# **Using MOTOR-2 Library with AVR Studio**

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16301 Blue Ridge Road, Missouri City, Texas 77489 Telephone: 1-713-283-9970 Fax: 1-281-416-2806 E-mail: <u>info@bipom.com</u> Web: <u>www.bipom.com</u> © 1996-2010 by BiPOM Electronics. All rights reserved.

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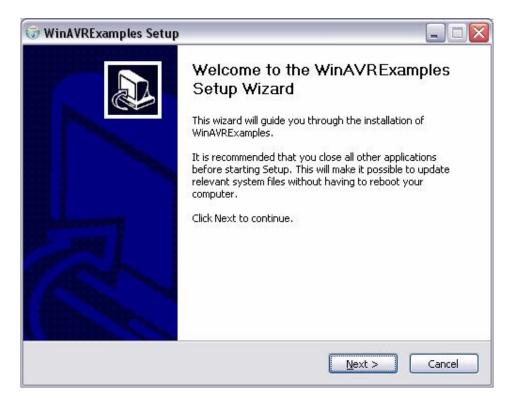
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# 1. Setup Software

1.1 Download MOTOR-2 WinAVR Example installation file from BiPOM web:

http://www.bipom.com/web\_softwares/3088362.html

1.2 Run downloaded file **motor2\_winavr\_examples.exe** to start installation.



1.3 Click Next

all Location folder in which to Examples will be		Examples,		
Examples will be	· · · · · · ·			
to build examples		ctly folder because	in other w	vay AVR Studio will
n Folder				
n\devtools\WinA\	VRExamples			Browse
J.	n Folder m\devtools\WinA' red: 42.0KB	m\devtools\WinAVRExamples	m\devtools\WinAVRExamples	m\devtools\WinAVRExamples

### 1.4 Click Next

WinAVRExamples Setup		
Choose Start Menu Folder Choose a Start Menu folder for th	e WinAVRExamples shortcuts.	
Select the Start Menu folder in wh can also enter a name to create a	ich you would like to create the program's new folder.	shortcuts. You
WinAVRExamples		
Accessories Administrative Tools Adobe Artweaver Atmel AVR Tools AVG Free 9.0 Bitvise Tunnelier DAEMON Tools Lite D-Link Games GIMP		
Do not create shortcuts	< <u>B</u> ack Install	Cancel

#### 1.5 Click Install

🕞 WinAVRExamples Setup		
Installation Complete Setup was completed successfully.		
Completed		
Create shortcut: C:\Documents and Set	WRExamples hgs\Igor Slepchenkov\Start Menu\Programs\W. ttings\Igor Slepchenkov\Start Menu\Programs. ttings\Igor Slepchenkov\Start Menu\Programs.	
WinAVR Examples	< <u>B</u> ack Close Ca	ncel

#### 1.6 Click **Close**. Files will be installed to

c:\bipom\devtools\WinAVRExamples\MOTOR-2\ folder on your PC.

**NOTE:** Examples required MOTOR-2 library. AVR Studio projects have save path to the library file. So if you try to build examples from another folder then c:\bipom\devtools\WinAVRExamples\MOTOR-2 you will get error.

If you want to move files to another folder then you have to change path to library files in Project Settings in AVR Studio.

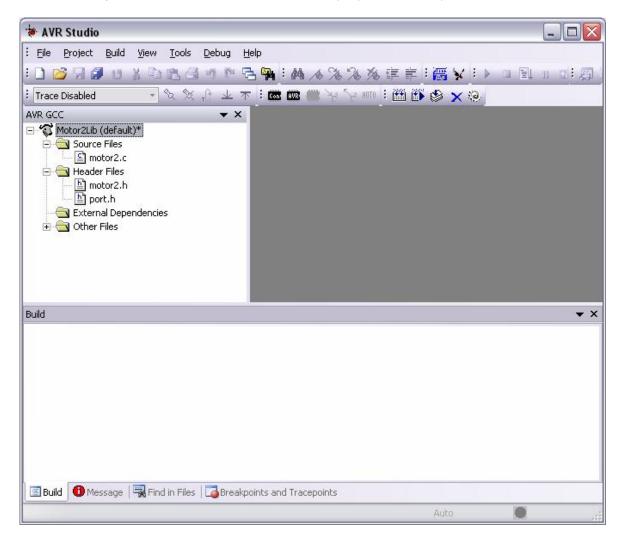
## 2. Build MOTOR-2 Library

If you want to rebuild MOTOR-2 Library you should do following steps.

