

How to use EGNU and GCC with NE64 TCP/ip stack plus uBUG12

Download and install both EGNU and GCC. Links are:

http://www.geocities.com/englere_geo/
<http://www.ericengler.com/EmbeddedGNU.aspx>
<http://www.gnu-m68hc11.org/>

EGNU IDE download link

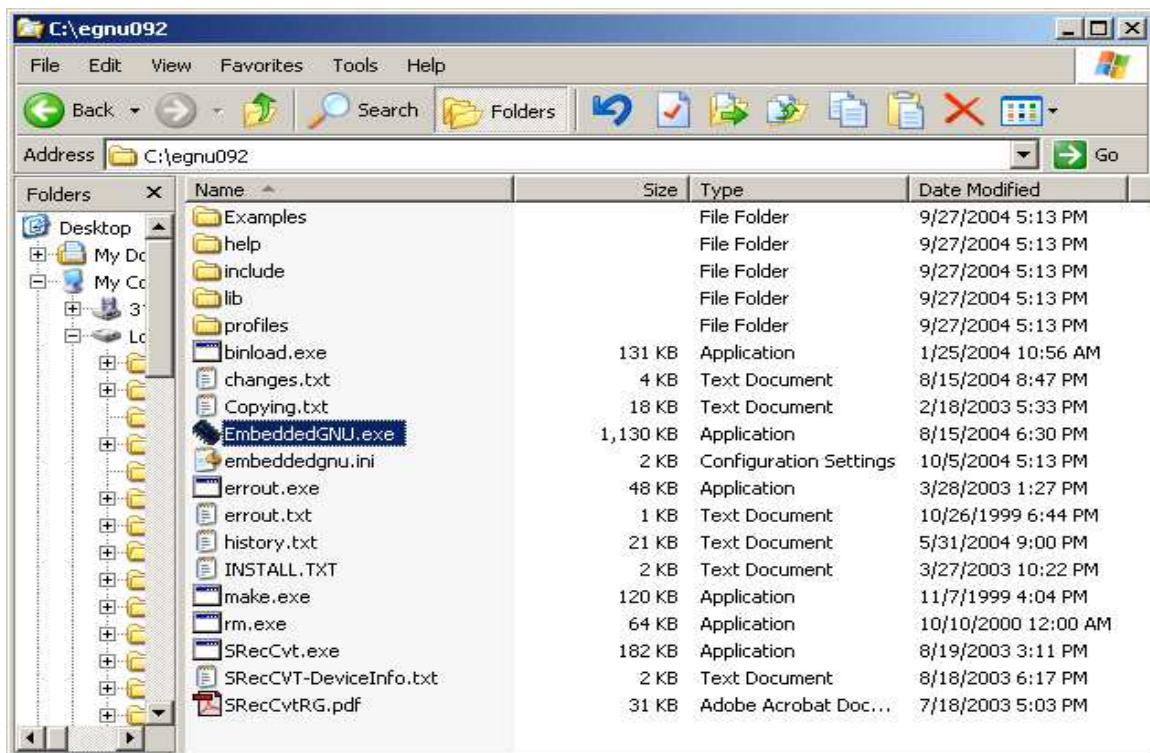
<http://www.ericengler.com/downloads/egnu092.zip>

GCC download for Win98, XP and 2K

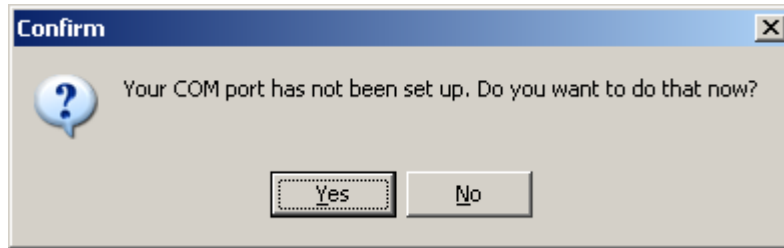
http://stephane.carrez.free.fr/m68hc11_pkg_zip.php
<http://stephane.carrez.free.fr/EXE/gnu-68hc1x-3.0.exe>

Initial Setup:

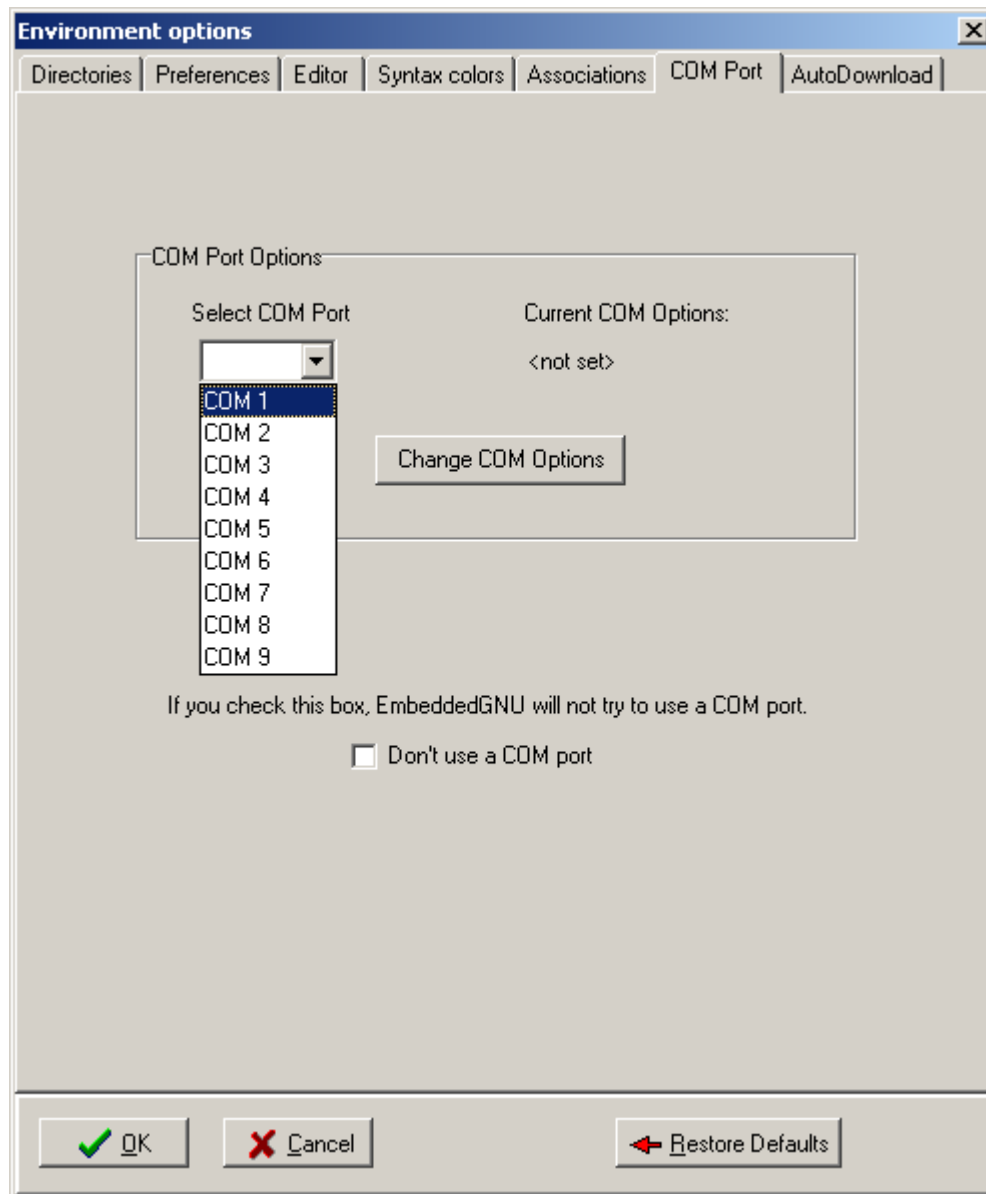
Locate the **EmbeddedGNU.exe** where it is installed too and double click on the icon.



It will prompt for setting up the COM. Select the Yes or No button. It is NOT necessary to setup the COM but if one wants too then the following sequence is how to. Please note that if COM is enabled it will interfere with uBUG12 if there is only one COM port in the PC. If there are 2 serial ports in the PC then this problem will not exist.



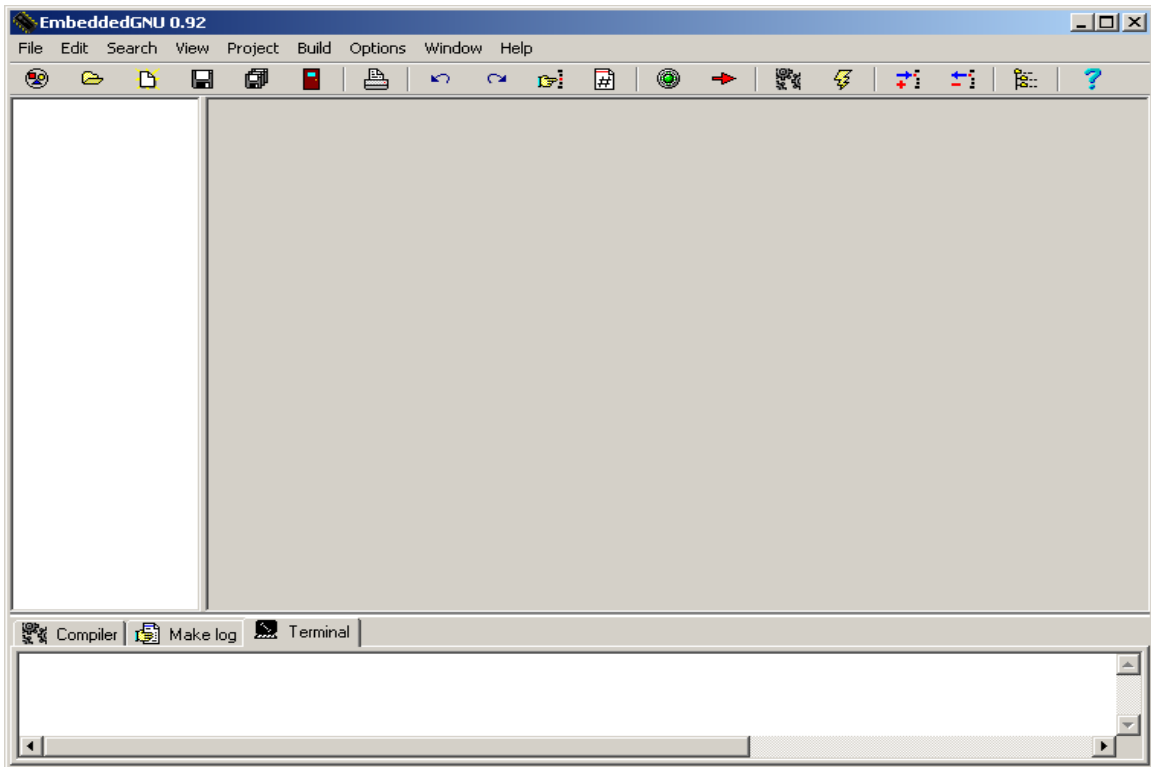
If yes is selected then choose a COM port by clicking on the pull down arrow. The environment setup can be change by the Change COM options button.



