What Are The ShieldBuddy TC375 Tools?

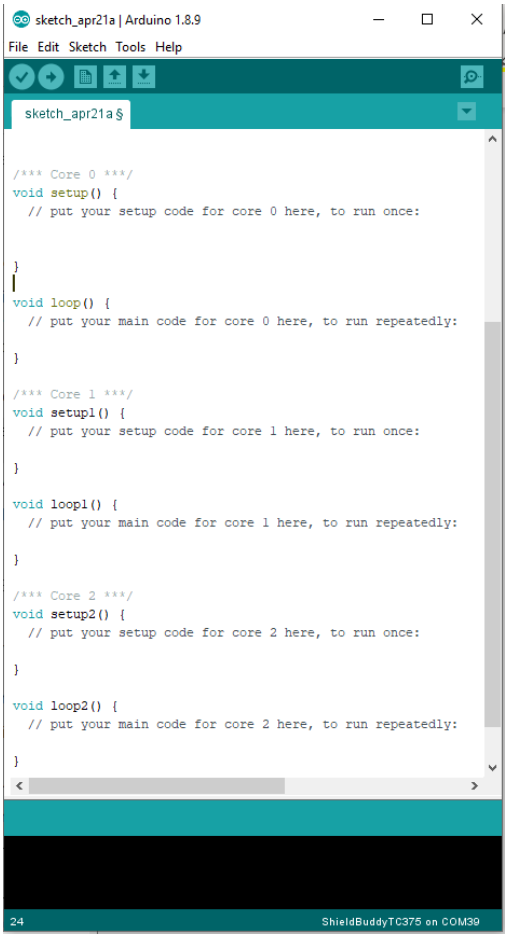
The main ShieldBuddy toolchain is the Eclipse-based “FreeEntryToolchain” from Hightec/PLS/ Infineon. This is a full C/C++ development environment with source-level debugger. The familiar Arduino IDE is also available for the ShieldBuddy. Both IDEs are based on the Infineon iLLD libraries and allow the usual Arduino C++- like Processing language to be used with the familiar Arduino IO functions e.g. digitalWrite(), analogRead(), Serial.print() etc.. These functions are implemented for all three TC375 cores and can be used without restriction.

Given the awesome power of the TC375 we expect most users to program it in C in Eclipse, using the iLLD API directly or working with the underlying SFRs. The neat thing about the ShieldBuddy is that it lets you access the massive power of the TC375 without knowing anything about the bits and bytes of the peripherals!

Getting Started With The TC375 Toolchain

If you have never used an Arduino-style board before then is a good idea to have a look at www.arduino.cc to find out what it is all about! Although the ShieldBuddy contains three powerful 32-bit, 300MHz processors, it can be used in exactly the same way as an ordinary Arduino Uno.

The same Arduino IDE can be used but with an add-on to allow triple core operation. To use the ShieldBuddy you will need:



(i) a PC with Windows 7 or later

(ii) The Aurix free toolchain with Eclipse, C/C++ compiler and UDE debugger from PLS:

http://free-entry-toolchain.hightec-rt.com/

Follow the instructions given as you will need a free licence file which will be automatically emailed to you. You will need to copy it to : C:\HIGHTEC\licenses.

(iii) The standard Arduino IDE installed from:
https://www.arduino.cc/en/Main/Software

You may already have this but make sure it is installed in the default directory!

(iv) The Arduino development environment add-in for Eclipse and the standard Arduino IDE:

http://www.hitex.co.uk/fileadmin/uk-files/downloads/ShieldBuddy/ShieldBuddyTC375IDE.zip

Unzip this to a temporary directory using the zip password “ShieldBuddy”. Run the installer and use the password “ShieldBuddy” to copy the IDE onto your PC.

Run the installer and use the password “ShieldBuddy” to copy the IDE onto your PC. Install these in the order Arduino IDE (you may already have this), Aurix freetoolchain, ShieldBuddy IDE.

