



# Atmosfire Module

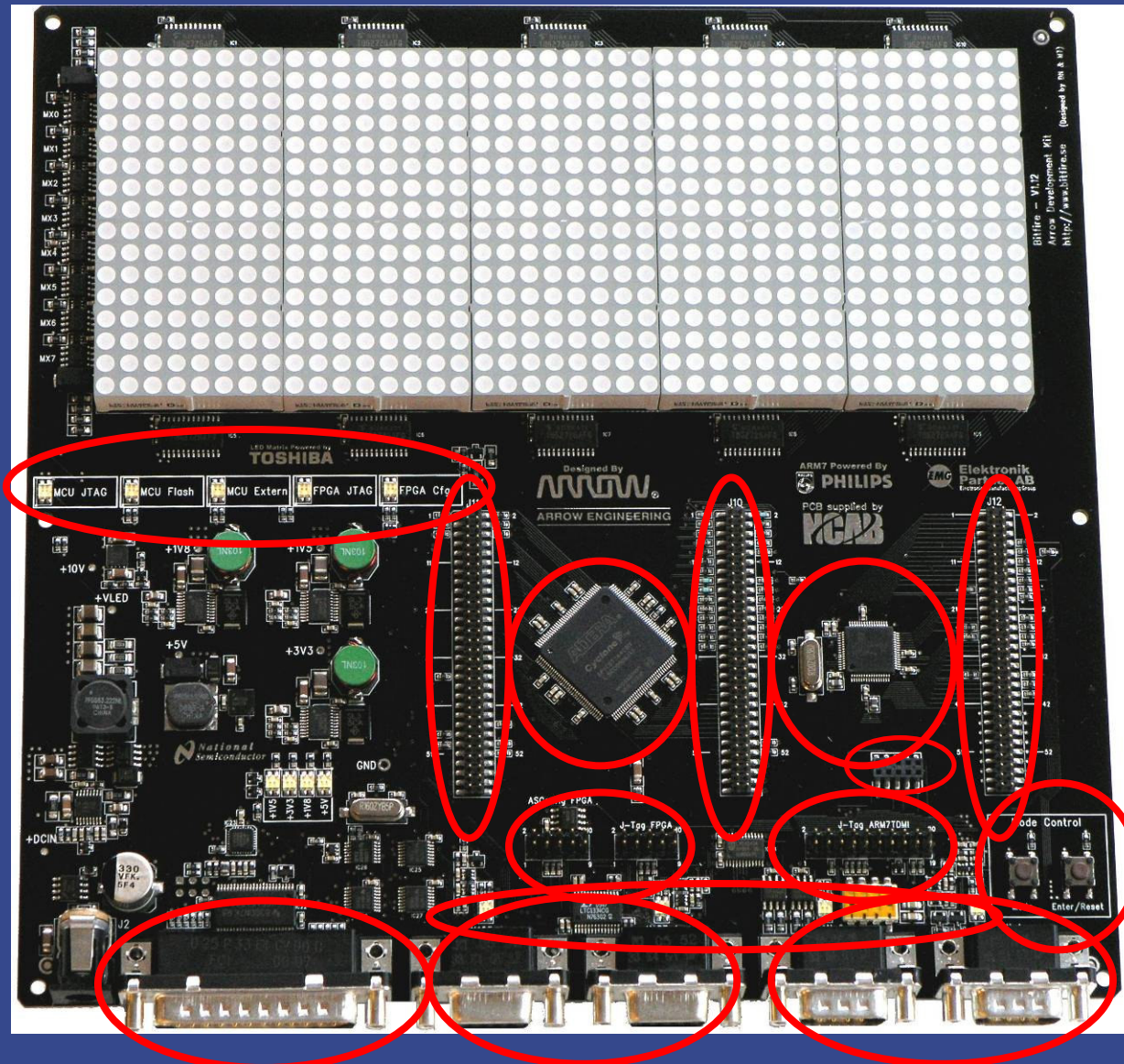
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Workshops May 2007, Stockholm

