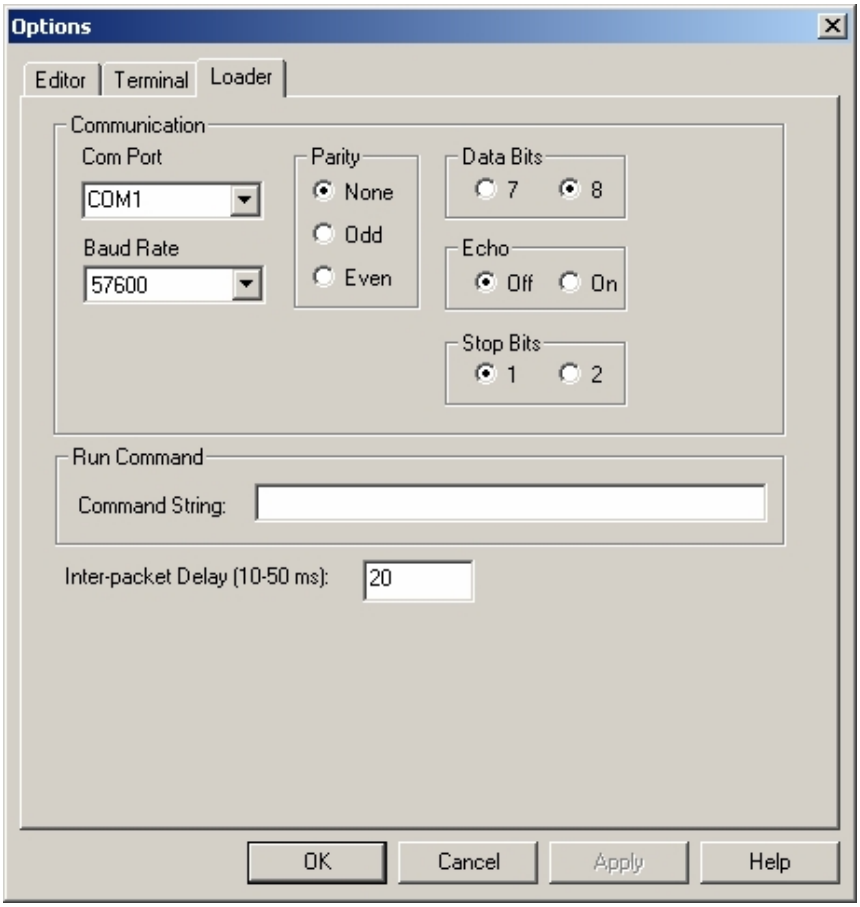
The MINI-MAX/51-C Downloader has been available for several years now and is a highly reliable downloader.

You should only pay attention to few details to make sure that the download works:

- Make sure that the board is powered.

- Make sure that you are using the NULL modem cross cable (Laplink cable) that came with the board. Other NULL modem cables may not work. Straight through cables will NOT work.

- Make sure that you are using the correct serial (COM) port. Some PC's have more than one serial port. Check **Tools->Options->Loader** in **Micro-IDE** for the correct COM port. Baud rate, parity, data bits, stop bits, etc. do not make a difference for the MINI-MAX/51-C Loader. All these are automatically detected by the loader. Similarly, the microcontroller type on the board is detected automatically.

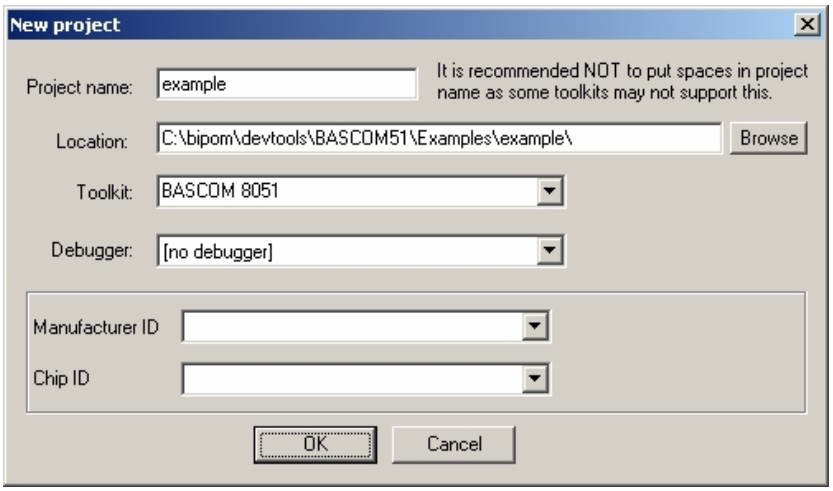


- Make sure that you use the latest software from our website. Older versions of the software may not support newer processors such as the AT89C51ED2. Both the 8051 Development System and BASCOM51 include the latest MINI-MAX/51-C Loader.

