

Run “Hello World” on DRAGON12 and MiniDRAGON+ Using ImageCraft’s ICC12 and D-Bug12

Application Note AN0002

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Abstract: This application note will help you get started using ICC12 with DRAGON12 and MiniDRAGON+ evaluation boards. The classic test program “Hello World” is used as an example. The example was tested on both DRAGON12 and MiniDRAGON+ boards that operate in EVB mode. It should also work on other HC12 and HCS12 boards.

Important: *In this application note, ICC12 Version 6.16 was used to compile the “Hello World” example program. Since the registers of 9S12DP256 are moved to different locations from that of the traditional 68HC12 microcontrollers, a patch file, called “putchar_dp256.c”, must be added to your project to have the characters displayed on your PC screen. ICC12 Version 6.16 does not contain this file. You can get it from ImageCraft. For your convenience, I have put “putchar_dp256.c” in the zip file for this application note. You can also find it in Listing_1 in this application note.*

There is a “Hello World” example program that comes with ICC12 V6.16. You can find it at “c:\icc\examples.12\hello.c” if you have already installed ICC12 on your C drive. The following steps are applicable to both DRAGON12 and MiniDRAGON+ boards.

1. Create a New Project:

Once you invoke the IDE, choose Project -> New from the menu system. Navigate to the “c:\icc\examples.12\” and type in a project name, such as “hello.prj” and click “Save”.

2. Add Files “hello.c” and “putchar_dp256.c” to Your Project:

In the project window, which is on the right side of the IDE, right click on “Files” and click “Add File(s)...”. In “Add Files...” dialog frame, navigate to the “c:\icc\examples.12\”. Select both “hello.c” and “putchar_dp256.c” by holding SHIFT key. Then, click “Open”. Now, the two C files are added to your project.

3. Set Project Options:

Choose Project -> Options from the menu system. The “Compiler Options” dialog window appears as shown in Figure 1.

Click on “Target” tab, select “9S12DP256 12K RAM Mode” under “Device Configuration”. Under “Memory Addresses”, “Program Memory” is set as 0x1000 and “Stack Pointer” is set as 0x4000 by default. The settings are shown in Figure 2.

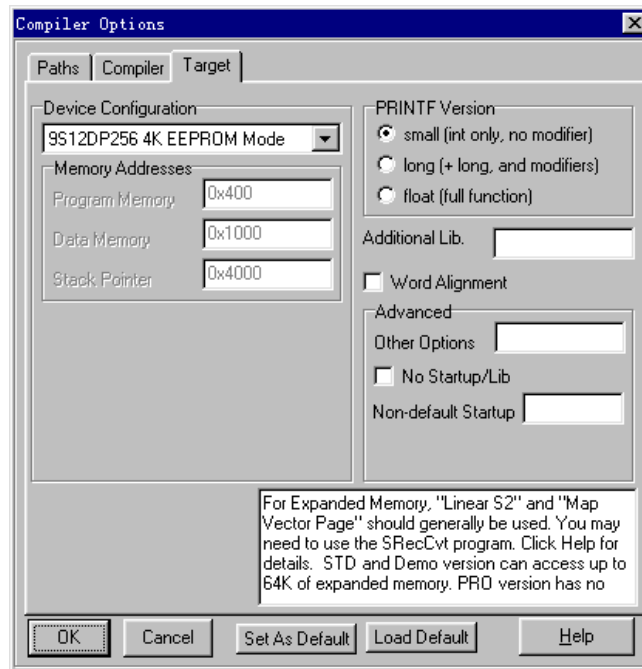


Figure 1 Compiler Options Dialog

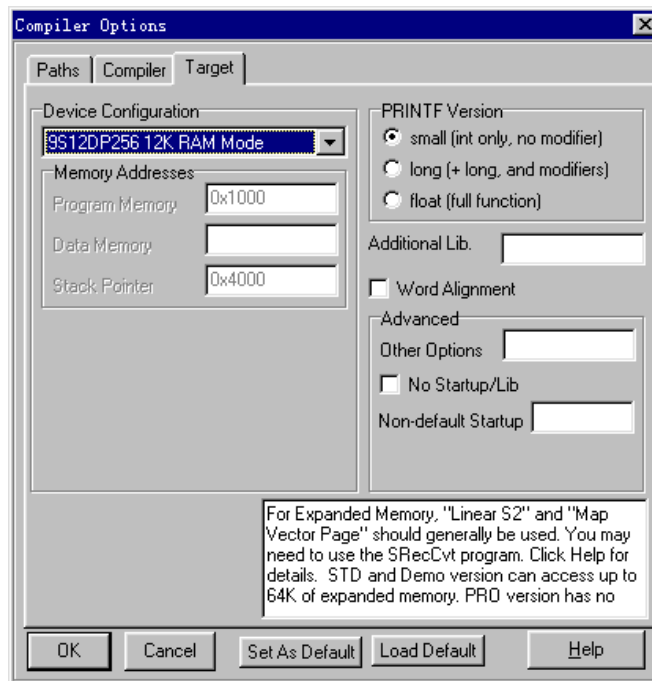


Figure 2 Set Target

Next, click on “Compiler” tab. Make sure “Accept Extensions (C++ comments, binary constants)” is checked as shown in Figure 3.