2007-05-21

Powering the Supply Chain.<sup>SM</sup>

# Bitfire Overview

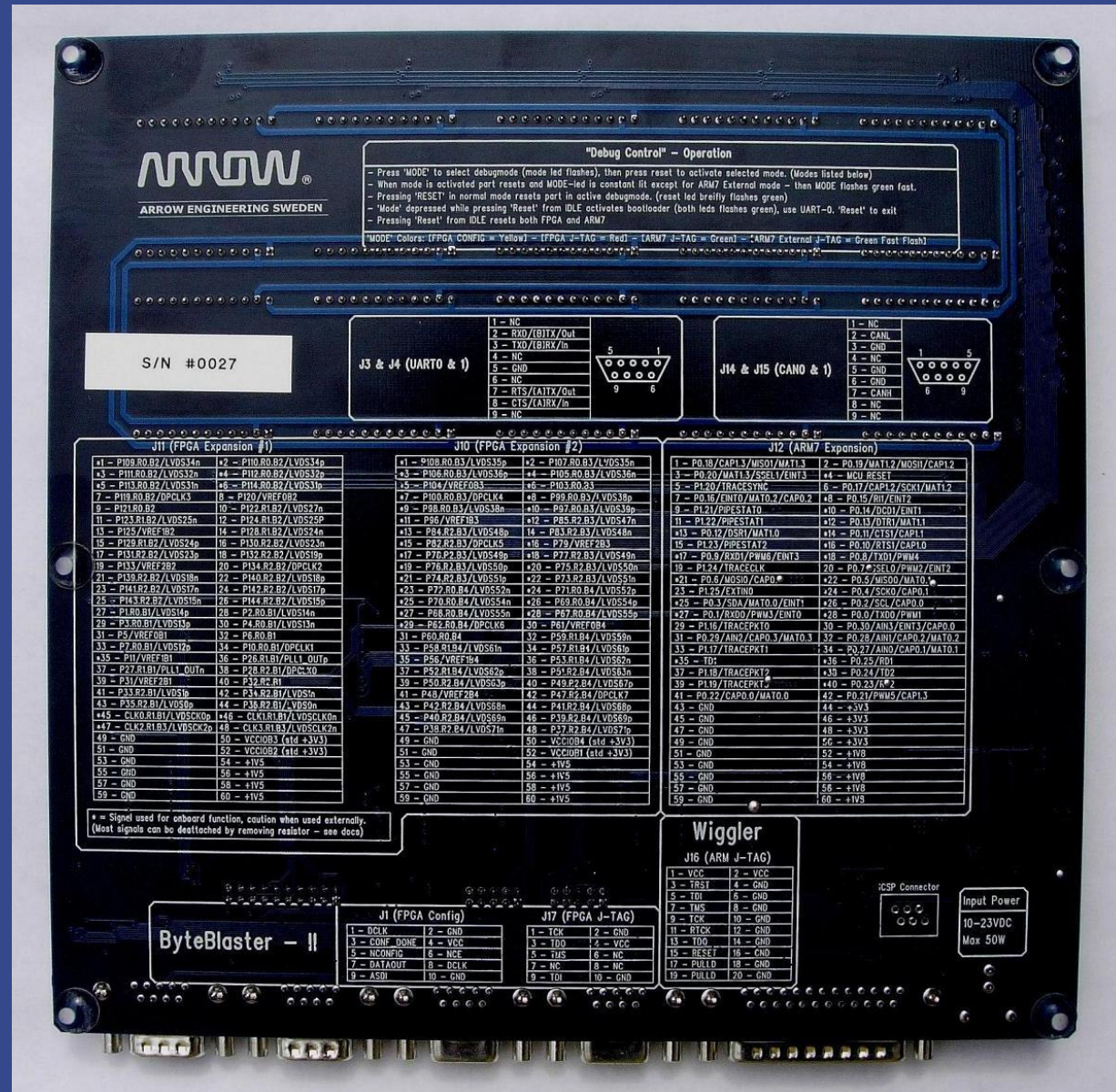


Powering the Supply Chain.<sup>SM</sup>