2.1 Open MOTOR-2 Library project in AVR Studio. You can simple double click on

#### c:\bipom\devtools\WinAVRExamples\MOTOR-2\Lib\Motor2Lib.aps

and if you have installed AVR Studio the project will be opened in it.



2.2 Go to menu **Build** à **Build** (or press F7 key on keyboard). Library will be build and **libmotor2.a** should be created/updated.

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2.3 On the **Messages** window you can see following error messages:

```
Loaded plugin STK500
Loaded plugin AVR GCC
Loaded partfile: C:\Program Files\Atmel\AVR
Tools\PartDescriptionFiles\
gcc plug-in: Error: Object file not found on expected location
c:\bipom\devtools\WinAVRExamples\MOTOR-2\Lib\Motor2Lib.elf
Make sure your makefile specifies the output .elf file as
Motor2Lib.elf
```

Don't care about them. Library project doesn't create ELF file so it cannot be detected by AVR Studio.

### 3. How to create new MOTOR-2 Example using MOTOR-2 Library

Let's create new MOTOR-2 Example which will only initialize MOTOR-2 board.

- 3.1 Start AVR Studio
- 3.2 Click **Project** à New Project
- 3.3 In opened window enter following values:

Project Type	: AVR GCC
Project Name	: Motor2Init
Initial File	: Motor2Init
Location	: C:\bipom\devtools\WinAVRExamples\MOTOR-2\

Also check **Create initial file** and **Create folder** checkboxes. Click **Next>>** button.

3.3 On next screen select **Debug Platform** and **Device**.

Debug Platform	: AVR Simulator
Device	: ATmega168

3.4 Click **Finish** button. New project will be created and initial file will be opened.

#### 3.5 Go to **Project** à **Configuration Options**

3.6 On **General** tab check that options will be like on the picture

lotor2Init Proje	ect Options
30	Active Configuration default
General	🔲 Use External Makefile
\$ a	<ol> <li>Target name must equal project name.</li> <li>Clean/rebuild support requires "clean" target.</li> <li>Makefile and target must exist in the same folder.</li> </ol>
Include Directories	Output File Name: Motor2Init.elf
	Output File Directory: default
Libraries	Device: atmega168 🔽 Unsigned Chars (-funsigned-char)
	Frequency: 4000000 hz Vunsigned Bitfields (-funsigned-bitfields)
emory Settings	Optimization: -Os Short Enums (-fshort-enums)
2	I Create Hex File I Generate Map File I Generate List File
ustom Optior 🔽 💡	OK Cancel Help

3.7 Then click on **Libraries** button. You should add **libmotor2.a** library file to your project.

3.8 On Libraries tab click Add Object... button and select libmotor2.a in c:\bipom\devtools\WinAVRExamples\MOTOR-2\Lib\ folder. You will see it inside Link with These Objects list at the right side of window.

Include       Include	Motor2Init Proje	ct Options	
Memory Settings     libscanf_min.a     Add Object	General General Directories Libraries	Library Search Path: Available Link Objects: libc.a libpint_flt.a libprintf_flt.a libprintf_flt.a	Add Library> C:\bipom\devtools\WinAVRExan Remove Object
Move up Move down	2		
Custom Optior	Custom Optior		

3.9 Now you should add c:\bipom\devtools\WinAVRExamples\MOTOR-2\Lib\ folder to Library Search Path list. Click button with yellow folder icon at the top of window and enter the path to new list item. Or use browse button to the right from list item to browse folder where libmotor2.a file is.

