



LIFELINE:
H8S/2378 TFT- LCD Direct Drive
Rev 1.2 12/2/2009



Who is this Document Written for? Anyone who has received an H8S/2378 LCD Demo kit and wants to find all the latest documentation, compile the demo project and make sure their kit is fully updated.

Problem: The TFT-LCD Direct Drive Demo Kit for the H8S/2378 currently ships with an obsolete CD, obsolete firmware with old app notes and out of date compilers etc. The included documentation and CD is superseded by online documentation located by clicking on the red kit owners H8S/2378 link button @ www.americas.renesas.com/H8LCD/2378. Please use only the updated documentation. Once all the software has been updated, this kit makes an excellent demonstration platform.

Solution: This LifeLine document will walk you through setting up the H8S Demonstration platform hardware and software environment on any PC in ~ 45 minutes + install times. When you finish this document you will have compiled and installed the full Demo Software and be able to fully exercise the kit functionality. The process is explained in great detail, so that anyone can follow the instructions without trouble. You will likely be able to “blow through” the actual hardware setup and compiling and downloading the demo – but if you get stuck, you will have a step by step guide to make sure you can make it through the procedure.

Note: If you are using the LCD Kit for the H8S/2378 (part number **YLCDRSK2378**) before you begin a Hardware design it is important to be aware that this board has an obsolete schematic that should be used only after noting the annotations in the updated schematic. One of the primary reasons the schematic is obsolete centers around how the SRAM is connected to the micro. It will not allow 8 bit accesses and only allows 16 bit accesses. Regardless of the hardware limitations of the kit - it is an excellent software demonstration platform. An updated schematic can be found @ www.americas.renesas.com/H8LCD/2378

See Improvements or Problems with this Document? Email DirectDriveLCD@renesas.com

Step 1: Make sure you have the hardware you need:

Hardware:

- LCD Kit for the H8S/2378F** – with Kyocera or Sharp 320x240 QVGA LCD & 5V regulated Wall Transformer
- E10A Debugger** Note: While it is possible to configure everything using the RS232 connection – many PC's lack a serial port, and it takes ~7 minutes to update the flash or insert a software breakpoint with the RS232 and 15 seconds with the E10A. So we strongly suggest you use an E10A.
- **PC with XP or Vista** – 32 bit only

Step 2: Set up your Software – Go to www.americas.renesas.com/H8LCD/2378 for the links below:

Software:

-**HEW IDE** – if you have HEW installed on your system, make sure you run the autoupdater and get the latest version (Start -> Renesas -> High Performance Embedded Workbench -> Renesas Autoupdate). If you have not updated HEW – you may get a “cannot open workspace” error while opening the workspace. This will certainly happen if you install HEW using the obsolete CD contained in the kit. If you do **not** have HEW already installed on your system – install it by downloading the C/C++ compiler as per the next step:

-**C/C++ Compiler** for H8SX, H8S, H8 - Evaluation Software (currently Rev 7.00 – but we do not recommend you update beyond version 6.20) If you are currently using the C/C++ compiler and are using an older revision than 6.20, use the Renesas Autoupdater to update it to the current revision (Start -> Renesas -> High Performance Embedded Workbench -> Renesas Autoupdate).

To install the compiler if you don't have it installed:

- 1) Choose: Latest [C/C++ Compiler for H8/H8S/H8SX families](#) -> Enter your Renesas ID and Password
- 2) Agree to the Disclaimer
- 3) Download and Install

-E10A Drivers

- 1) Choose: [E10A Drivers, Latest](#) -> Enter your Renesas ID and Password
- 2) Agree to the Disclaimer
- 3) Download and Install

-**App Notes + Source Demo Project:** Direct Drive LCD Demo Application Note (REU05B0112-0201)

- 1) Choose: [Direct Drive Demo Code App Note](#) -> Enter your Renesas ID and Password
- 2) click <Download> and then Unzip to a temp directory
- 3) Under the Root of this directory will be REU05B0112 – H8S/H8SX Direct Drive LCD Demo App Note which is an in-depth look at how the Demo program is structured.
- 4) Copy the contents of an_reu05B0112_h8s_graphics\workspace\ to C:\workspace\
- 5) Under C:\workspace\DirectLCD_Demo\Documents will be:
 - a) Direct Drive LCD Design Guide – a hardware and software design reference.
 - b) GAPI Users Manual – a critical reference for all the GAPI software API calls.
 - c) Various Schematics for the various demo boards and LCD Panels that come with all the kits

-**Training:** Approximately 2 hours of in-depth training that covers the H8S/2378, setting up the hardware, compiling the demo – and exercising the core aspects of the Renesas Graphics API (GAPI).