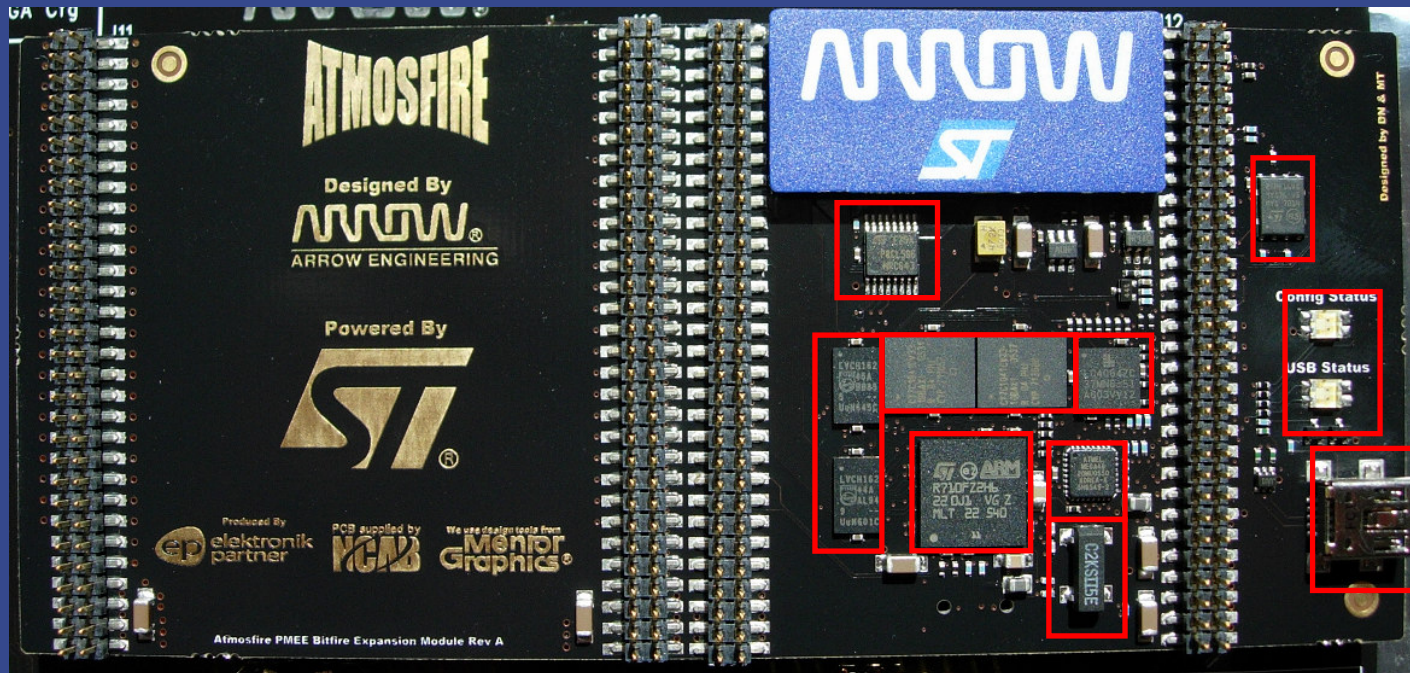
# Bitfire Overview



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