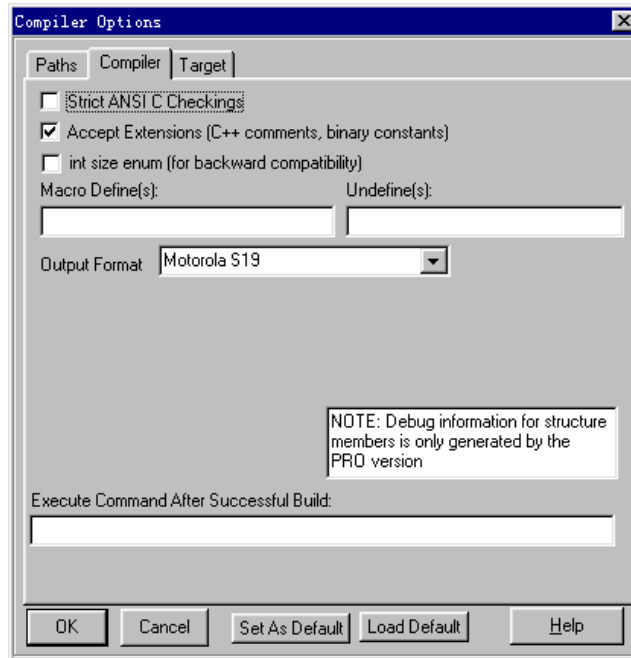


Figure 3 Set Compiler

Finally, click on “Paths” tab. Make sure the “Include Path” and the “Library Path” are correctly set as shown in Figure 4. Then, click “OK”.

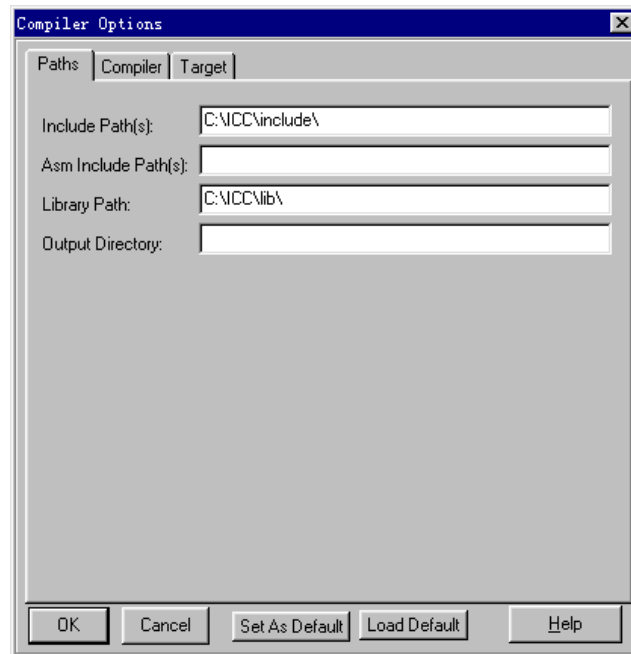


Figure 4 Set Paths

4. Build Your Project:

Choose Project -> Make Project or press F9 to build the project. You should get a “hello.s19” file in your folder.

5. Load and Run Your Program:

Choose Tools -> Environment Options from the menu system. Click on “Terminal” tab, select the serial port that connects your computer and your DRAGON board, set Baudrate at 9600, select “None” under “Flow Control” and select “None” under “ASCII Transfer Protocol” as shown in Figure 5. Then, click OK.

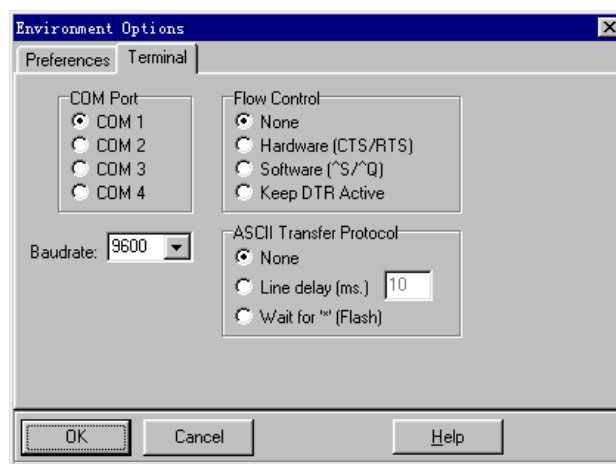


Figure 5 Set Terminal

Choose Terminal -> Show Terminal Window from the menu system. The terminal window appears as shown in Figure 6.