Motor2Init Proje	ct Options	
General	Library Search Path:	Click to add new path
Include Directories Libraries Memory Settings	Available Link Objects: libc.a libm.a libobjc.a libprintf_flt.a libprintf_min.a libscanf_flt.a libscanf_min.a	Add Library>       C:\bipom\devtools\WinAVRExam         Remove Object       C:\bipom\devtools\WinAVRExam         Add Object       Move up         Move down       Move down
		OK Cancel Help

Motor2Init Proje	ect Options		
500	Library Search Path:		
General	C:\bipom\devtools\WinAVF	Examples\MOTOR-2\Lib\	
<b>*</b>			
Include Directories	Available Link Objects:	Link wi	th These Objects:
	libc.a libm.a	Add Library> C:\bip	om\devtools\WinAVRExam
Libraries	libobjc.a libprintf_flt.a libprintf_min.a	Remove Object	
Memory Settings	libscanf_flt.a libscanf_min.a libmotor2.a motor2.o	Add Object	
		Move up	
Custom Optior		Move down	
Custom Option	Y	ок (	Cancel Help

3.10 Now you should add c:\bipom\devtools\WinAVRExamples\MOTOR-2\Lib\ folder to Include Directories list. Click Include Directories button at the left side of window. Click button with yellow folder icon at the top of window and enter the path to new list item. Or use browse button to the right from list item to browse Lib folder.

Motor2Init Projec	ct Options 🛛 🛛 🔀
General	C:\bipom\devtools\WinAVRExamples\MOTOR-2\Lib\
Include Directories	
Libraries	
Custom Optior 모 _	OK Cancel Help

3.11 Now click OK button to save changes

3.12 Open Motor2Init.c file in AVR Studio editor and enter following C code:

```
// include MOTOR-2 function declaration file
#include "motor2.h"
int main()
{
    // Initialize MOTOR-2 board
    InitDevices();
    //Set start direction of motors
    SetDir( MOTOR_ONE, CLOCKWISE );
    SetDir( MOTOR_TWO, CLOCKWISE );
}
```

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External Dependencies Init Dev	<pre>motor2.h" tialize MOTOR-2 board vices(); start direction ( MOTOR_ONE, CLOCKWISE ); ( MOTOR_TWO, CLOCKWISE );</pre>
[]∢]] ■ C:\binom\devt	ools\WinAVRExamples\MOTOR-2\Motor2Init\Motor2Init.c 4
C:\bipom\devt	ools\WinA¥RExamples\MOTOR-2\Motor2Init\Motor2Init.c
C:\bipom\devt	ools\WinAVRExamples\MOTOR-2\Motor2Init\Motor2Init.c 4 >

3.13 In order to use functions from MOTOR-2 Library you should include motor2.h file. Then you can call any available functions.

3.14 In order to build your example do **Build** à **Build** (or press F7 on keyboard). As result you should see following log in **Build** window

the AVD CO.		
	o - [C:\bipom\devtools\WinAVRExamples\MOTOR-2\Motor2Init\Motor2Init.c]	
Ele Pr	ect <u>B</u> uild <u>E</u> dit <u>V</u> iew <u>T</u> ools <u>D</u> ebug <u>W</u> indow <u>H</u> elp	- 8 ×
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AVR GCC	C:\bipom\devtools\WinA¥RExamples\MOTOR-2\Motor2Init\Motor2Init.	. 4 🕨
Build		<b>▼</b> ×
<ul> <li>avr-gcc.</li> <li>avr-gcc.</li> <li>avr-objo</li> <li>avr-objo&lt;</li></ul>		ls\WinA'
Source conserver eres	cceeded with 0 Warnings	(-)
<		>
Build	essage 🛛 🔜 Find in Files 🛛 🌄 Breakpoints and Tracepoints 🔪 👘	
	ATmega168 AVR Simulator Auto 🌑 Ln	3, Col 4 🚲

3.15 When Build is finished AVR Studio generates HEX file Motor2Init.hex. You can use AVR Studio to download it to MOTOR-2 board.