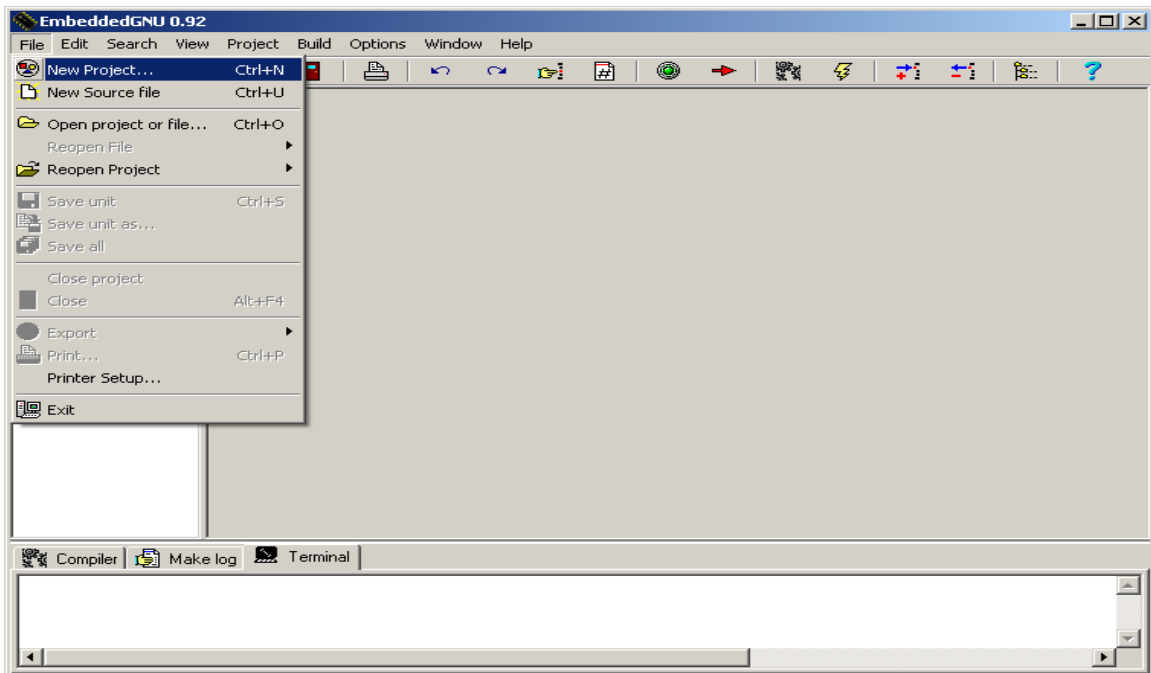
Here COM 1 is selected then press OK button.



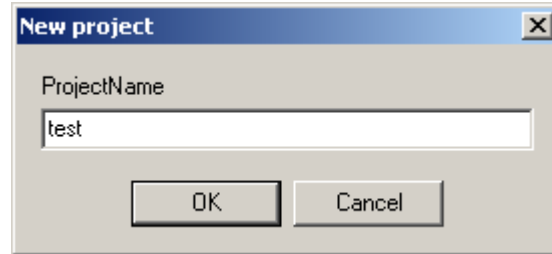
After the setup note the right window pane is greyed out and left window is blank. As usual with IDEs one is left with a BIG question what to do next. Let us then create a Project.



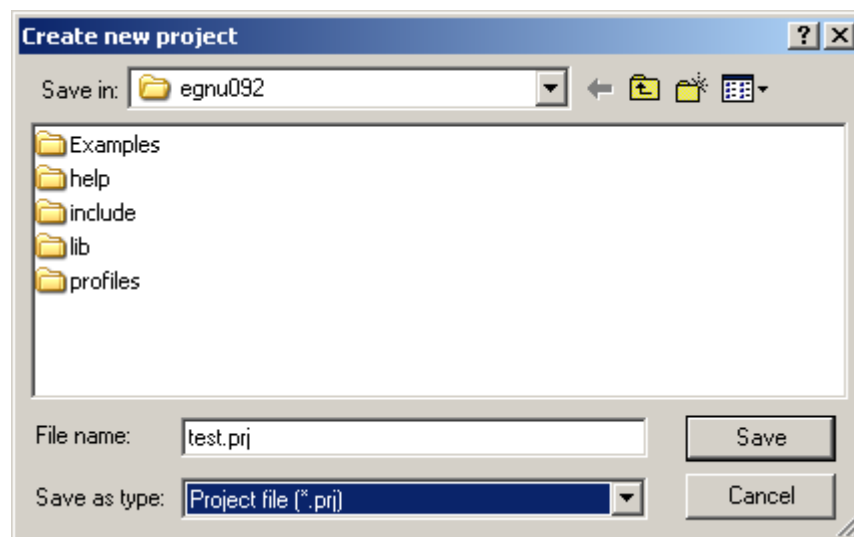
To create a new Project select File - New Project.



Give a name that makes sense. Here it is called test then press OK



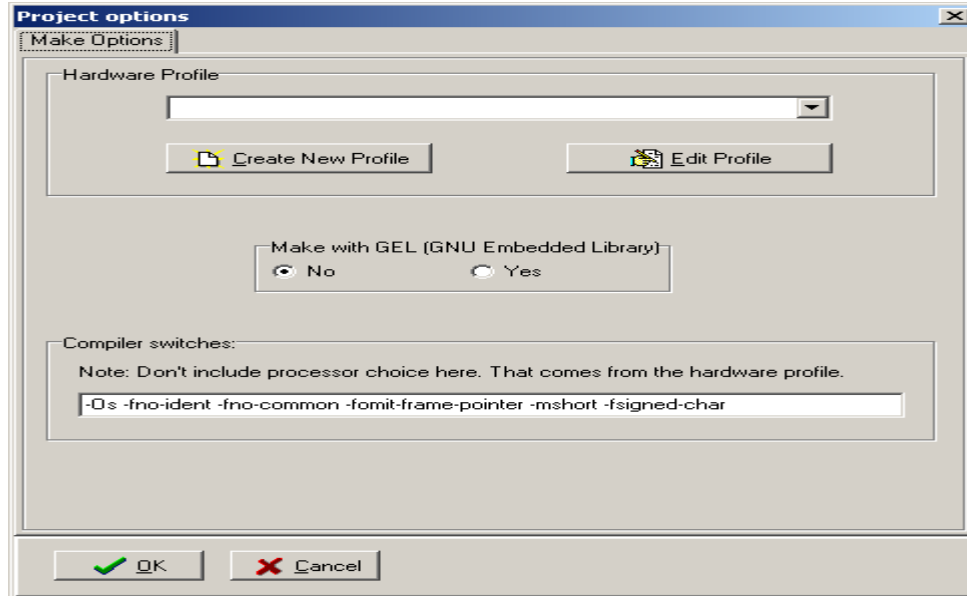
Showing where to save the new project. User should decide whether to create a new folder or save it to an existing folder. Press Save button to Save project.



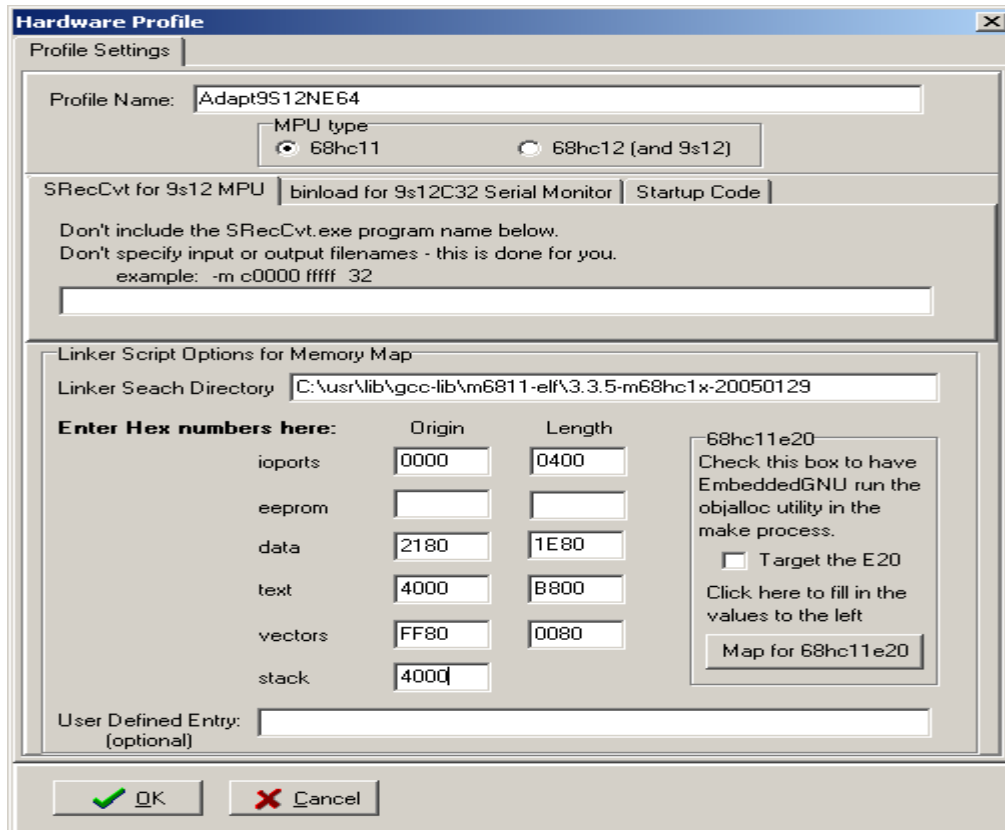
The setup is the Project options. Here one can create a new profile or edit an existing profile.

What is profile? Profile is the type of board and MCU resources that one is working with. If a profile does not exist for one particular board/MCU model then one can create one. One can also edit an existing profile.

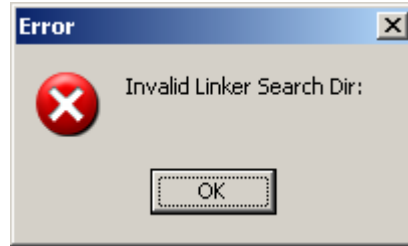
The Project Options is VERY important to the setup.



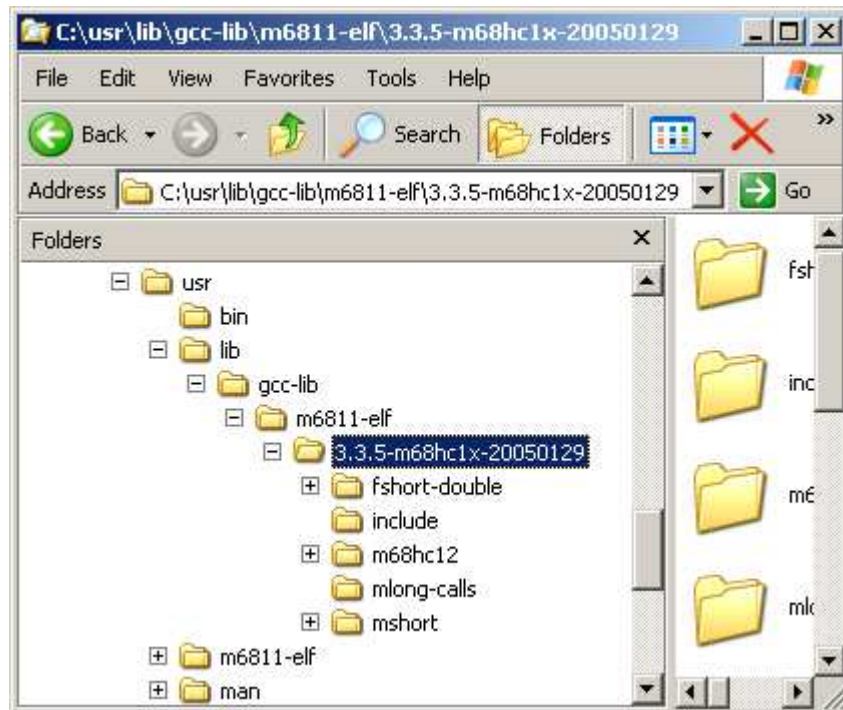
Creating a profile for the MCU if it is not yet available. Below are the parameters. In this example we will be using the 9S12NE64 with Technological Arts Adapt9S12NE64. By selecting the Edit profile button one can see the hardware profile as shown.