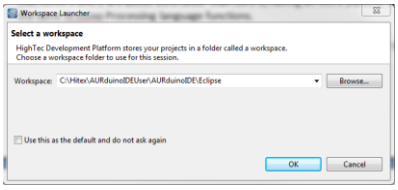
Using The ShieldBuddy TC375

Once all of the above packages have been installed, use the ShieldBuddy just like any other Arduino except that you have three processors to play with rather than just one. Processor core 0 will run setup() and loop() with processor cores 1 and 2 running setup1()/setup2() and loop1()/loop2(). There are no special measures required to write triple-core programs but make sure that that you do not try to use the same peripheral with two different cores at the same time. Whilst nothing nasty will happen, your programs will probably just not work properly! Each core is basically identical except that cores 1 and 2 are about 20% faster than core 0, having an extra pipeline stage. They all can use the same Arduino Processing language functions. When choosing which ShieldBuddy to use in the Arduino IDE choose “ShieldBuddy TC375”.

NOTE: If you have worked with normal Arduinos, you may be used to your programs automatically running as soon as they have downloaded. In the case of the ShieldBuddy, following download, you have to press the Reset button to launch the new program. (The program will run automatically in the future when power is applied to the system.)

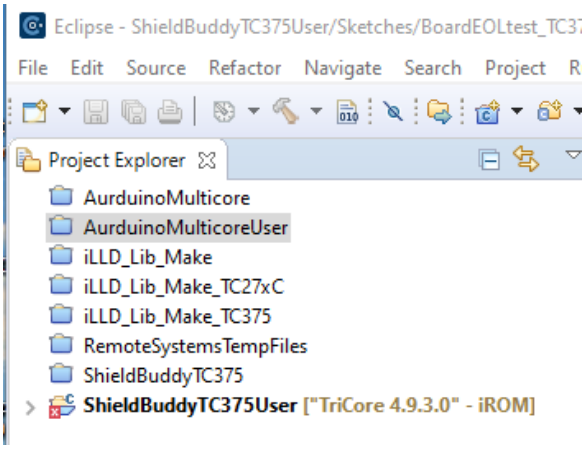
Using The Eclipse IDE

If you want to use the Eclipse environment, start the toolchain with the icon. When prompted, open the workspace at:



C:\Hitex\AURDuinoIDE\Eclipse

The default project is ShieldBuddyTC375User:



Arduino-style sketches are stored in the Sketches directory. The default sketch “BoardEOLtest_TC375.cpp” is a simple program that uses all three cores. You can overwrite the statements we used with your own. Other useful sketches are stored in the “unused” subdirectory.

To get your programs into the ShieldBuddy, use the PLS UDE debugger in its standalone mode.

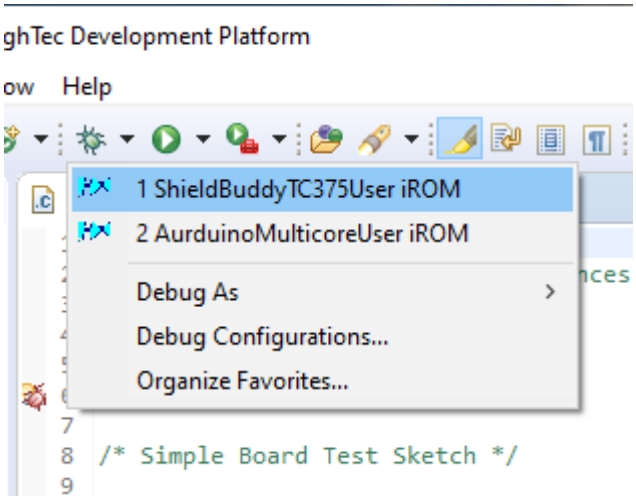
Open the workspace (ShieldBuddy with TC375 processor):

“C:\Hitex\AURduinoIDE\Eclipse\ ShieldBuddyTC375User \.ude\ShieldBuddyWorkspace_37xA.wsx”

