Arduino Look and Feel for Multicore
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... of Complexity and Ease of Use
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The Bridegroom

Profile

Age: 20+
Size: 2 – many
Weight: lightweight but powerful
Hobbies: not really
Profession: Executor
Favorite food: LOC
Parents: IBM, TI, …
Hometown: embedded systems and computer
Why Multicore?

- Performance
- Integration
- Safety

Multicore

- Time To Market
- Size, Weight
- Power
Multicore Benefits

- Minimal latency
- Operational speed
- Less board space

$$$$
Multicore Challenges

- Migration
- Mapping
- Protection
- Testing
Profile

Age: 11
Size: 68.6 mm x 53.4 mm
Weight: Millions of …
Hobbies: Robotic, Home automation, …
Profession: Teacher
Favorite food: LOC
Parents: Massimo Banzi, David Cuartielles, Tom Igoe, Gianluca Martino, David Mellis
Hometown: Ivrea (Italy)
Brief in History

2001
- Processing

2004
- Wiring

2005
- Arduino

2008
- Arduino LLC

2015
- Genuino
Multicore and Arduino

Intel Edison Kit for Arduino

Arduissimo

UDOO Neo

Ref. Intel

Ref. INDIEGOGO

Ref. UDOO
Low cost AURIX TC275 board for professional and hobby use
Uses Arduino™ Due/Mega2560 form factor and IO connector pin allocation

Safety Hitex Shield BuddyTC275 option with on-board CIC61508 safety monitor for use with SafeTlib

Instant access to over 317 shields

Supplied with basic drivers for
DS-ADC, SAR, GTM, GPT,
CCU6, ASC, LIN, SPI, QSPI, Ethernet

Direct USB debug interface

Development tools based on HighTec Free Aurix Toolchain and Arduino IDE

USB or 9-12V power supply
Connect
Download/Install
Start the IDE
Look and Feel

Toolbar Buttons
(Verify, Upload, New, Open, Save, Serial Monitor)

Message Box

Console

Sketch

Hardware Info
/// Core 0

void setup() {
    // initialize digital pin LED_BUILTIN as an output.
    pinMode(LED_BUILTIN, OUTPUT);
}

void loop() {
    // put your main code for core 0 here, to run repeatedly:
    digitalWrite(LED_BUILTIN, HIGH); // turn the LED on (HIGH is the voltage level)
    delay(1000); // wait for a second
    digitalWrite(LED_BUILTIN, LOW);  // turn the LED off by making the voltage LOW
    delay(1000); // wait for a second
}

/// Core 1

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

void loop1() {
    // put your main code 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 core 2 here, to run repeatedly:
}
Having an Affair

```cpp
/* Allow use of VT100 escape sequences */
#include "vt100.h"

/* Simple Board Test Sketch */

char rxdata;

void setup() { 
  // put your setup code here, to run once:
  SerialASC.begin(9600); 
  SerialASC.print(VT100_CURSOR_OFF);
  SerialASC.print(VT100_CLR_SCREEN);
  SerialASC.print("Test AURduino RevB");
  SerialASC.print("\n\rPress any key to \n\rproceed with te \n\r\n\rReceived: ");
  SerialASC.print(rxdata);
  rxdata = char(SerialASC.read());
  SerialASC.print("\n\rReceived: ");
  SerialASC.print(rxdata); 
```
Initialization of the configuration structure

```
Creature Prefix>_<initConfig(Creature Prefix>_{Config *cfg);
```

Driver Initialization

```
Creature Prefix>_<init(Creature Prefix>_{Handle *handle, Creature Prefix>_{Config *cfg);
```

Driver De-Initialization

```
Creature Prefix>_<deInit(Creature Prefix>_{Handle *handle);
```

iLLD functional APIs

```
Creature Prefix>_<functionality>(Creature Prefix>_{Handle *handle);
```
Can Arduino help to get started quickly on Multicore?

Do Arduino style boards provide a cost-effective platform?

Is it an intuitive way to program?

Does Arduino help to maintain complex Multicore scenarios?

Does it provide means to deeply debug your system?

Will your functional safety application benefit from Arduino?
MicroConsult
Training & Coaching
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