If the linker is not setup properly there is an error similar to this.



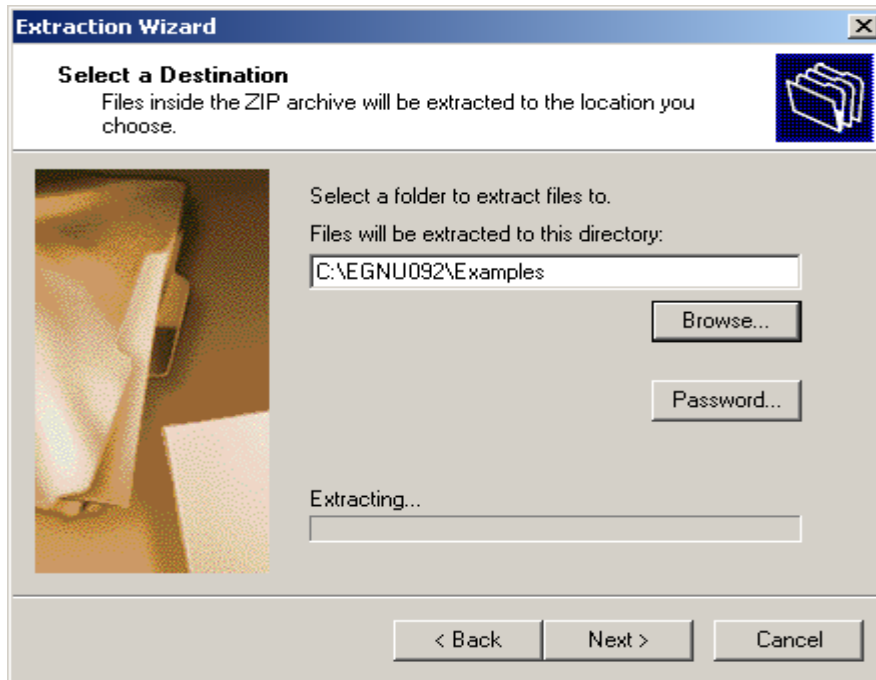
Locate where the GCC is installed and note the version number.



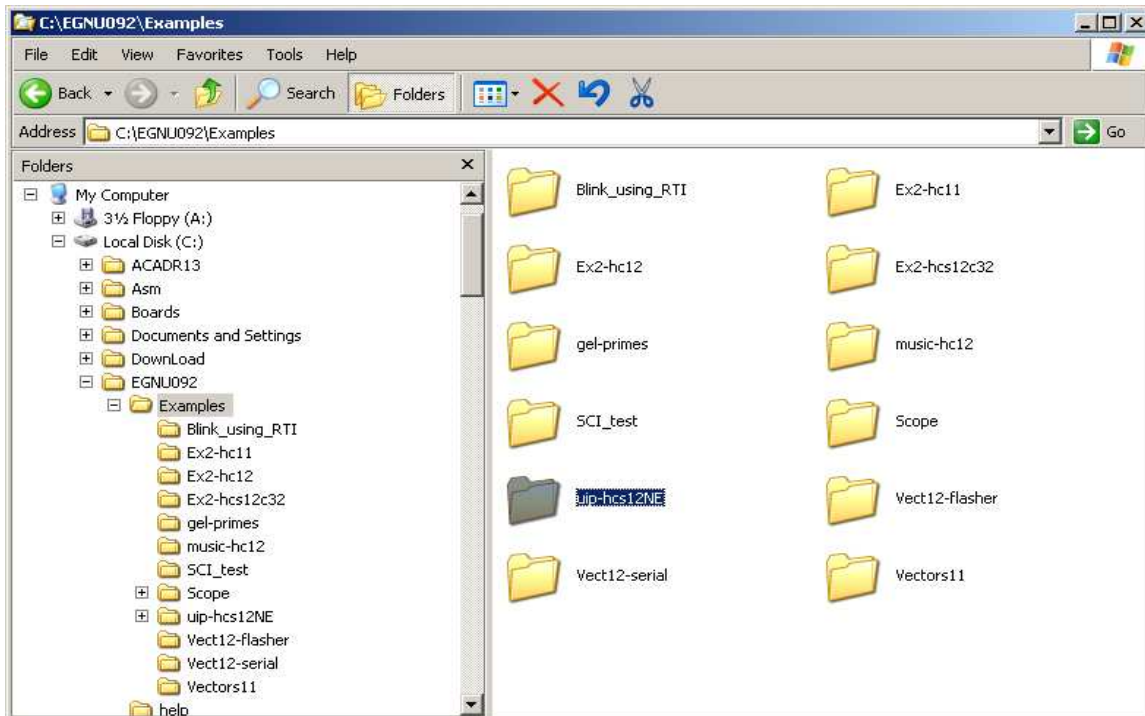
Edit Linker Search Directory to
C:\usr\lib\gcc-lib\m6811-elf\3.3.5-m68hc1x-20050129 then press OK and the
error will go away.

TCP/IP Stack:

The above setup was necessary to reach this point. Locate **uIP-HCS12NE-release-1.0.zip** and unzipped to directory **C:\EGNU092\Examples** as shown.



Below is the added directory to **C:\EGNU092\Examples**



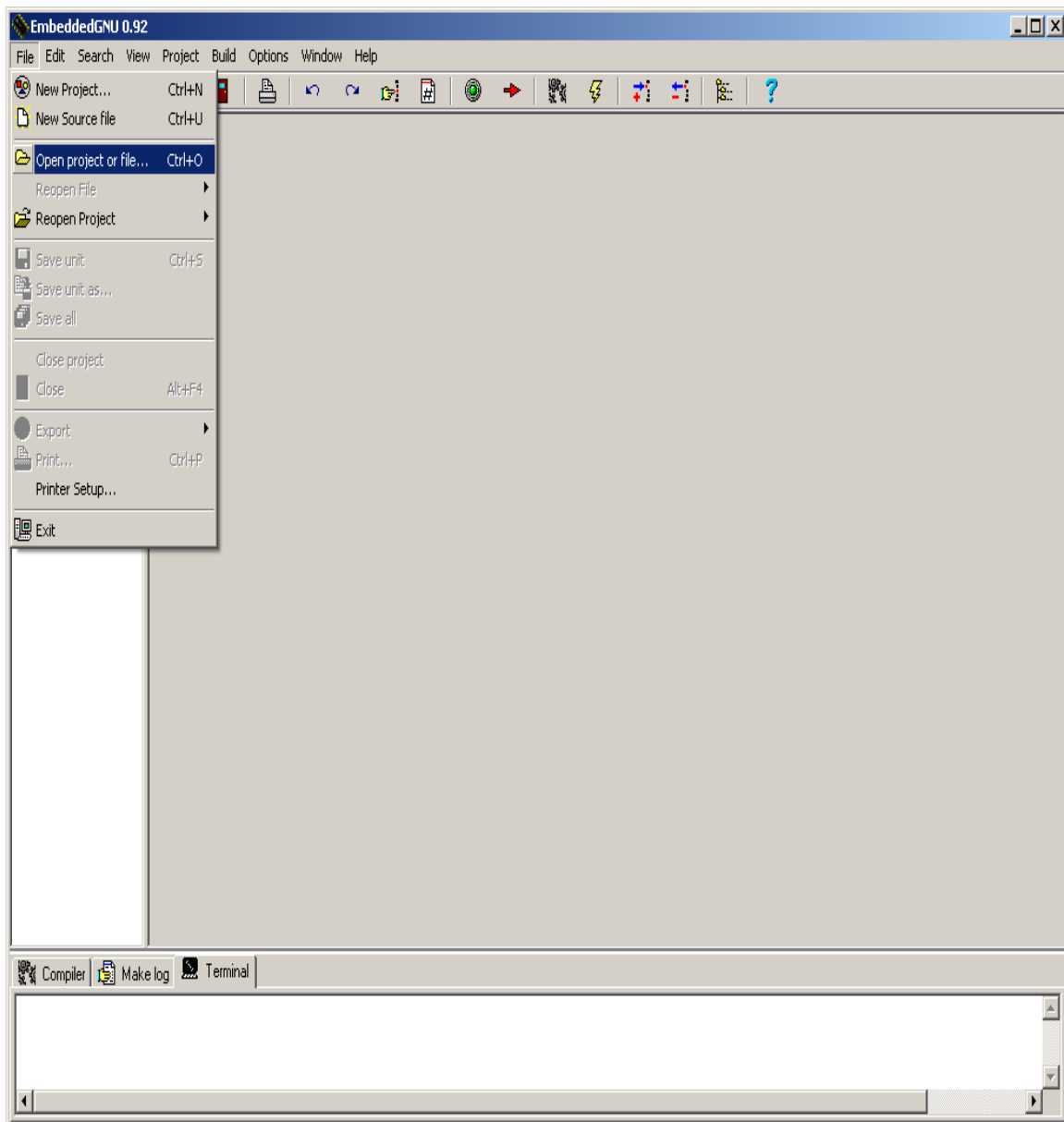
Profiles:

Locate the following files **9S12NE64-0.mem**, **9S12NE64-1.mem**, **9S12NE64-2.mem**, **9S12NE64-3.mem** and **9S12NE64-4.mem** in the subdirectory **C:\EGNU092\Examples\uiip-hcs12NE**

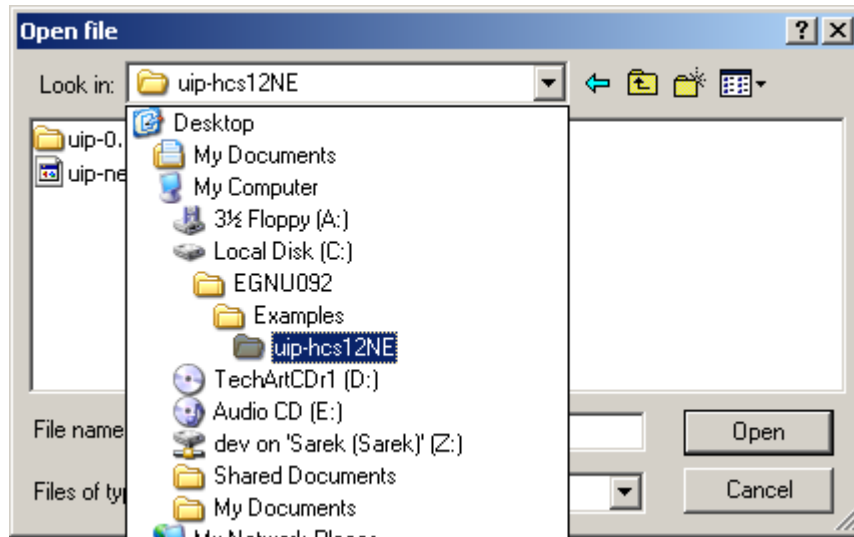
Copy these files to the profile **C:\EGNU092\profiles**