- 1) Choose: [LabInstall](#) -> Enter your Renesas ID and Password
- 2) Agree to the Disclaimer
- 3) Download and Install the self extracting ZIP archive (the file will be DirectLCD_Labs.exe)
- 4) This file will create the Lab1, Lab2, Lab3 and Lab4 workspaces in your C:\workspace\directLCD\LabX directories. The course .pdf file will be located in the C:\workspace\directLCD\LabX root directory.

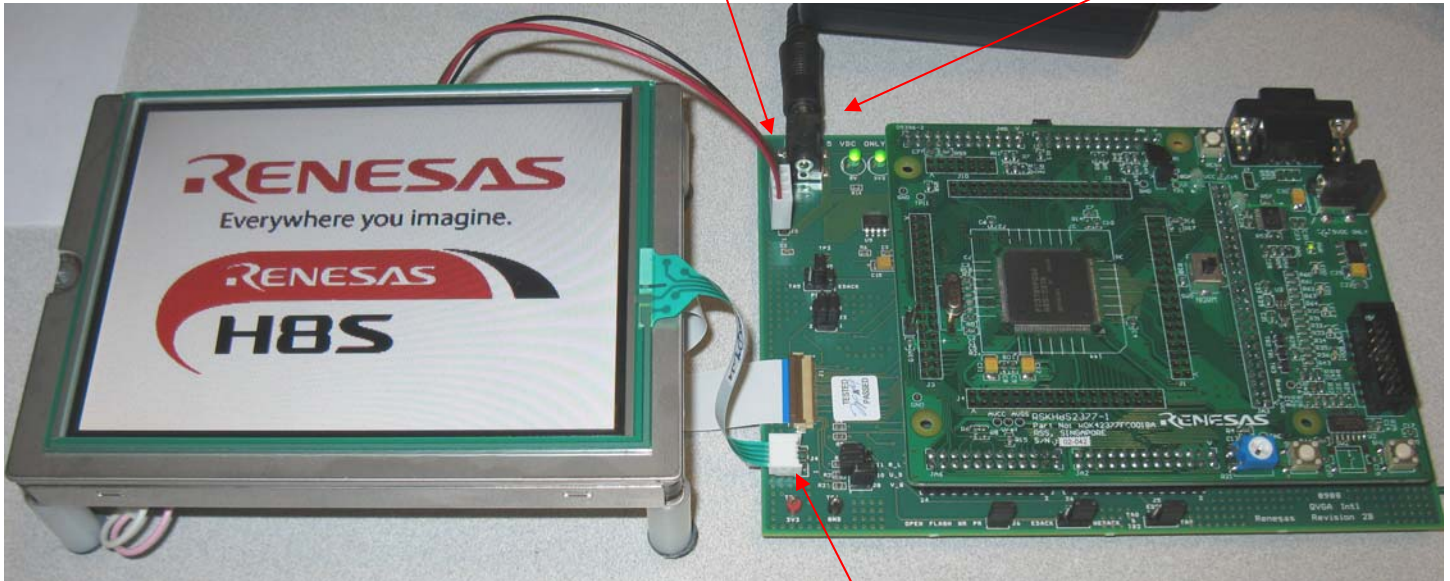
-**New Material Links:** - App Notes, Latest Schematics, Trainings and Latest News will be added to the www.americas.renesas.com/H8LCD/2378 page so use this page as a guide to the most current info.

Step 3: Set up the Hardware:

Follow the boxes in order to configure the hardware (Note – plug in the 5V supply (step 7) last).

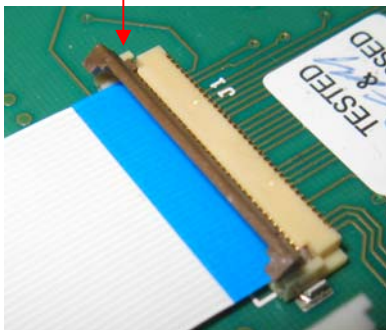
1) Connect Inverter Plug:
Missing wire to top