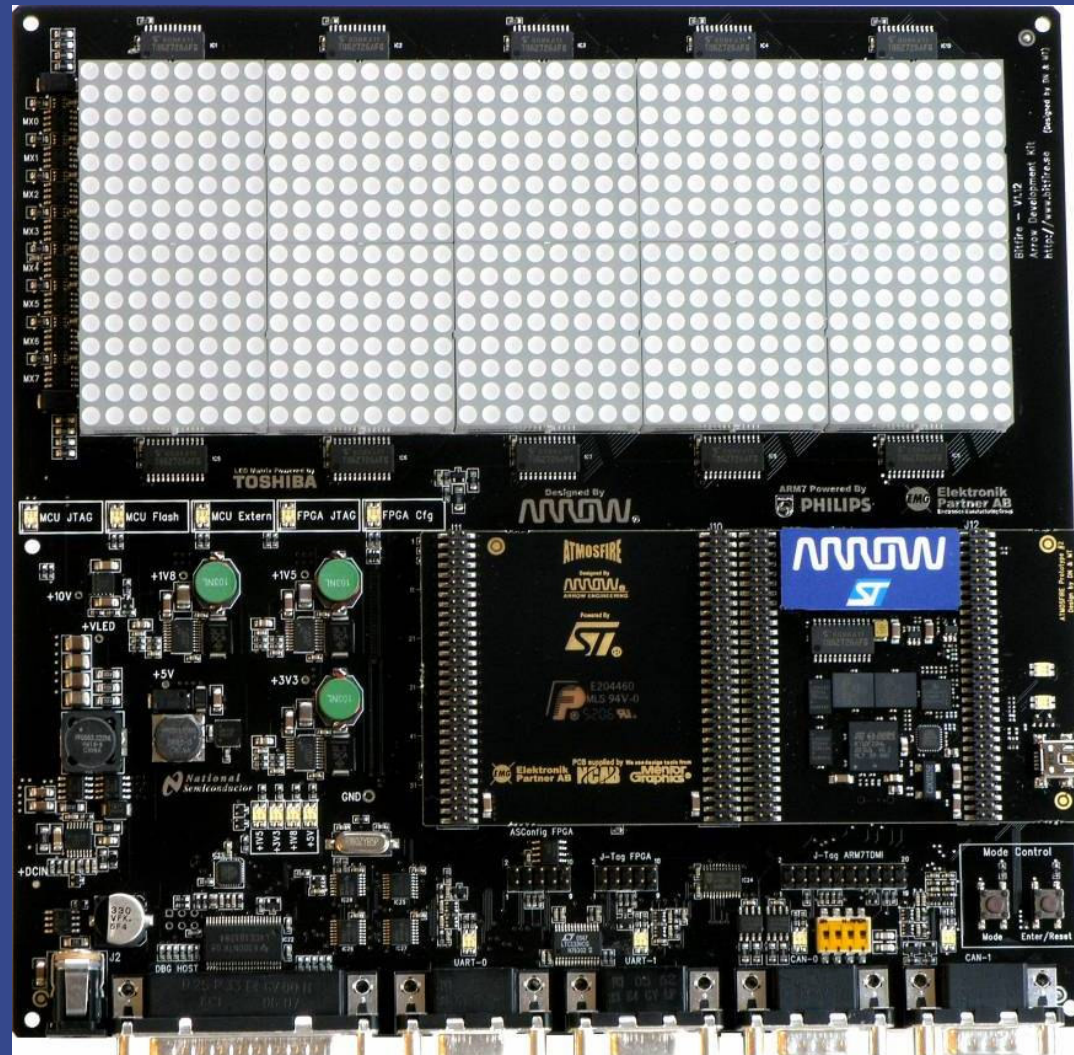


# Atmosfire Overview





# Overview



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## **Onboard debug controller**