Opening Existing Project:

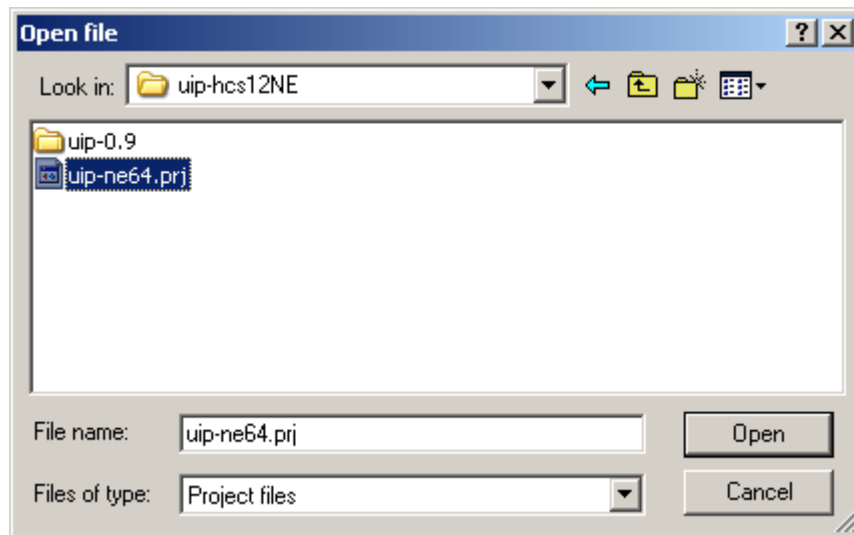
To open an exiting project select on File – Open project or file as shown.



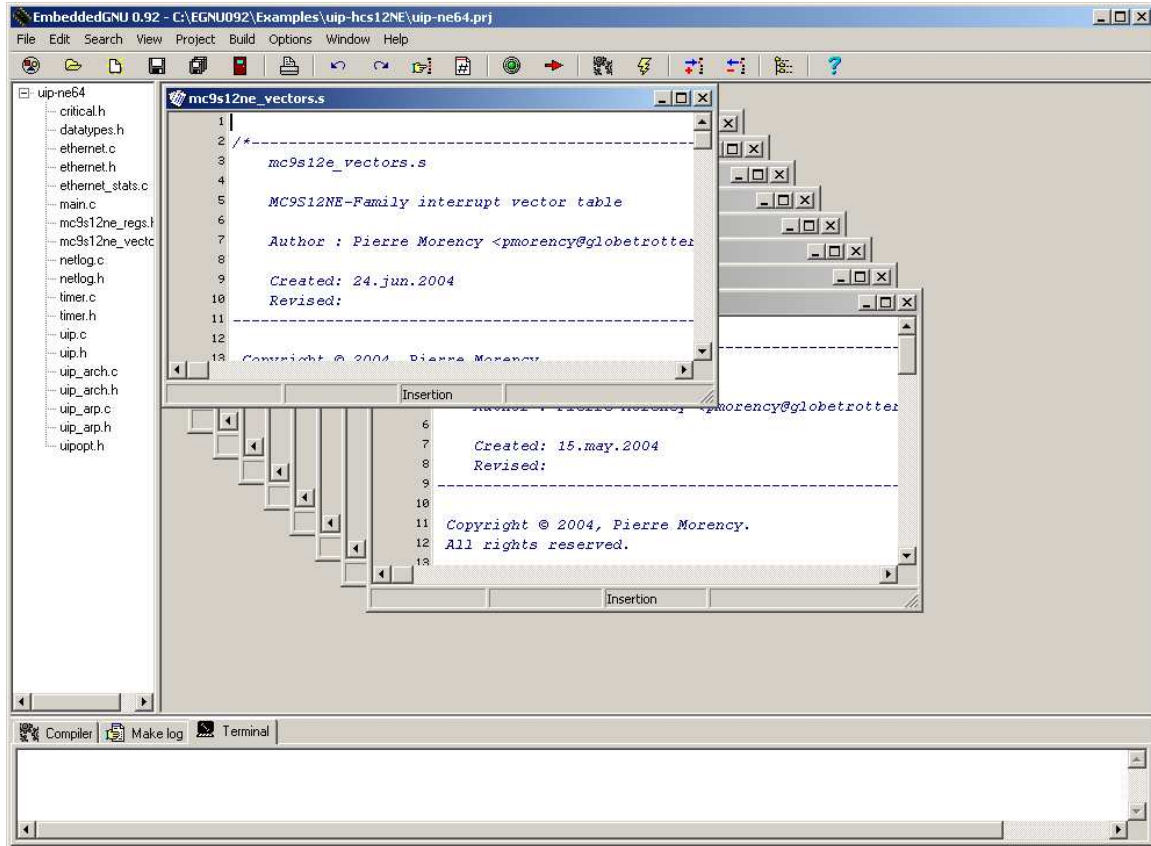
The IDE will open an explorer window to help locate to the file of interest. Locate the directory ***uip-hsc12NE*** and search for the file called ***uip-ne64.prj***



Click on the ***uip-ne64.prj*** to select and click on the open button.



The IDE will open all of the files related to the project.



Click on main.c file and locate the lines of code below.

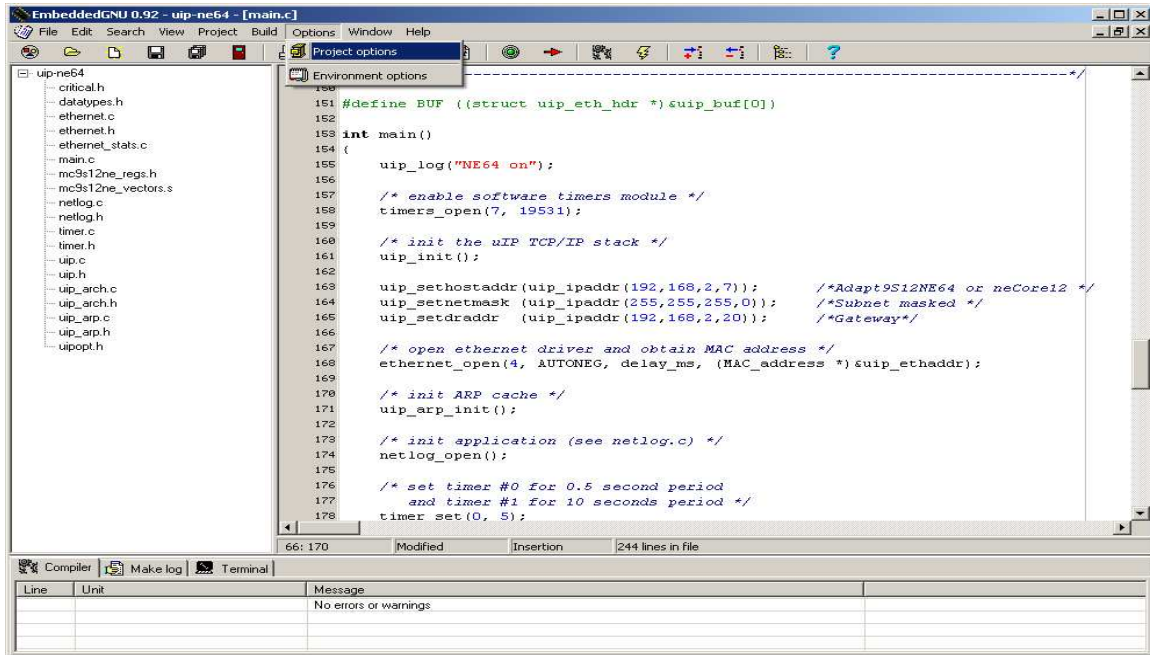
```
uiip_sethostaddr(uiip_ipaddr(192,168,2,7)); /*Adapt9S12NE64 or neCore12 */
uiip_setnetmask (uiip_ipaddr(255,255,255,0)); /*Subnet masked */
uiip_setdraddr (uiip_ipaddr(192,168,2,20)); /*Gateway*/
```

```
/* open ethernet driver and obtain MAC address */
ethernet_open(4, AUTONEG, delay_ms, (MAC_address *)&uiip_ethaddr);
```

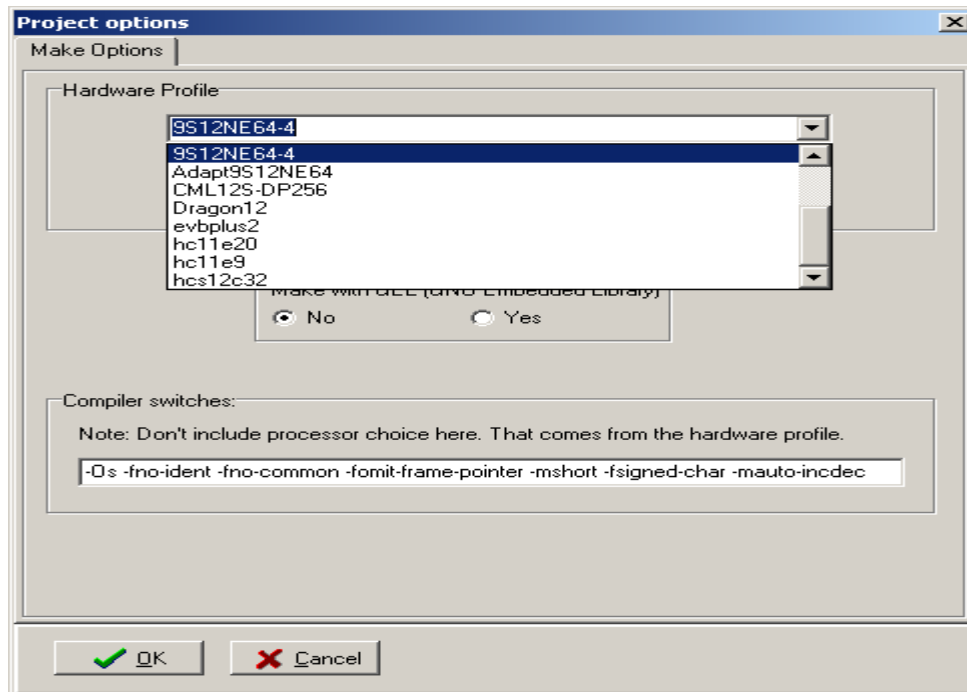
Change the values to ones application. Please note the number **4** in **ethernet_open** line. This is related to **9S12NE64-4.mem** memory mapping of the NE64 internal RAM allocation.

Choosing Profile:

Choose the profile as **9S12NE64-4.mem**. Click on Options menu then Project options.