LAST STEP 7) Plug-in 5V Power Supply

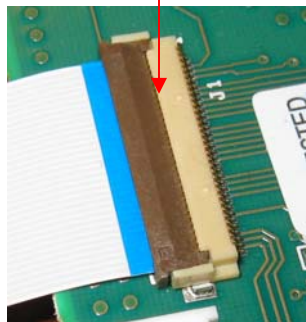


2) Insert Touch Panel connector, conductor side up

3A) Flip up lever

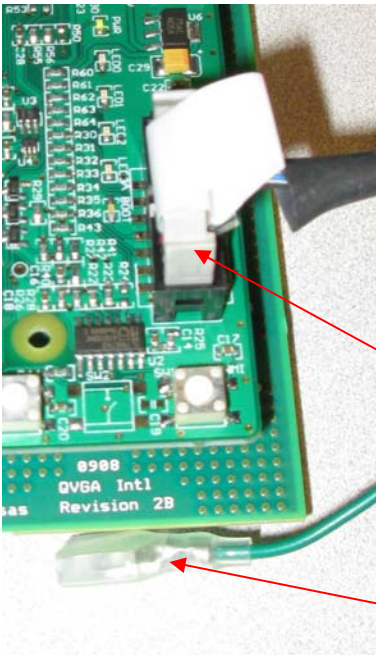


3B) Insert Cable – flip down lever, conductor side down



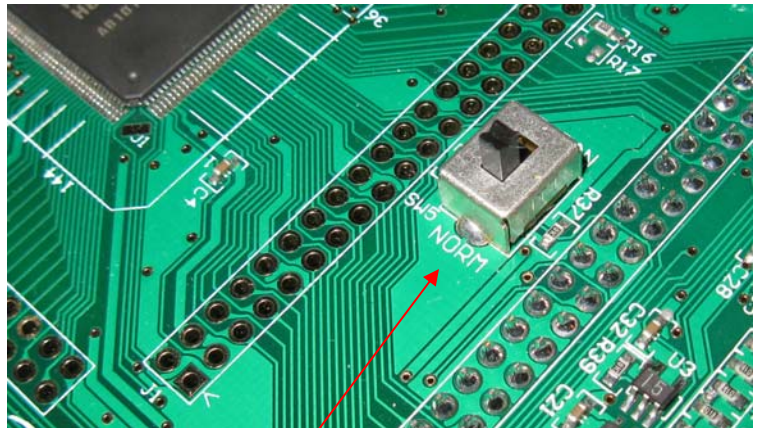
4) Plug in USB to PC and Mini USB to E10A