**Macraigor® Wiggler™ compatible debugger hardware for the ARM7 core using standard centronics interface.**

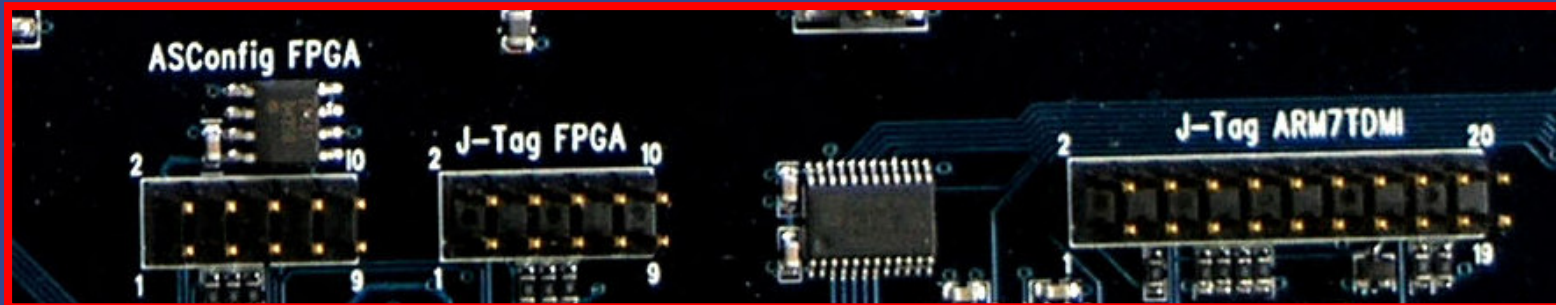
**ByteBlaster-II™ compatible tool against Cyclone FPGA, can be connected as both JTAG tool and configuration programmer.**