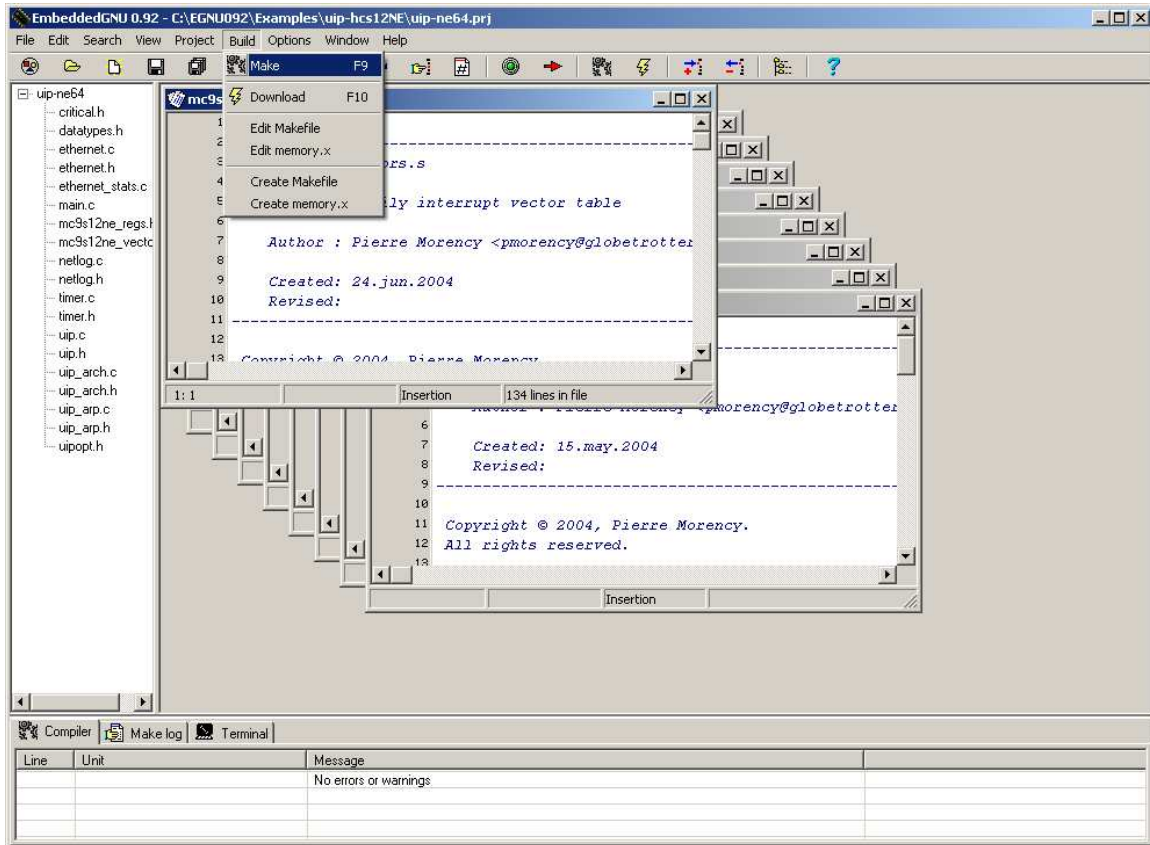


Select **9S12NE64-4** to make sure it matches the intended application. Press OK to continue.

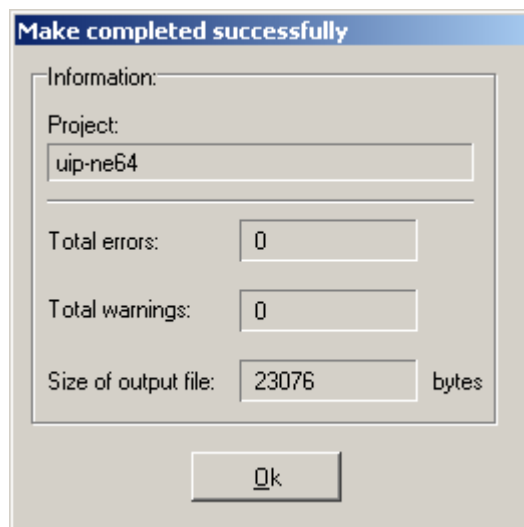


Compiling/Build:

We can now compile the project as is and move on to programming the NE64. Click on **Build** menu as shown and select **Make**

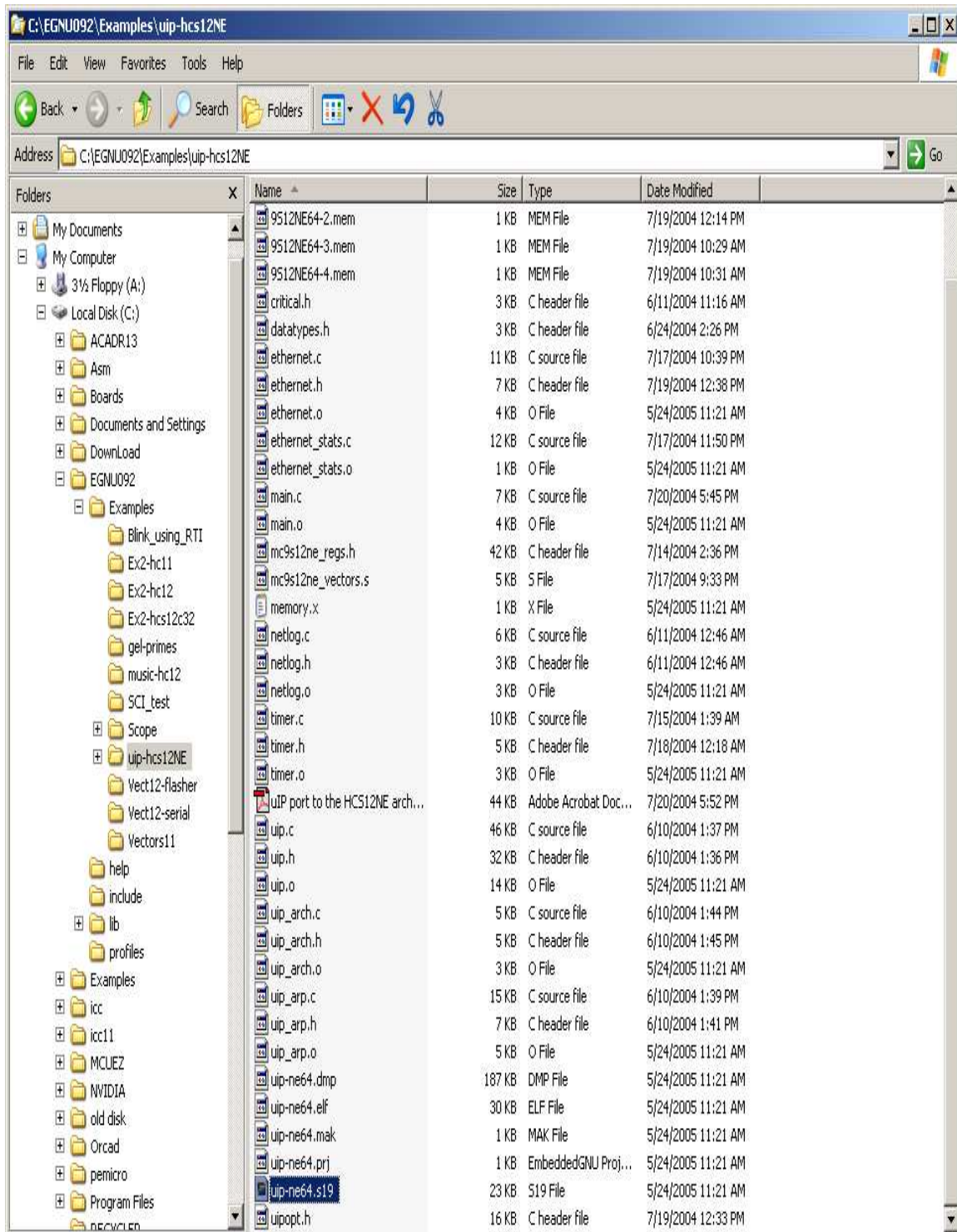


Here one can see the feedback output of the build.



It is always a good idea to check the S-record. One should be aware what is an S-record and what it represent.

Here we can see that ***uip-ne64.s19*** was generated along with other files related after the build.



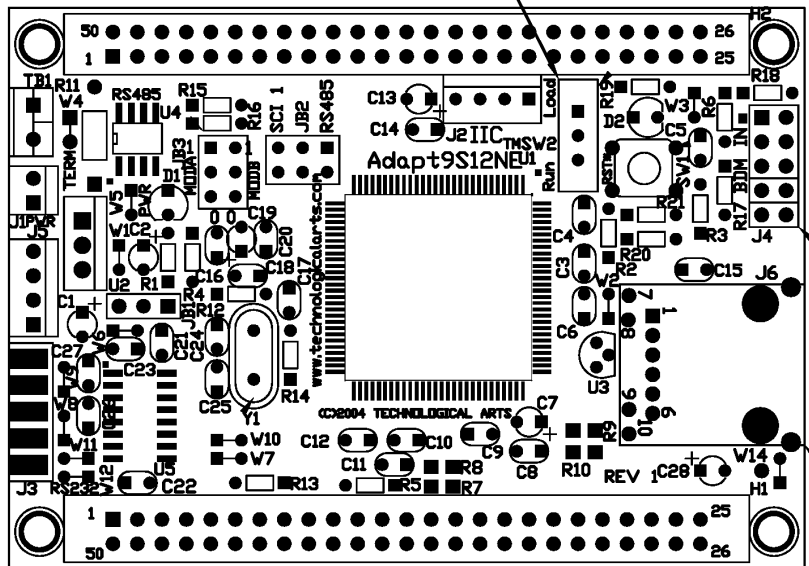
Programming:

It is time now to program the S-record into the Adapt9S12NE64 or neCore12M64 using uBUG12. Other method can be used to erase and program the MCU but in this case we will use uBUG12. This document assumes that the Serial Monitor is not erased. It further assumes that COM 1 is enabled and is used by EGNU leaving COM 2 for uBUG12.

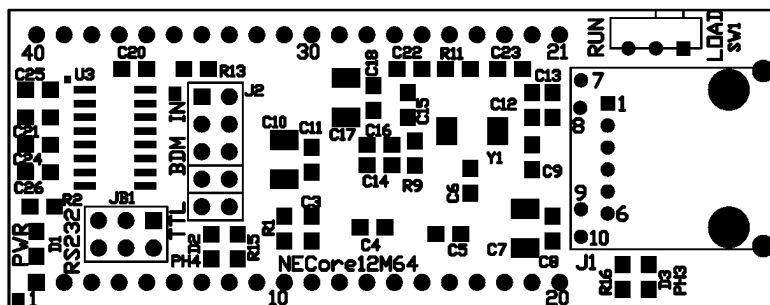
If no COM is to be used then it is better to start a new Project with the COM disabled.

Switch the Run/Load switch to Load position and apply power to the board.