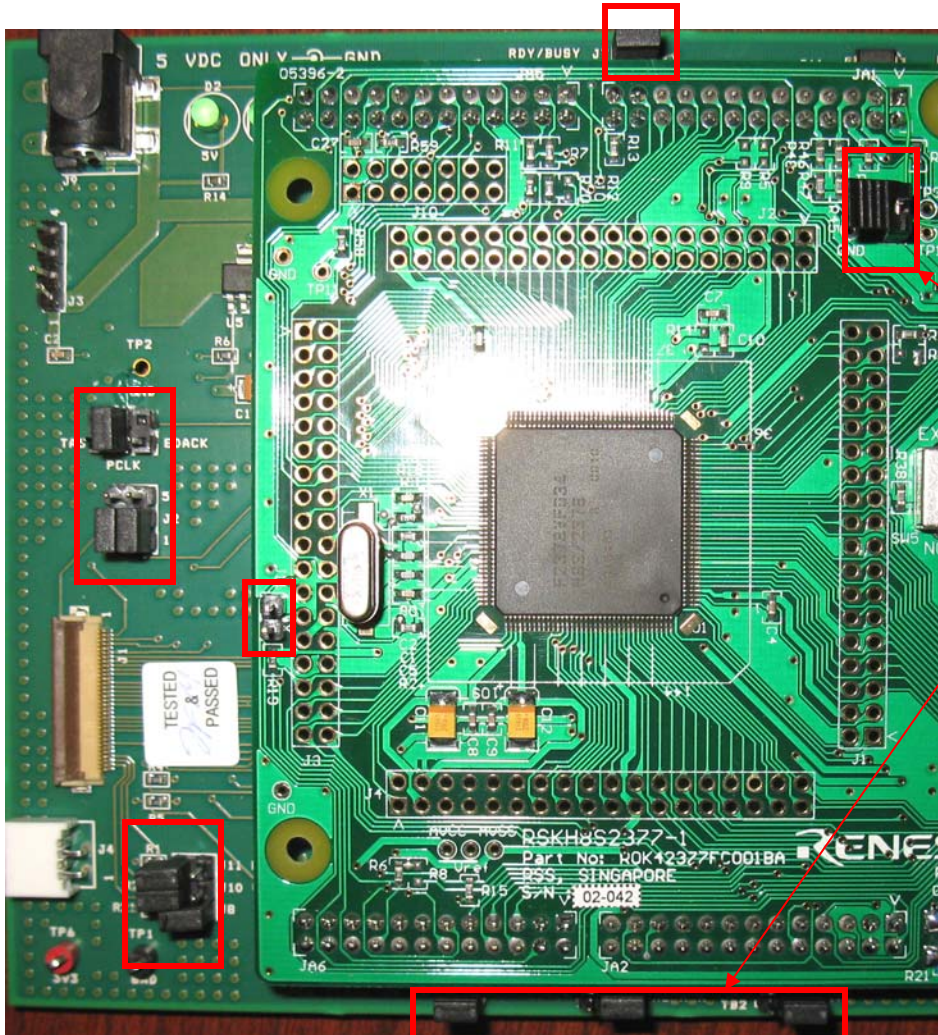


5) Connect E10A connector J5

No Need to Connect Aux Ground



6) Verify Switch SW5 set down to 'Norm'



Jumper Positions for Reference

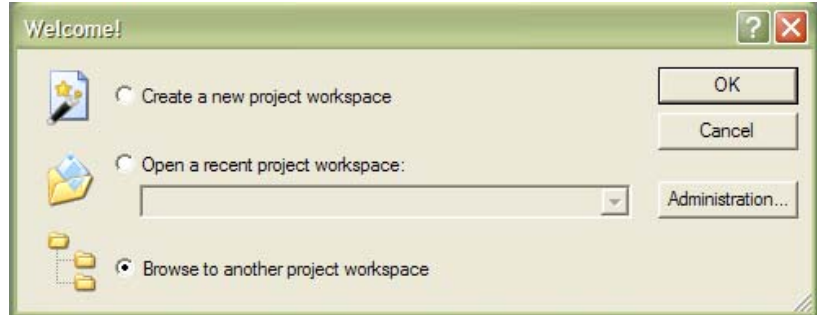
Note: Return to the previous page for Step 7

Lab1 – Section 2) Loading and Compiling the Project

1. Open HEW (High Performance Embedded Workshop) by double clicking the icon on the desktop OR under Start->Renesas->High Performance Embedded Workshop in the Renesas Program Group
2. On the welcome screen choose 'Browse to another project workspace', then click <OK>



Or if HEW is already open, go to File -> Open Workspace

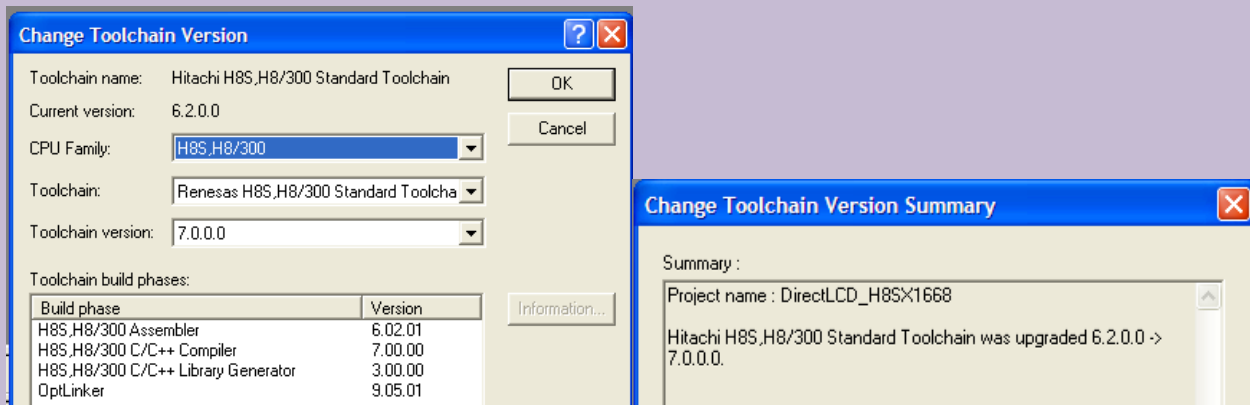


3. Browse to: C:\WorkSpace\DirectLCD_Demo\DirectLCD.hws and <Select>. The project manager window to the left will be populated.

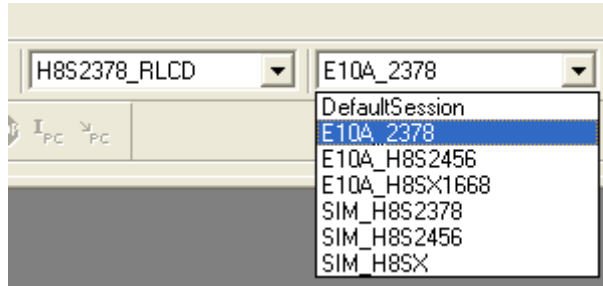
By Default – HEW will use workspaces under the C:\workspace\ directory on your PC – although it has the flexibility to use workspaces located anywhere on your machine.

