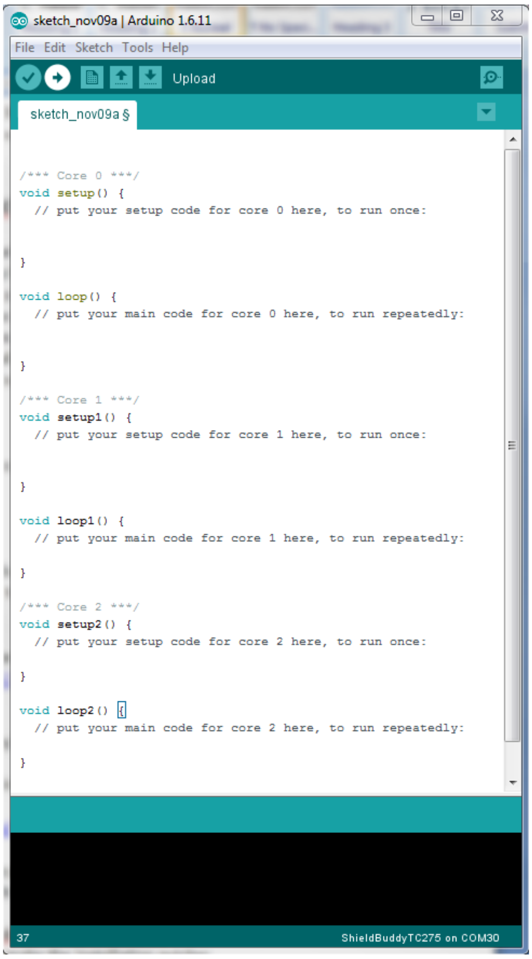
What Are The ShieldBuddy TC275 Tools?

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 funcitions e.g. digitalWrite(), analogRead(), Serial.print() etc.. These functions are implemented for all three TC275 cores and can be used without restriction.

Given the awesome power of the TC275 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 TC275 without knowing anything about the bits and bytes of the peripherals!

Getting Started With The TC275 Toolchain


sketch_nov09a | Arduino 1.6.11
File Edit Sketch Tools Help
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sketch_nov09a §
37
ShieldBuddyTC275 on COM30

```
/*** Core 0 ***/
void setup() {
  // put your setup code for core 0 here, to run once:


}

void loop() {
  // put your main code for core 0 here, to run repeatedly:


}

/*** Core 1 ***/
void setup1() {
  // put your setup code for core 1 here, to run once:


}

void loop1() {
  // put your main code for core 1 here, to run repeatedly:

}

/*** Core 2 ***/
void setup2() {
  // put your setup code for core 2 here, to run once:

}

void loop2() {
  // put your main code for core 2 here, to run repeatedly:

}
```

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, 200MHz 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 Vista 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 1.8.0 Arduino IDE installed from:
http://arduino.cc/download.php?f=/arduino-1.8.0-windows.exe

Make sure you install this in the default directory! If you do not have admin rights on your PC then use this version:
https://downloads.arduino.cc/arduino-1.8.0-windows.zip

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

http://www.hitex.co.uk/fileadmin/uk-files/downloads/ShieldBuddy/ShieldBuddyMulticoreIDE.zip
Unzip this to a temporary directory using the zip password “ShieldBuddy”. You can also download the installer directly from:
http://www.hitex.co.uk/fileadmin/uk-files/downloads/ShieldBuddy/ShieldBuddyMulticoreIDE.exe

Run the installer and use the password “ShieldBuddy” to copy the IDE onto your PC. Install these in the order Aurix freetoolchain, Arduino IDE, ShieldBuddy IDE.
ShieldBuddy COMports: You may find that the Arduino IDE thinks that the ShieldBuddy has two comports. If this happens, please choose the one with the higher number!

Using The ShieldBuddy TC275

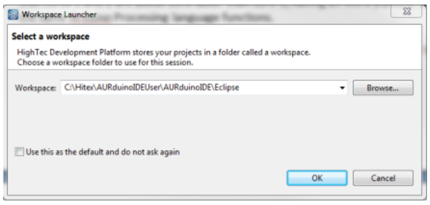
Once all of the above packages have been installed, use the ShieldBuddy just like any other Arduino except that you have three processors to play with rather than just one. Processor core 0 will run setup() and loop() with processor cores 1 and 2 running setup1()/setup2() and loop1()/loop2(). There are 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, if you have a board with a CA-step processor (SAK-TC275TP-64 F200W CA EES A), choose “ShieldBuddy TC275”. If you have a DC-step board (SAK-TC275TP-64 F200N DC), choose “ShieldBuddy TC275_Dx”.

Remember to press the reset button on the ShieldBuddy to make it run the new program.

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


Workspace Launcher

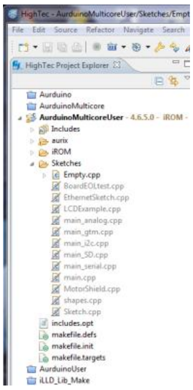
Select a workspace

HighTec Development Platform stores your projects in a folder called a workspace.
Choose a workspace folder to use for this session.

Workspace: C:\Hitex\AURduinoIDEUser\AURduinoIDE\Eclipse

☐ Use this as the default and do not ask again

The default project is AURduinoMulticoreUser:


HighTec - AurduinoMulticoreUser/Sketches/Empt

HighTec Project Explorer

```
Aurduino
AurduinoMulticore
AurduinoMulticoreUser - 4.6.5.0 - iROM -
  Includes
  aurix
  iROM
  Sketches
    Empty.cpp
    BoardEOLtest.cpp
    EthernetSketch.cpp
    LCDExample.cpp
    main_analog.cpp
    main_gtm.cpp
    main_i2c.cpp
    main_SD.cpp
    main_serial.cpp
    main.cpp
    MotorShield.cpp
    shapes.cpp
    Sketch.cpp
  includes.opt
  makefile.defs
  makefile.init
  makefile.targets
AurduinoUser
iLLD_Lib_Make
```

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

To get your programs into the ShieldBuddy, use the PLS UDE debugger

Open the workspace (ShieldBuddy with TC275 DC step processor):
“C:\Hitex\AURduinoIDE\Eclipse\AurduinoMulticoreUser\.ude\ShieldBuddyWorkspace_27xD.wsx”

Or (ShieldBuddy with TC275 CA step processor) :
“C:\Hitex\AURduinoIDE\Eclipse\AurduinoMulticoreUser\.ude\ShieldBuddyWorkspace_27xC.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.

Getting Help

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