**Boot-loader activation for ARM7**

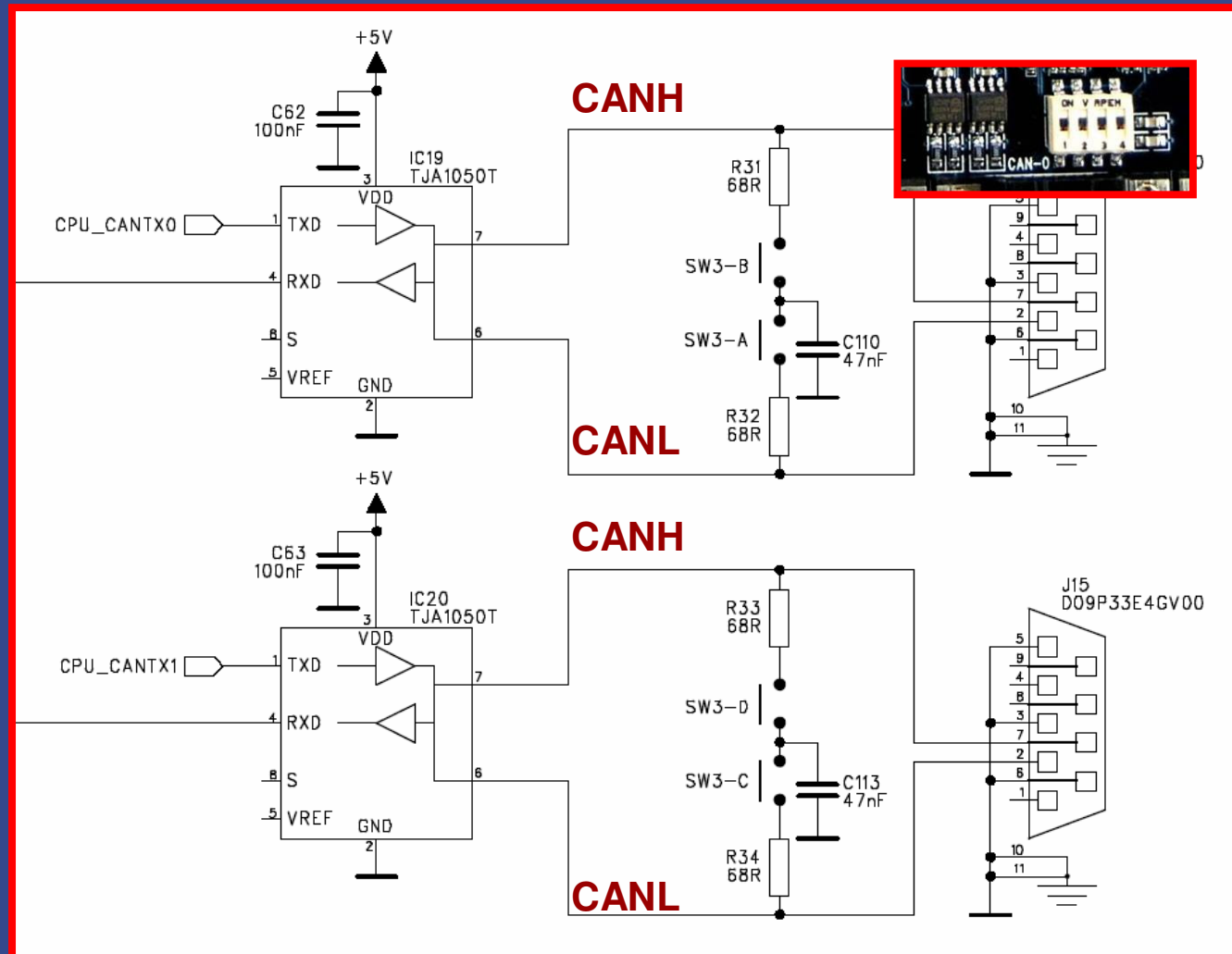
**Reset and configuration control**

## Onboard debug controller

## External tools possible using connectors

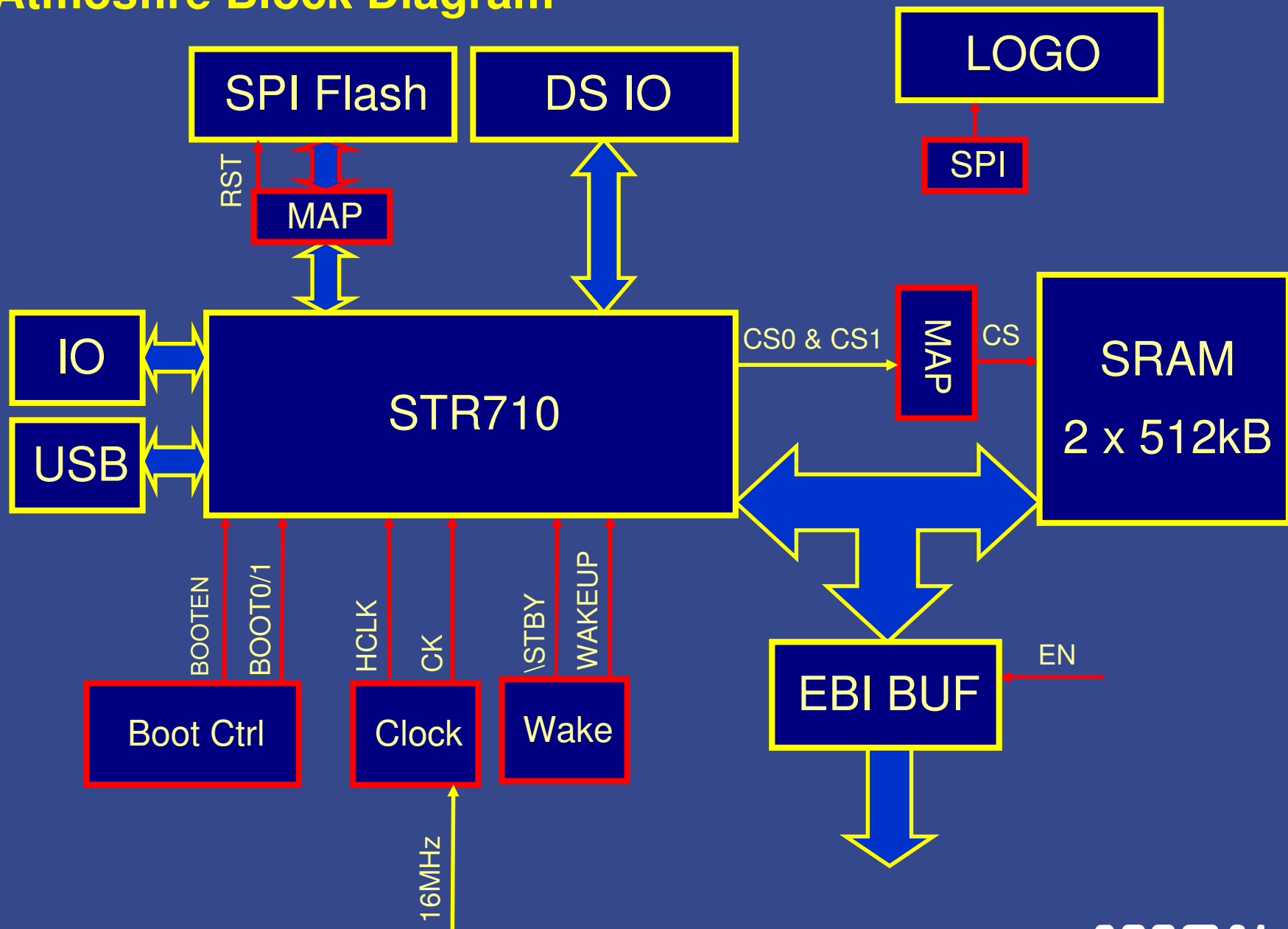