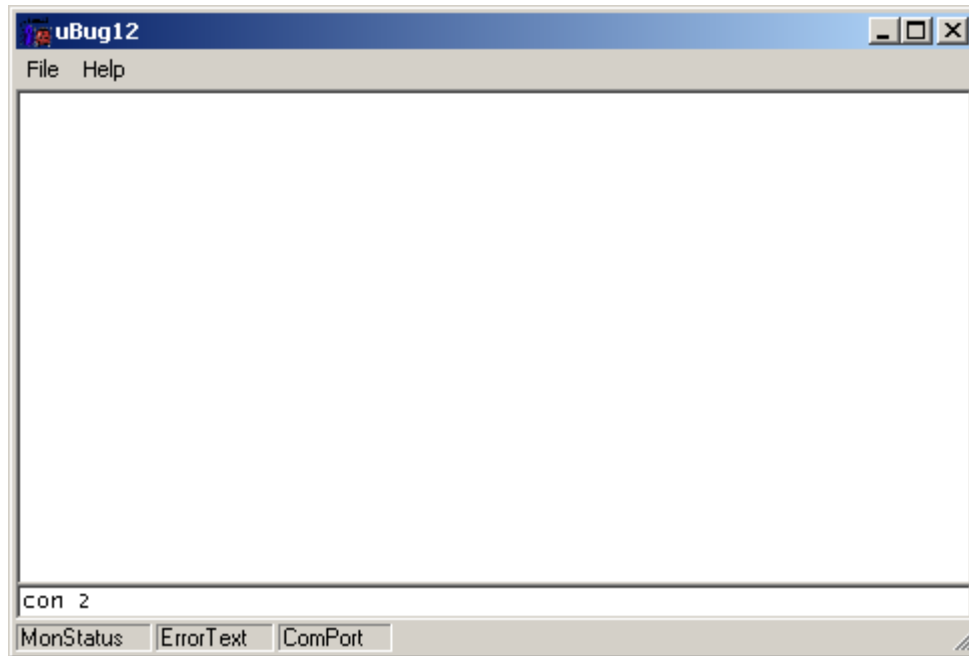
Run/Load Switch



Run/Load Switch



Double click on the uBUG12 icon to initiate GUI. Type **con 2** for COM 2 serial port.

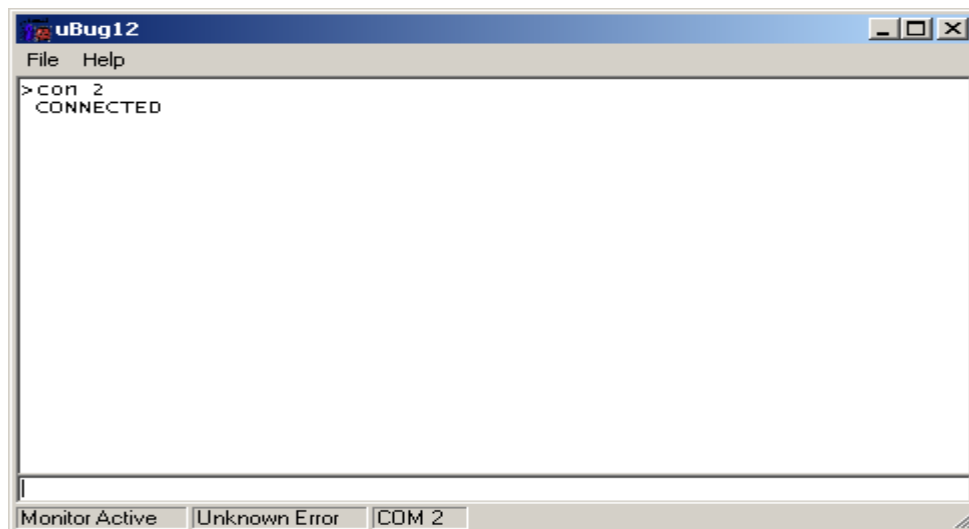


Connections establish between PC and Adapt9S12NE64 or neCore12M64

2 possible errors can occur:

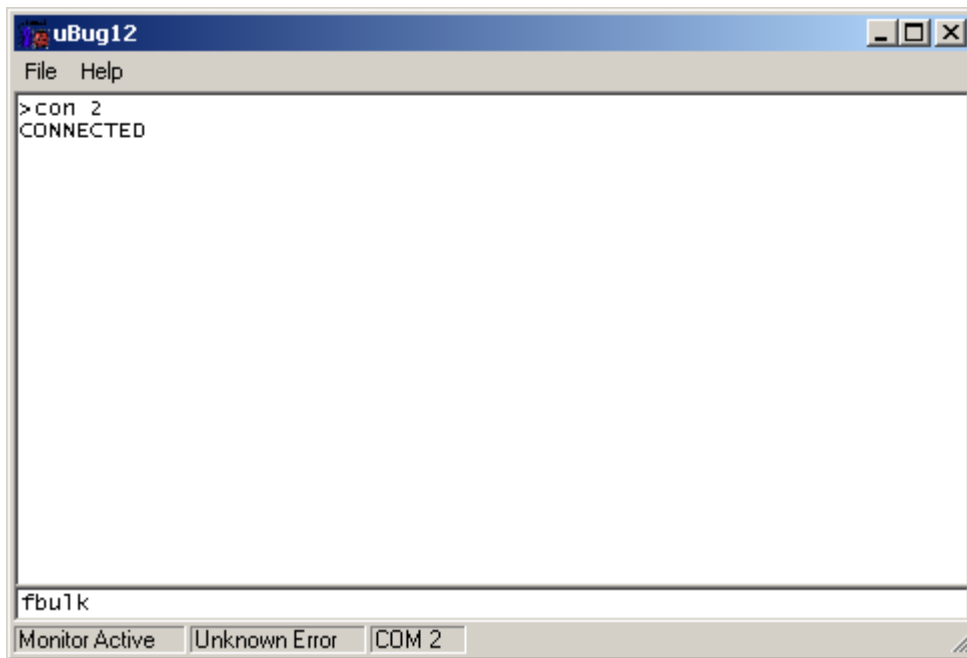
Connection Error: Unable to open COM2 <- Another application is using the COM port

Connection Error: Read Error: Timeout error <- The MCU not currently in LOAD mode or the cable is disconnected from either PC or Docking Module. Lastly, the cable could be connected at the wrong COM port.

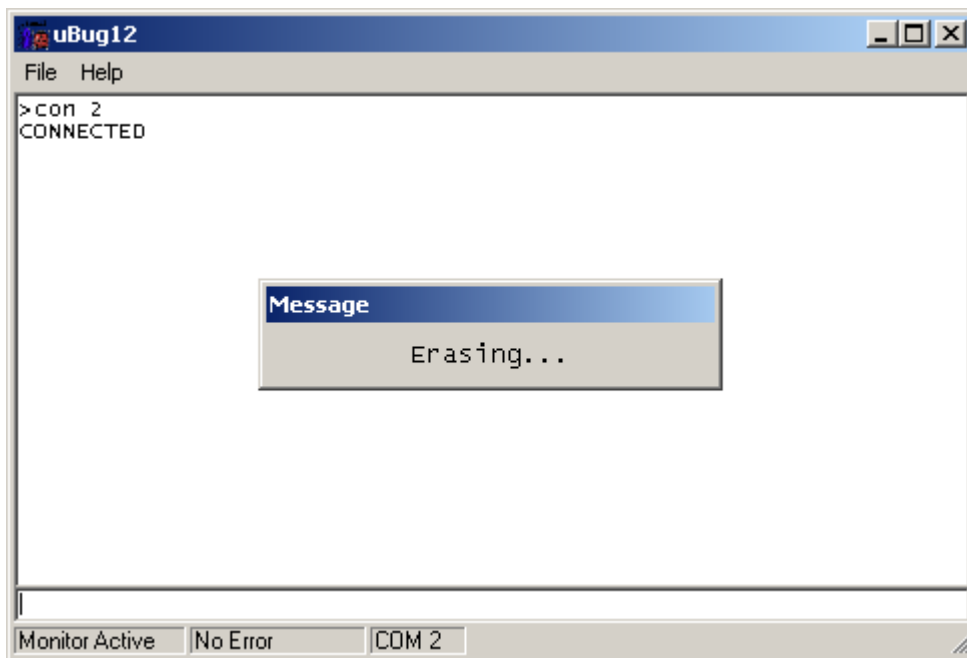


Erasing:

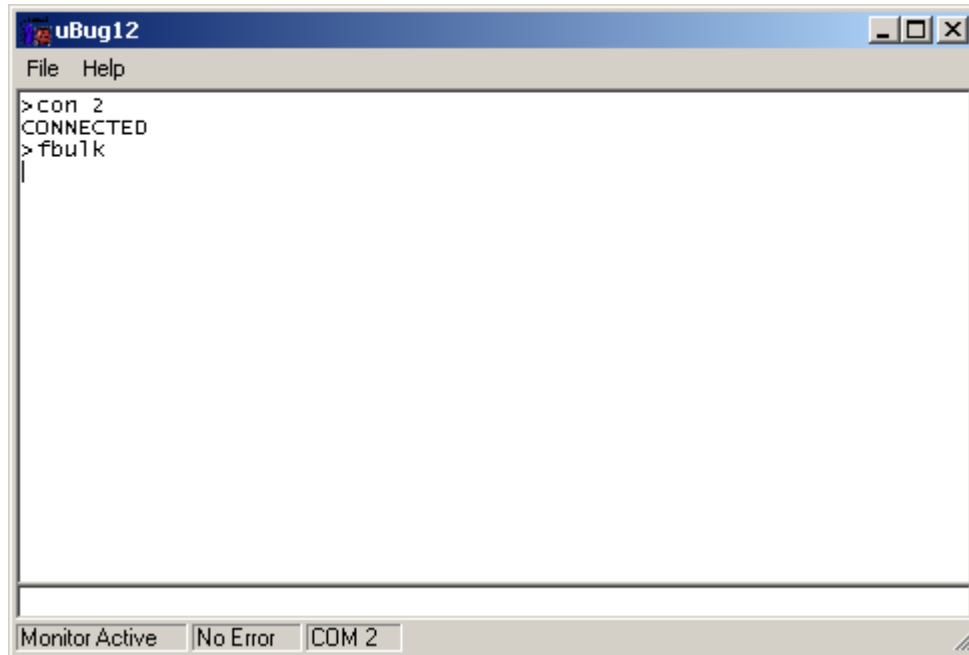
To erase flash type *fbulk*



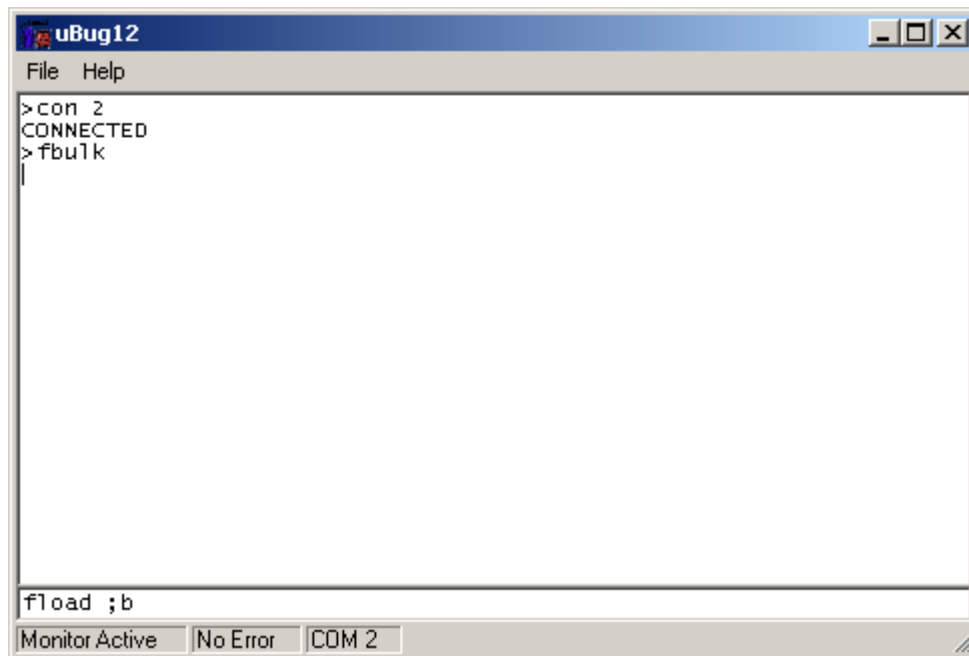
Erasing message



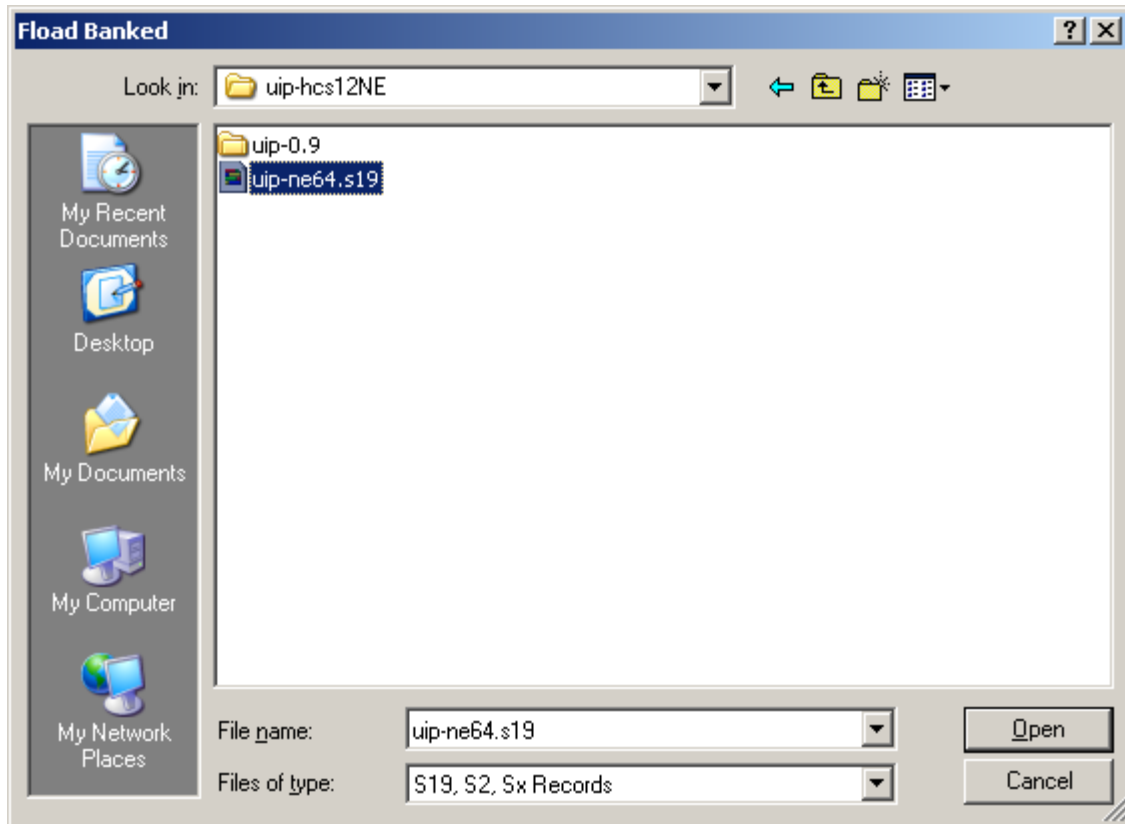
Erase successful



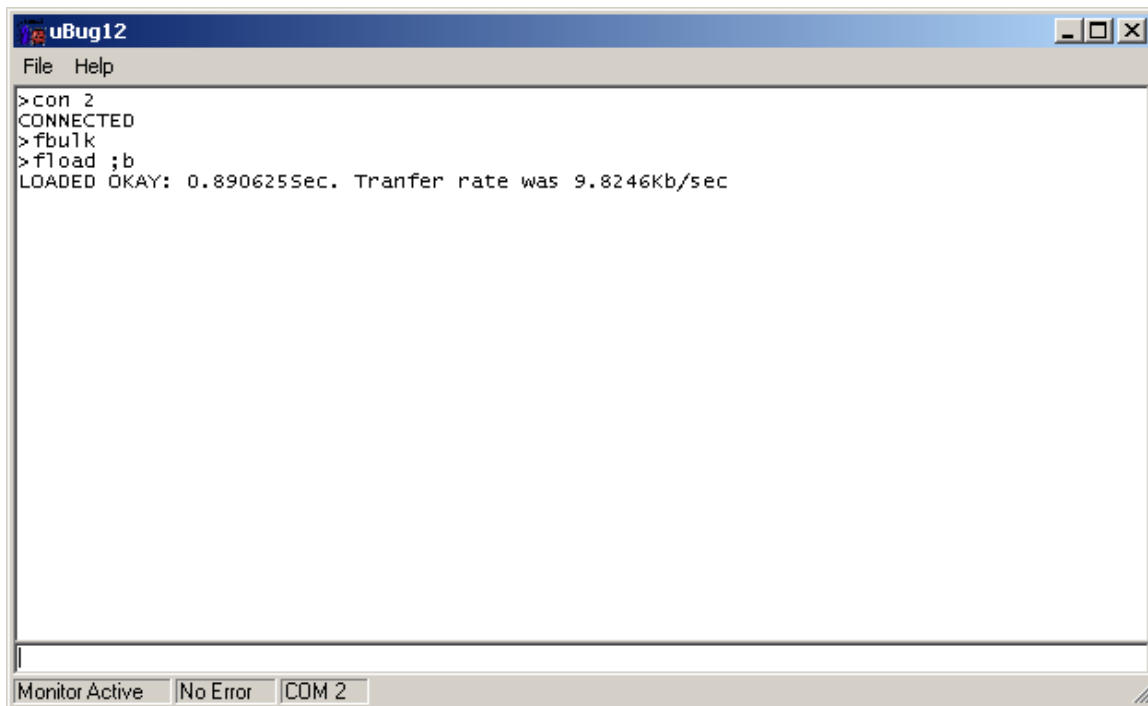
To program S-record. EGNU generates Linear S-record. This is considered to Banked record by uBUG12. The command is **Fload ;b** for banked and **Fload** for non Banked S-record.



uBUG12 will open an Explorer window to help and locate the S-record as shown. Click on the file **uip-ne64.s19** to select click **Open** button.



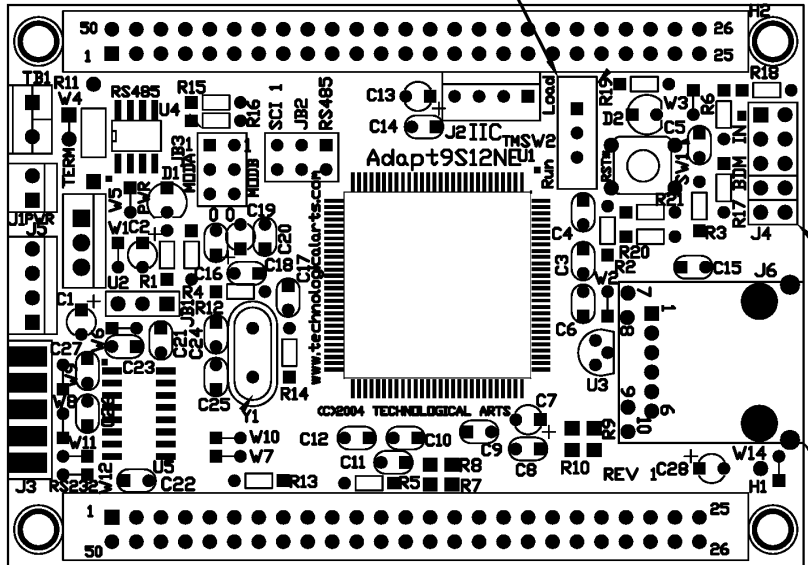
uBUG12 will immediately program the target.



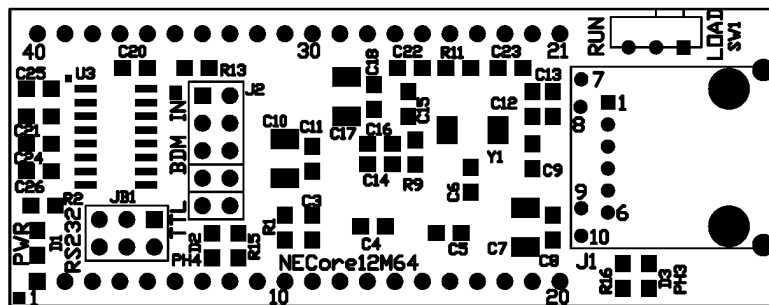
Running the Program:

Switch the Run/Load to Run, press the RESET button and the TCP/ip stack should now be running.

Run/Load Switch

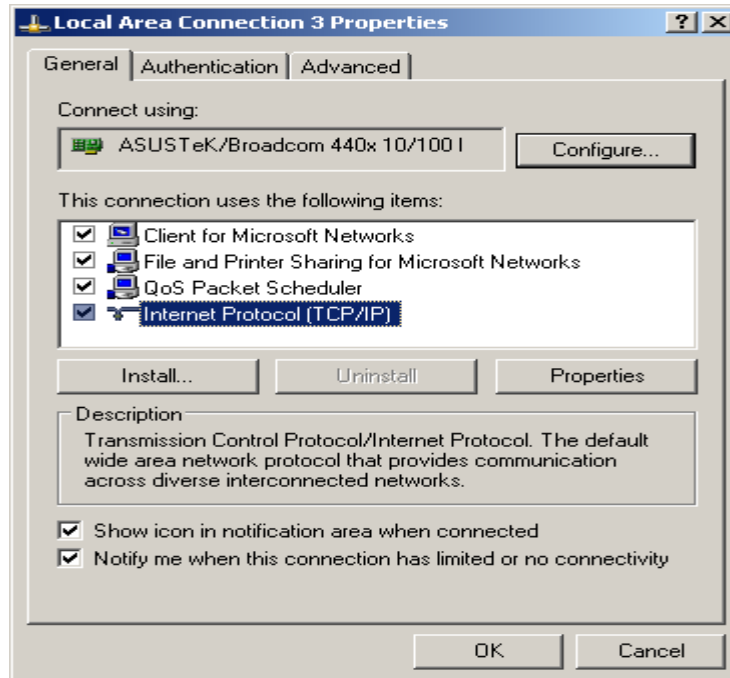


Run/Load Switch



Ethernet Setup:

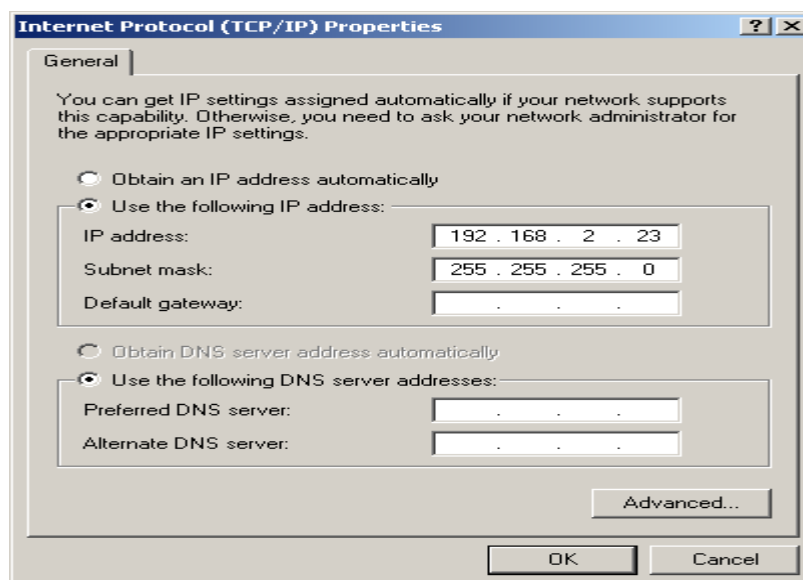
Locate the Ethernet card connection properties and select Internet Protocol. Click on the Properties button.