If you are not using a preconfigured Renesas Laptop:

If the saved project does not match the compiler version that the project was created with (which is likely) – the project will be updated to the new version. Note that this conversion is one-way and you cannot go backwards to the old version. Click through the dialogs as necessary to complete the conversion.




4. Change the debug session (how HEW connects to the target) by clicking in the debug session pull down and selecting <E10A_2378> as shown below.

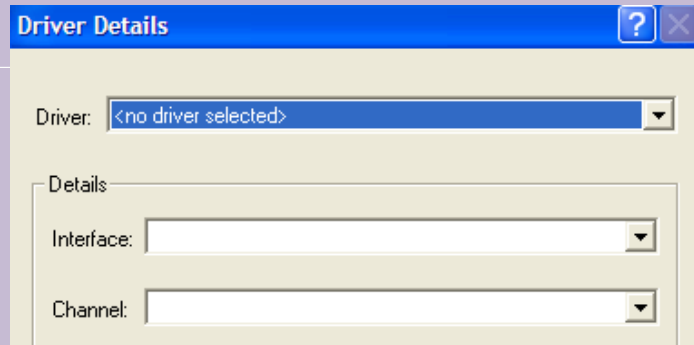


Note: The other session choices configure the project to connect to different Target Micros through an E10A or for debugging using the built in Simulator (which does not simulate an actual target LCD).

5. As detailed in section 1: **Setting up the Hardware** - Check that your demo board has power, and that the E10A is properly connected to the target board and a USB port of your PC.

6. Click the CONNECT icon  which will connect your PC to the E10A debugger as well as your target micro.

If you see a screen like the following:

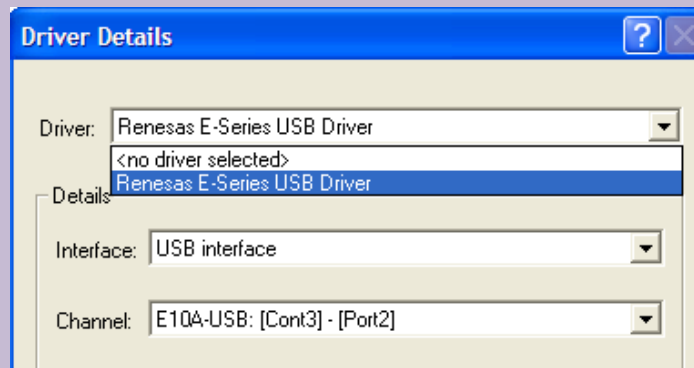


Driver: <no driver selected>

Details:

Interface:

Channel:

Driver: Renesas E-Series USB Driver

Details:

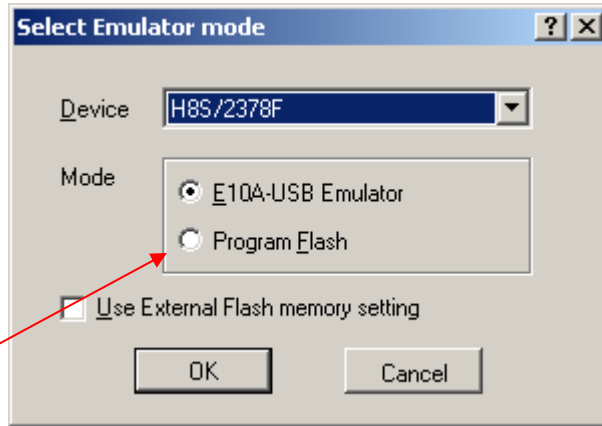
Interface: USB interface

Channel: E10A-USB: [Cont3] - [Port2]

Attempt to select 'Renesas E-Series USB Driver' from the 'Driver' pull down menu. If you are not able to select the E10A (Renesas E-Series USB Driver) from the driver pull down menu - you will need install the E10A drivers on your system. The drivers are available by going to www.renesas.com -> Dev Tool Tab -> Emulation and Debugging -> On-Chip Debuggers (E10A-USB) -> Click on link Labeled E10A-USB -> Downloads -> Pick E10A-USB Emulator – look for version for H8S in the list -> Enter Renesas ID and Password, agree to the disclaimer, download and install.