# CAN Interfaces





# Atmosfire Block Diagram



## LEDs

### Two bi-color status leds

#### “Config Status”

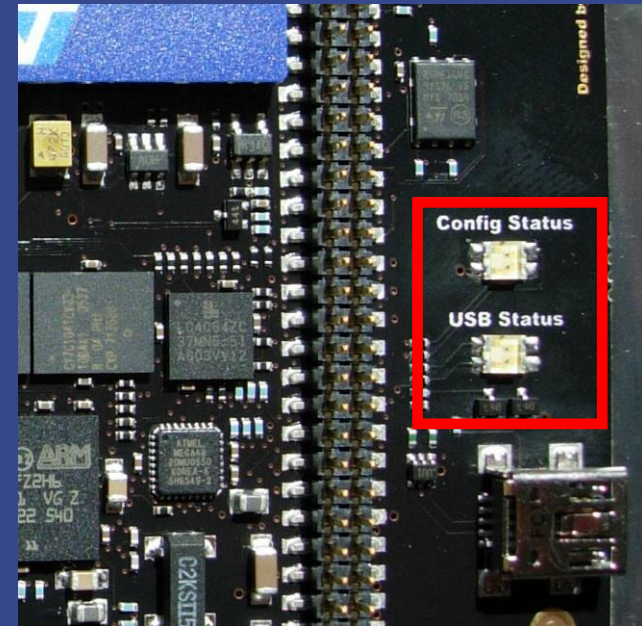
Red – Reset activity

Green – Ping/Interface activity

#### “USB Status”

Red – Controlled by STR710 (P1.9)