Check box the **Use the following IP address** as well as change the IP address and Subnet mask to the following numbers. Click OK button to accept changes.

IP Address: 192.168.2.23

Subnet Mask: 255.255.255.0



Ethernet Cables:

For using HUBs, the cable is straight thru. Connect the cable from an available HUB port to the Adapt9S12NE64 or neCore12M64.

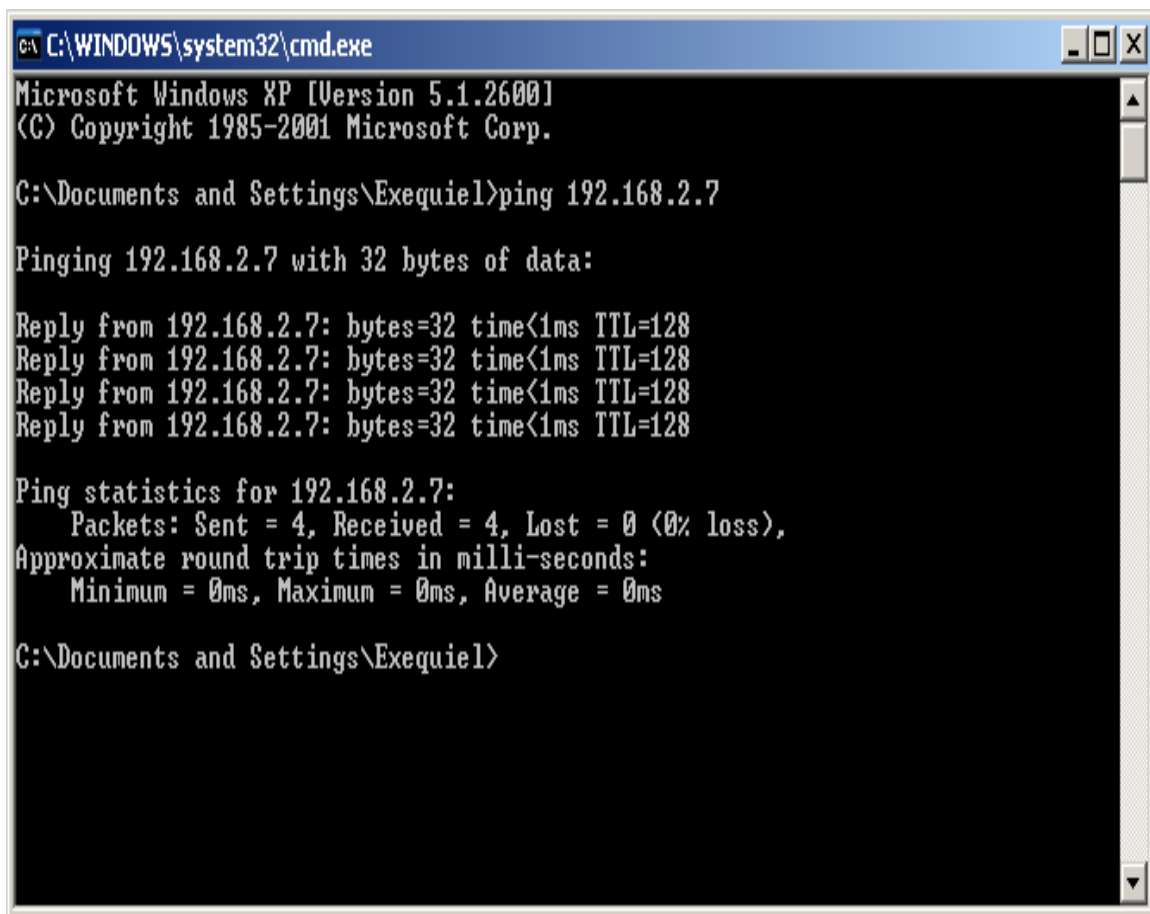
For direction connection from PC to Adapt9S12NE64 or neCore12M64, the cable must be crossover.

Link LED status:

Reset the Adapt9S12NE64 or neCore12M64 to initiate Link connections to PC. After a few seconds the link LED should come on. If it does not then recheck all connections and verify the cable type are correct for PC or HUB connections.

Ping:

Open a DOS prompt to Ping the target. On the DOS prompt type ***ping 192.168.2.7***



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Exequiel>ping 192.168.2.7

Pinging 192.168.2.7 with 32 bytes of data:

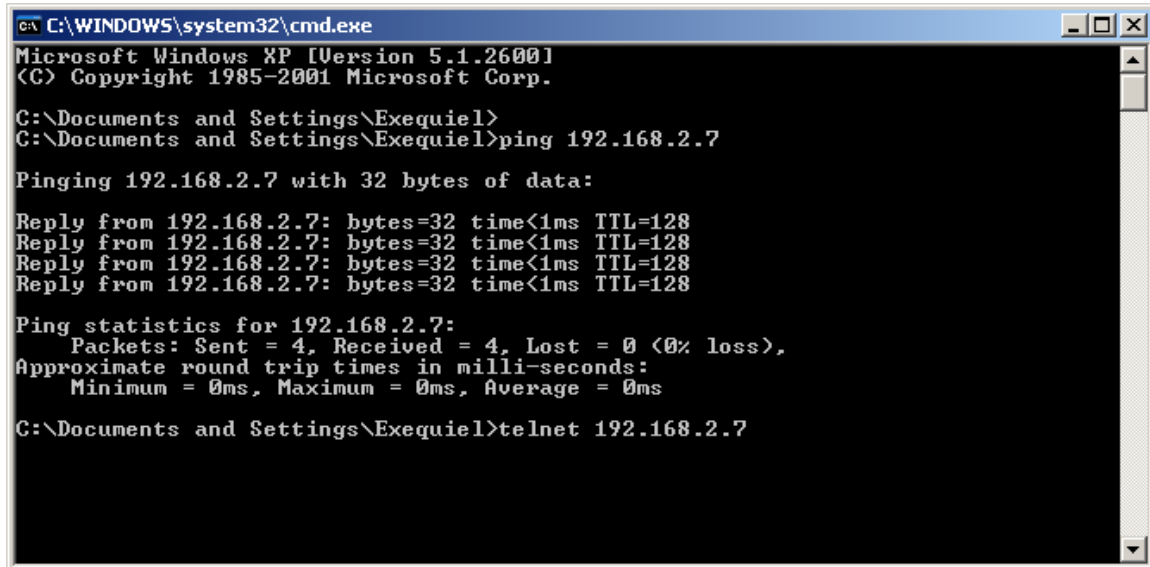
Reply from 192.168.2.7: bytes=32 time<1ms TTL=128
Reply from 192.168.2.7: bytes=32 time<1ms TTL=128
Reply from 192.168.2.7: bytes=32 time<1ms TTL=128
Reply from 192.168.2.7: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.2.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\Exequiel>
```

Telnet:

Open a DOS prompt to run Telnet application as shown. On the DOS prompt type **telnet 192.168.2.7**



```

C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Exequiel>
C:\Documents and Settings\Exequiel>ping 192.168.2.7

Pinging 192.168.2.7 with 32 bytes of data:

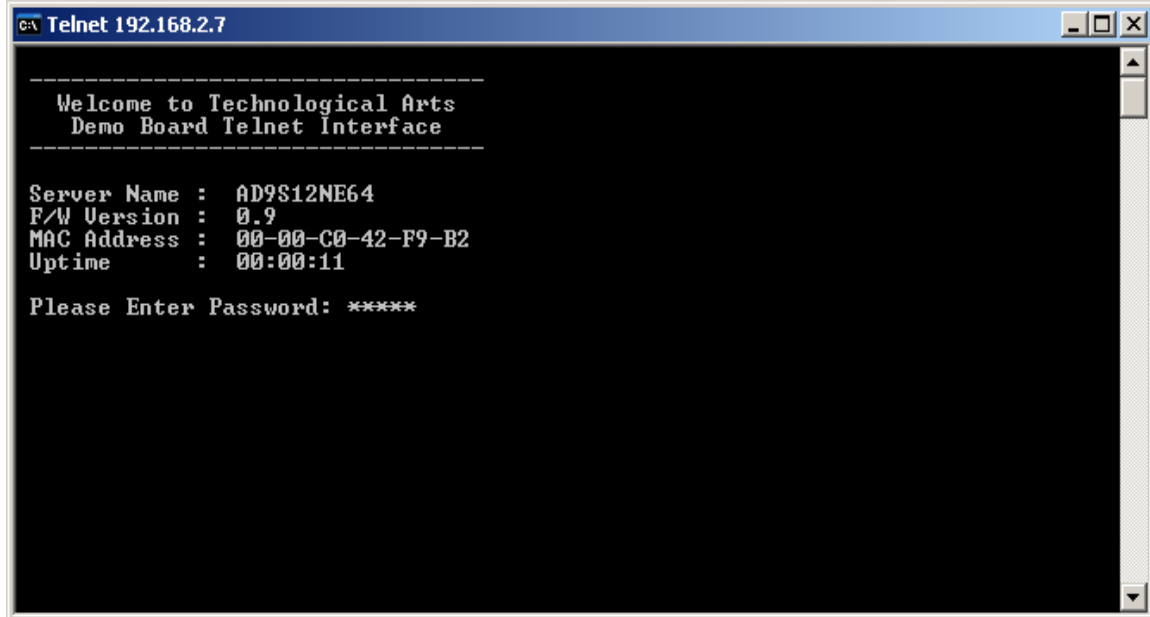
Reply from 192.168.2.7: bytes=32 time<1ms TTL=128
Reply from 192.168.2.7: bytes=32 time<1ms TTL=128
Reply from 192.168.2.7: bytes=32 time<1ms TTL=128
Reply from 192.168.2.7: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.2.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\Exequiel>telnet 192.168.2.7

```

It will ask for password. Enter the password as **hello** then press the CR key.



```

C:\ Telnet 192.168.2.7

-----
Welcome to Technological Arts
Demo Board Telnet Interface
-----

Server Name : AD9S12NE64
F/W Version : 0.9
MAC Address : 00-00-C0-42-F9-B2
Uptime : 00:00:11

Please Enter Password: *****

```

This concludes the GCC/EGNU with uBUG12. As with all things the challenges are always to better understand how these tools are to be used. This document shows the process of using GCC/EGNU to Flashing the MCU using uBUG12.