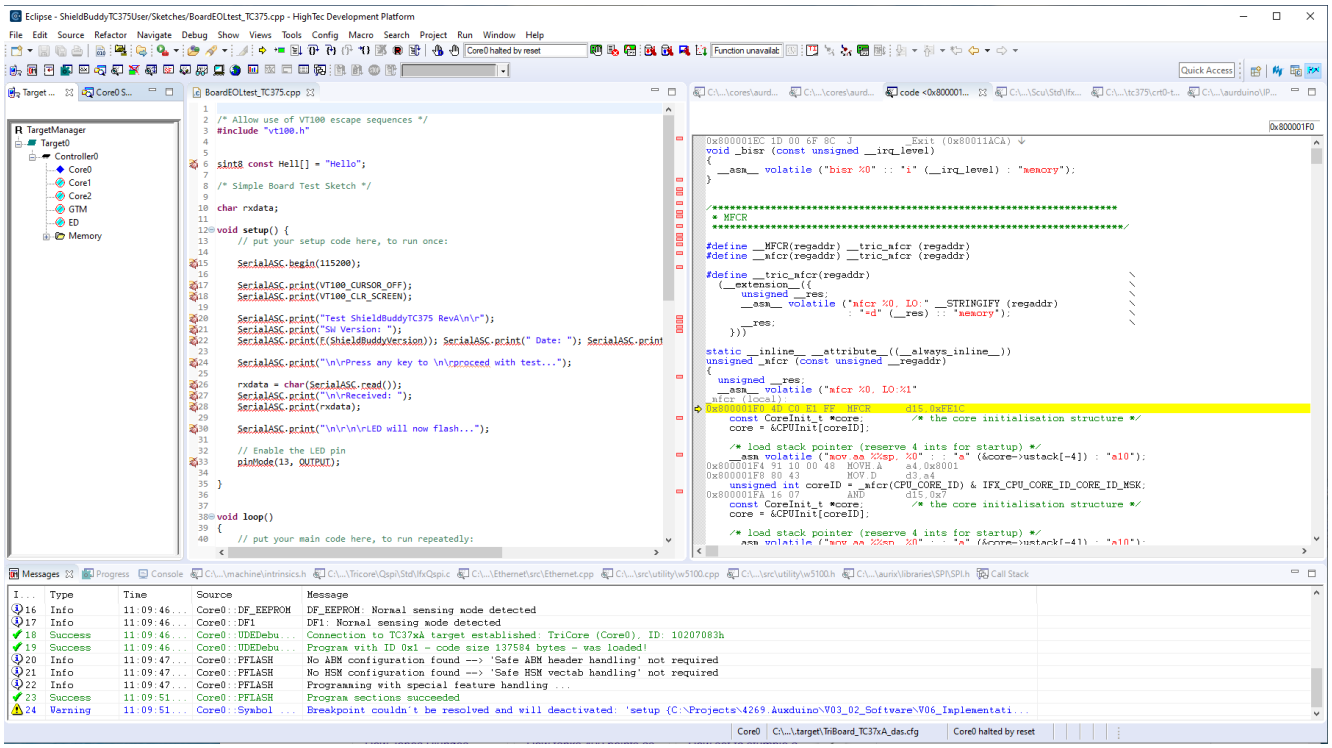
The program will automatically load. You can run it by clicking the icon and stop it with the icon. To reset the program, use the icon. You can find more information on using the Eclipse tools and the PLS UDE debugger in the guide supplied with the FreeToolChain.

Debugging Programs Using Eclipse PLS UDE Debug Perspective

To debug programs in the UDE debugger, an Eclipse perspective is provided as an alternative to using it as a standalone debugger.. Debugging is started by clicking on the debug icon and then selecting “ShieldBuddy TC375 User iROM”. Make sure that the ShieldBuddy is connected to the USB port on your PC first.



You can now use the UDE debug perspective in the usual; Eclipse manner.



Getting Help

If you need help, there is a new on-line forum at http://ShieldBuddy.boards.net/.
This hardware user manual with the pinouts is at http://www.hitex.co.uk/index.php?id=3650.