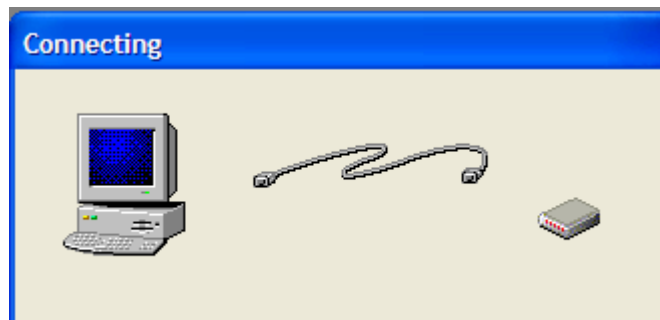
After you make sure you have installed the E10A drivers and selecting the Renesas E-Series USB Driver does not allow you to connect, you may find that unplugging and re-plugging the USB cable – or actually moving the USB cable to a different port on your machine may allow the Emulator to see the Driver. You may also reach a mode where the only solution is to close HEW and restart and reconnect to the emulator.

7. You will see the following Dialog box. Make sure your target (in this lab the H8S/2378F) is selected as the device and the settings are as shown, then click <OK>:

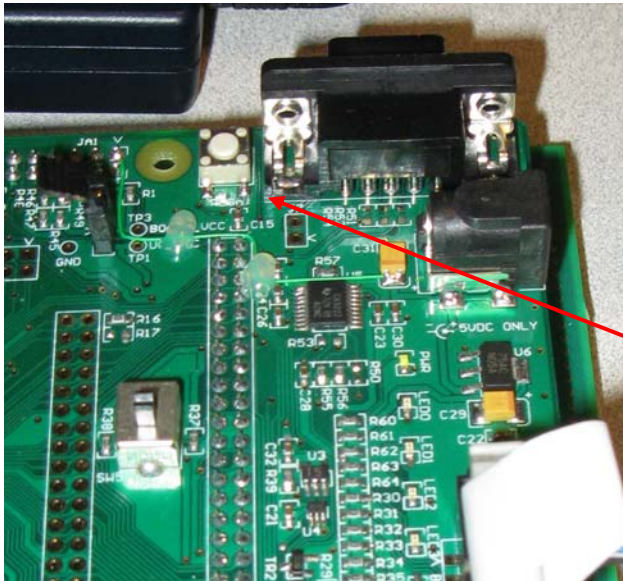


Note: The Program Flash Option allows you to program the micro's flash, however once finished, HEW will not be able to connect to the target through the debugger. Typically, you would use this option to test your final code.

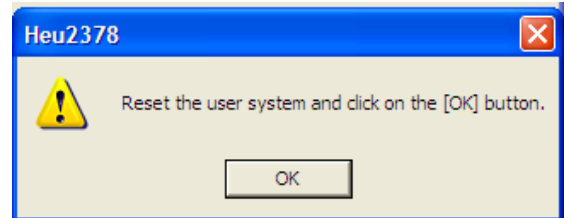
8. You will briefly see the following window as the PC connects to the E10A debugger. You may also see the message "loading new firmware."



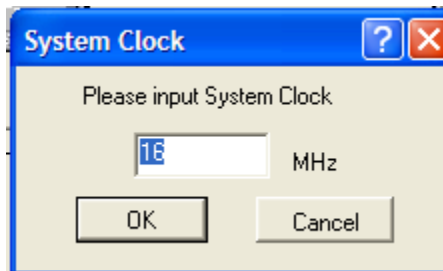
9. When prompted, press the Reset Switch on the board, then click <OK>. **Note:** this is located at the upper right of the demo board next to the RS232 connector and should **not** be confused with the BOOT switch on the lower right corner of the board.



Reset Switch

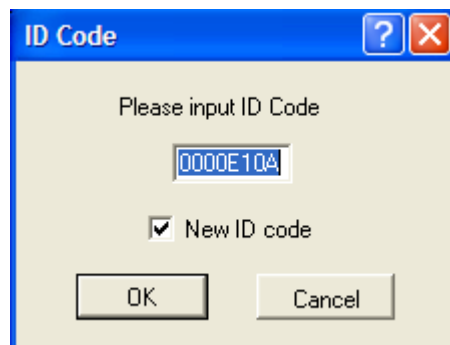


10. Enter the System Clock – which for the H8S/2378F demo needs to be set to 16 mhz (the board crystal frequency):




Note: This allows the emulator to synch up to the target for communications

11. Input your ID Code which for the training is 0000E10A:

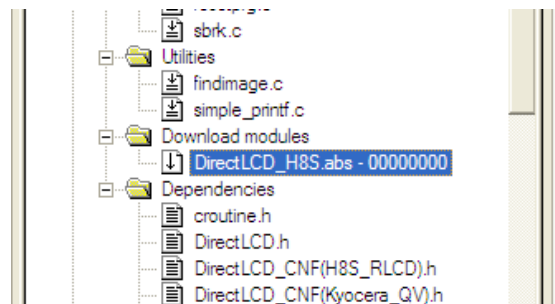


Note: This code allows you to secure access to the flash. Anyone trying to connect to this micro must provide this code or erase all flash before they can connect.