4. Creating Your Own BASIC Program

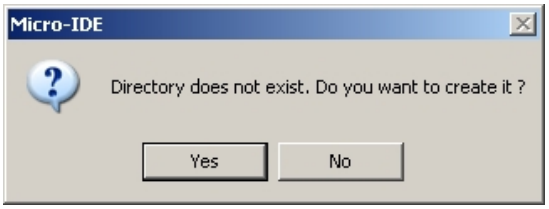
4.1 Creating a New Project

To create your own project, select **Project** menu and select **New Project**. This will display the **New Project** dialog.

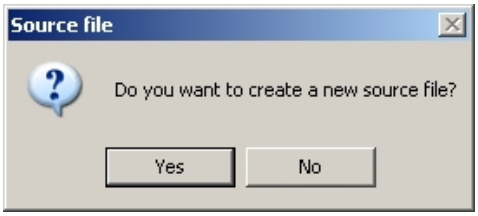


Enter the name of the new project and its location (this example uses ***example*** as the project name and ***C:\bipom\devtools\BASCOM51\Examples\example*** as the project location). Select **BASCOM 8051** as the Toolkit.

Click **OK.** You will be prompted to create directory for the project. Click **Yes**.



After this you will be prompted to create new source file. Also click **Yes**.

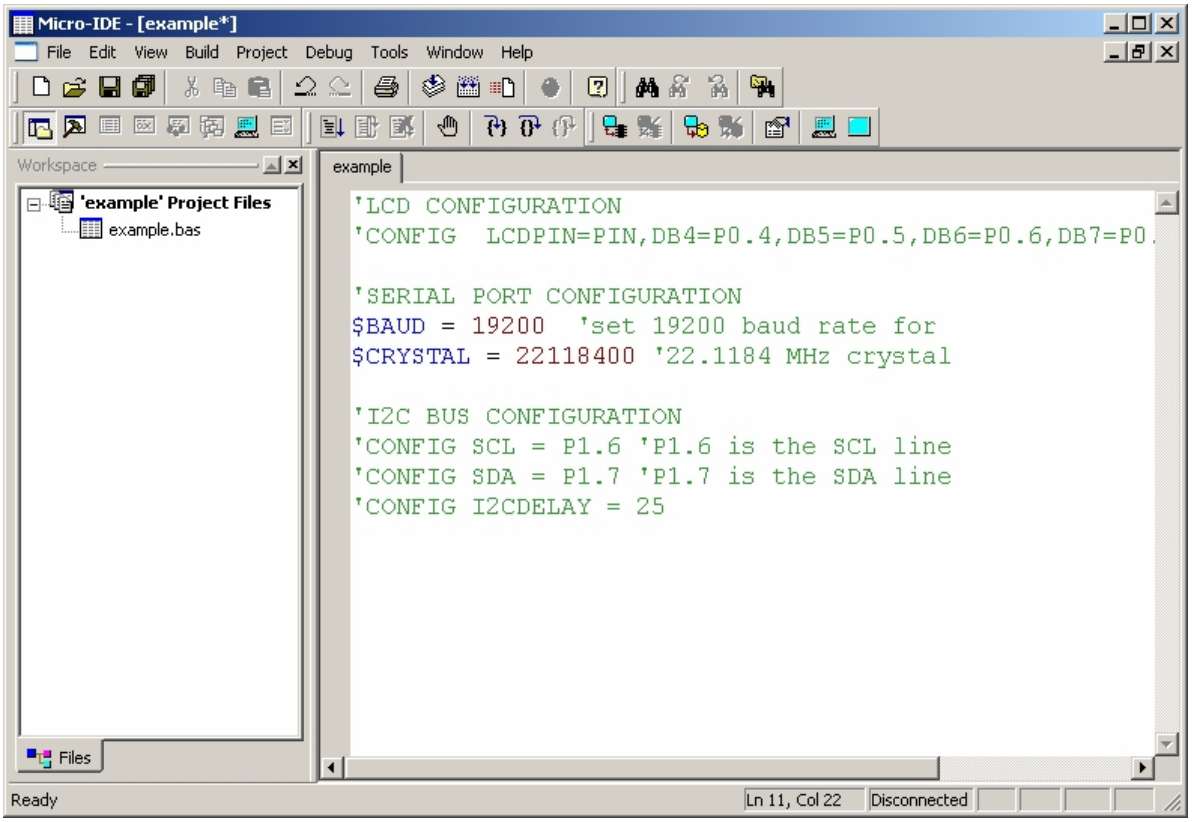


The new project with the name of **example** will be created under:

C:\bipom\devtools\BASCOM51\Examples\example

The project will now have an **example.bas** program file that was automatically created by Micro-IDE. This is a blank template file of a BASCOM51 BASIC program. Comments contain configuration commands for LCD, I2C and Serial port. In this example we will use only Serial port so uncomment the lines that have Serial port configuration.