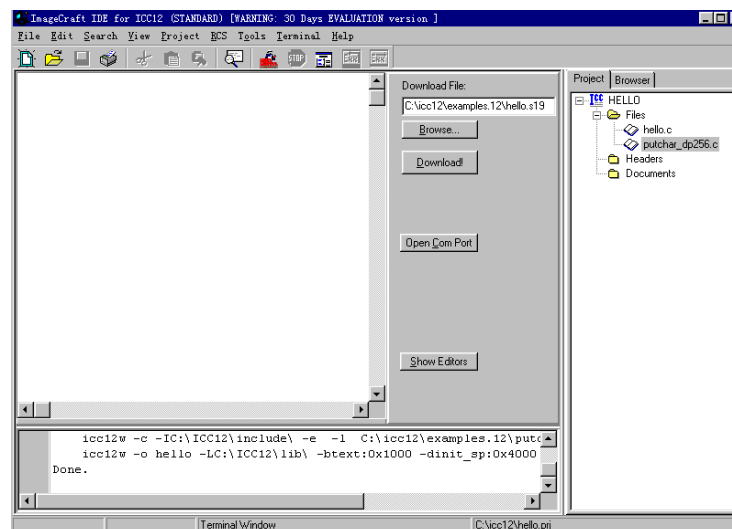


Figure 6 Terminal Window

Click on “Open Com Port” to open the serial port. Then, press the reset button on your DRAGON12 or MiniDRAGON+ board. D-Bug12 is started as shown in Figure 7.

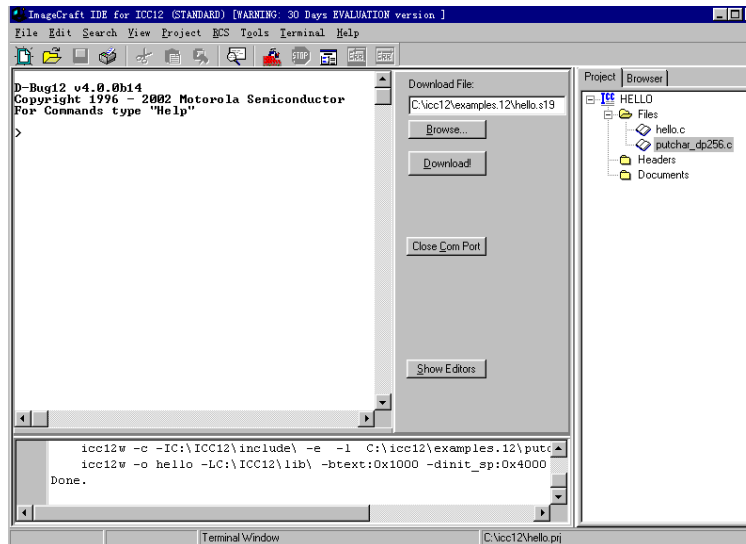


Figure 7 Start D-Bug12

Type “Load” in the terminal window and press “Enter” on your keyboard. Then, click on “Browse”, navigate to “c:\icc\examples.12\”, select “hello.s19” and click “Open”. Now, click “Download” to load “hello.s19” to your board.

After the s19 file is downloaded to your board, type “g 1000” and hit “Enter” on your keyboard to run the program. You should get the same result as shown in Figure 8.

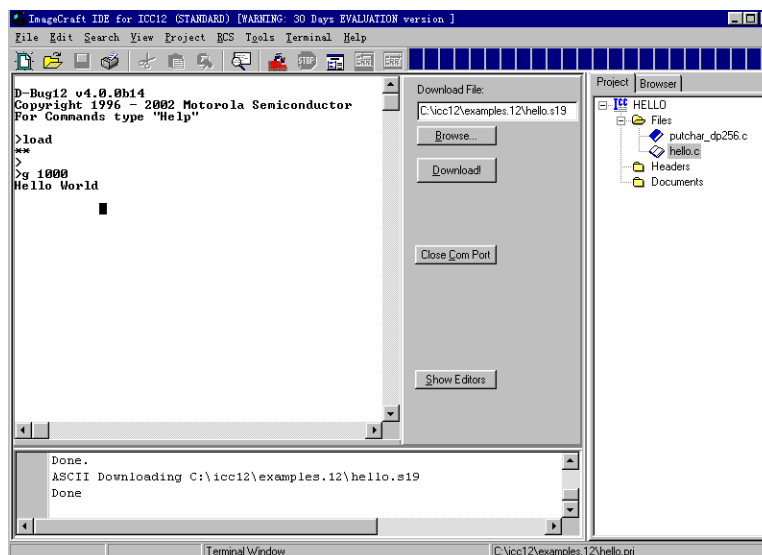


Figure 8 Run Hello World

Listing 1. putchar_dp256.c

```
#include <stdio.h>
#define _SCI
#include <hcs12dp256.h>

extern int _textmode;

int putchar(char c)
{
    if (_textmode && c == '\n')
        putchar('\r');
    while ((SC0SR1 & TDRE) == 0)
        ;
    SC0DRL = c;
    return c;
}
```