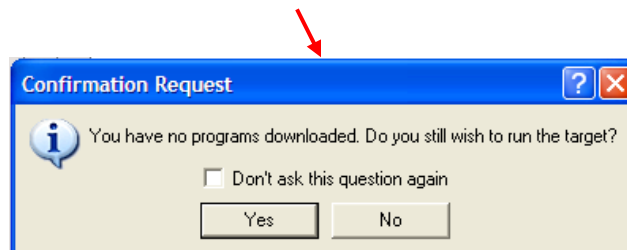
12. Click the BUILD ALL icon . This may take up to 3 minutes the first time. Look for status text in the build window at the bottom of the screen.


 Your code should build with No Errors. If you receive an L1500 Stack Warning or an L1200 Warning, please ignore.

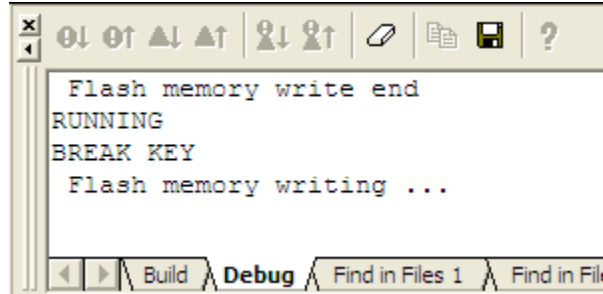
13. Your compiled code must be downloaded into the target. To do this, locate the download module in the workspace window (ends in .abs) and double click on it. **Note:** When you see an empty box to the left of the file name, it has not been downloaded to the target. A box with an arrow in it signifies it has been downloaded. This step may be done automatically depending on your project settings.



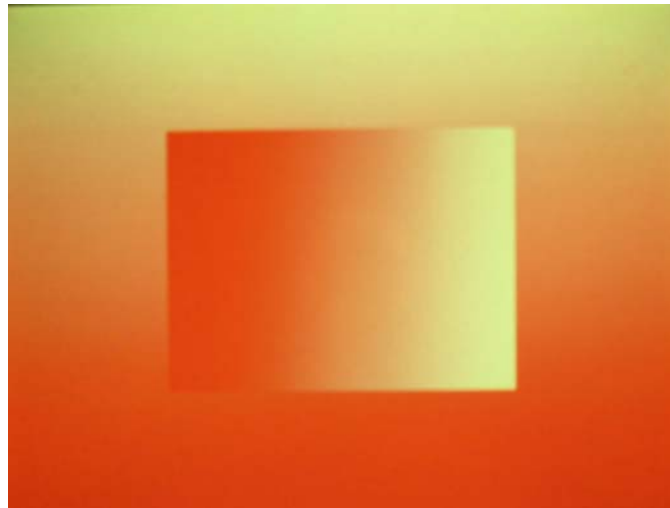
Note: You will receive this dialog box if you attempt to run the micro with no code loaded.



14. Click on the RESET GO icon  to execute the code – but be aware that there will be up to a 10 second delay while the code is downloaded into the target, during which the target LCD screen will remain blank. You will see the following information in the Debug window while the Flash is being downloaded:



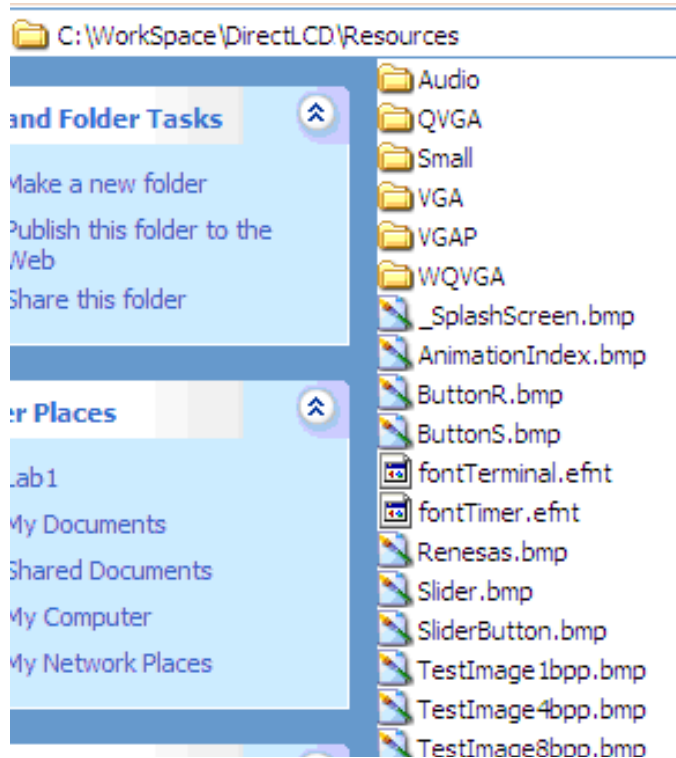
15. You should then see the default background below:



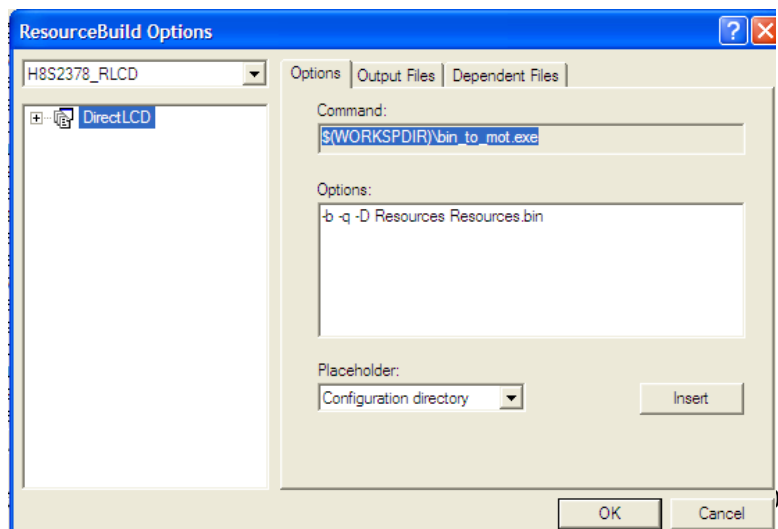
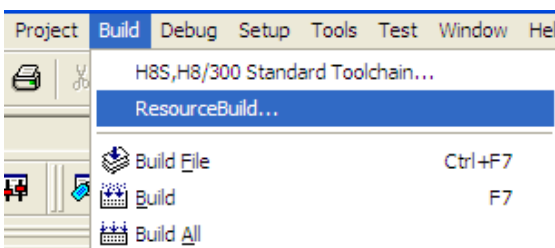
16. Open an Explorer window to the directory C:\WorkSpace\DirectLCD_Demo\Resources



17. Click the STOP icon  to stop the processor.

- Open the C:\Workspace\DirectLCD\Resources\QVGA folder and copy the contents to the \Resources folder. You must open the \QVGA folder and copy the files into the \Resources directory before they can be compiled within HEW. **Note:** 5 job directories contain images sized for 5 different screen resolutions and the 6th job directory contains sound files. Since the H8S/2378 RSK does not support sound – we ignore the Audio directory. The LCD that comes with the H8S/2378 RSK is Quarter VGA resolution (320x240 pixels) so the files must be copied from the \QVGA directory in order for the software to use correctly sized graphic images for the QVGA resolution screen.



To better understand how Graphic images and sound files imported into the HEW environment: The way the resources (bitmap images, sounds etc.) are compiled, a DOS command line program *bin_to_mot.exe* is called during the Build All process which takes all the files in the \Resources directory and compiles them down to a single file (Resources.bin) which is then linked into the Project – and finally downloaded into Micro Memory. How is this done in HEW? Go to Build -> ResourceBuild... to see the way the *bin_to_mot.exe* file is called during a Build All. If you moved to a different sized target LCD, one of the first things you would do would be to copy resource files from one of the other directories.



18. Click the BUILD ALL icon  to rebuild the new \Resources. BUILD ALL rather than a simple BUILD is necessary in order to regenerate the Resources.bin file that contains the graphic and sound files. Any time the external resources change (ie. you add a new picture) a BUILD ALL must be run to link the new graphic or sound files into your project.
19. Click the RESET GO icon  to RUN the code. Don't forget – the Flash memory write takes ~10 seconds. Below is what you should see on your Target LCD.