The resulting code is shown below:



4.2 Adding program lines

Now add aliases for ports on the MINI-MAX/51-C2 board. These will be used to control LED's on TB-1 Peripheral Board if this board is connected. Otherwise program will simply change the logic levels on the port pins.

NOTE: More information about TB-1 Peripheral board is available on BiPOM web site:

TB-1 Peripheral Board - http://www.bipom.com/products/us/213.html

MINI-MAX/51-C2 Board - http://www.bipom.com/products/us/318646.html

Add the following lines of code below all text in examples.bas:

```
RED         Alias P1.3        'define port pin of Red LED
YELLOW      Alias P1.1        'define port pin of Yellow LED
GREEN       Alias P1.0        'define port pin of Green LED
```

These lines of BASIC code creates aliases for three pins on PORT 1. This way, we can use RED instead of P1.3 to make the program more readable.

Below this, add code to print a greeting message as soon the program is started. Program will print message to the Serial port.

```
Print
Print "Checking LEDs..."
```

As soon the program starts running, `Checking LEDs...` message will be displayed in Micro-IDE Terminal window.

The following code adds an infinite loop that turns on/off all three LED's on TB-1 board one by one with a one second delay in between:

```
Do
      Print       "RED"
      Reset       RED
      WaitMs      1000
      Set         RED

      Print       "YELLOW"
      Reset       YELLOW
      WaitMs      1000
      Set         YELLOW

      Print       "GREEN"
      Reset       GREEN
      WaitMs      1000
      Set         GREEN
Loop
```

`Do Loop` - This statement makes a forever loop
`Print` - Sends specified string to Serial port
`Reset` - Resets a bit of a microcontroller output port
`Set` - Sets a bit of a microcontroller output port
`WaitMs` - Suspends program execution for a given time in milliseconds

The `End` statement at the very end of program code tells BASCOM51 Compiler that this is the end of program.

NOTE: More information about BASCOM 8051 Language is on BiPOM web site:

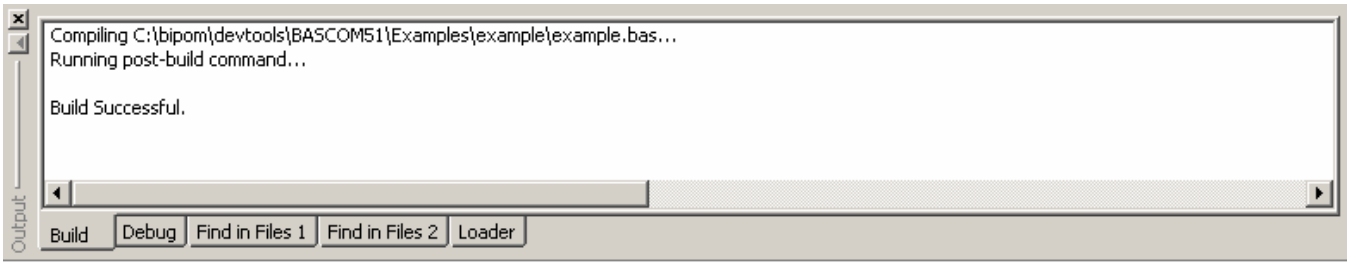
http://www.bipom.com/bashelp/bascom51.htm

After all these changes, the program should look like the following:

```
'LCD CONFIGURATION
'CONFIG  LCDPIN=PIN,DB4=P0.4,DB5=P0.5,DB6=P0.6,DB7=P0.7,E=P0.2,RS=P0.0

'SERIAL PORT CONFIGURATION
$BAUD = 19200  'set 19200 baud rate for
$CRYSTAL = 22118400 '22.1184 MHz crystal

'I2C BUS CONFIGURATION
'CONFIG SCL = P1.6 'P1.6 is the SCL line
'CONFIG SDA = P1.7 'P1.7 is the SDA line
'CONFIG I2CDELAY = 25

RED         Alias P1.3        'define port pin of Red LED
YELLOW      Alias P1.1        'define port pin of Yellow LED
GREEN       Alias P1.0        'define port pin of Green LED

Print
Print "Checking LEDs..."

Do
      Print       "RED"
      Reset       RED
      WaitMs      1000
      Set         RED

      Print       "YELLOW"
      Reset       YELLOW
      WaitMs      1000
      Set         YELLOW

      Print       "GREEN"
      Reset       GREEN
      WaitMs      1000
      Set         GREEN
Loop
End
```

4.3 Building and Running a Program

Press **Build All** icon button. This will generate the output file **example.hex** in project folder.
If program is built successfully, the following messages will be displayed in **Output** pane:



Download the program to the board by clicking the **Download** button on the main toolbar. If the board is powered and connected properly to the PC COM port, a progress dialog will appear.

When download completes, run the program by clicking the **Mode** button on the main toolbar. The Mode button should be green now. You will see that the LED's on TB-1 turn on and off if TB-1 board is connected.

Congratulations!!! You have built and executed your first BASCOM 8051 program on the MINI-MAX/51-C2.