Green – USB VDD present



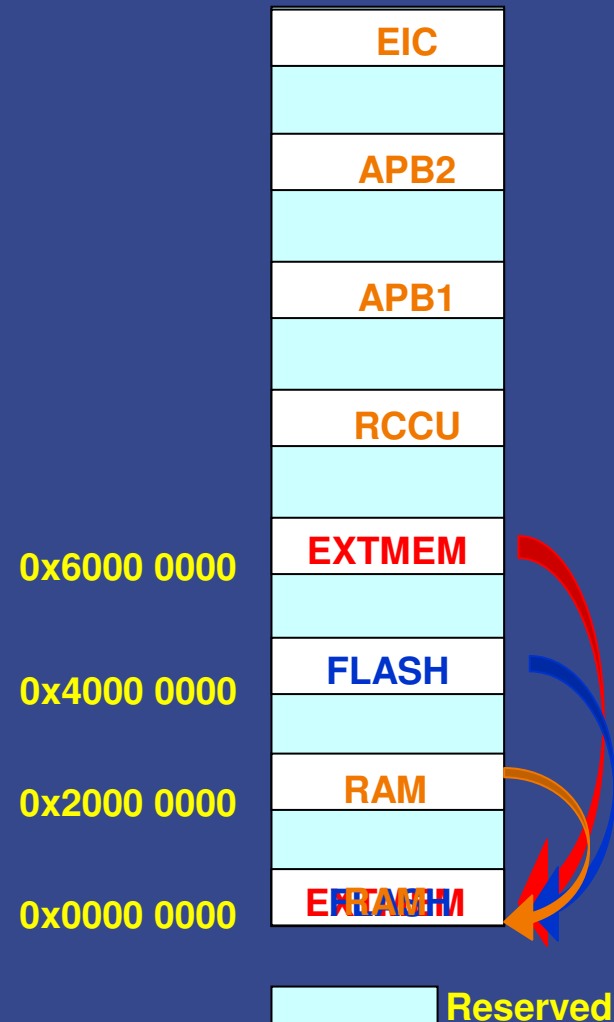
# Memory Mapping and Boot Modes

## Boot modes

A copy of RAM, EXTMEM or FLASH will be aliased at 0x0 depending on BOOTEN, BOOT0 and BOOT1 pins:

## Memory remapping

Memory remapping can be done by software by programming the boot bits in the BOOTCR register

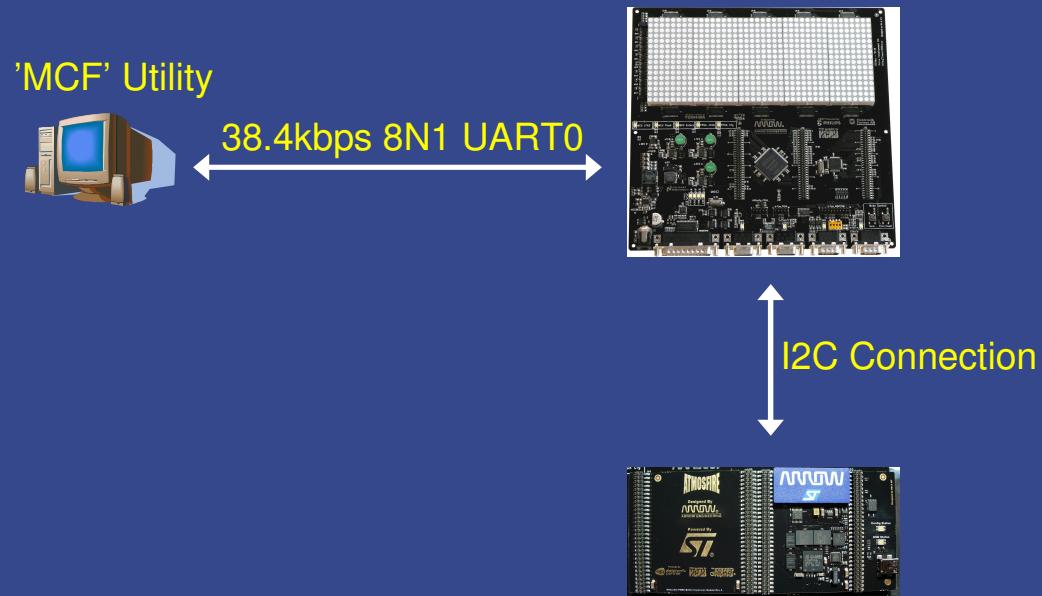




## MagicConfig

- Common configuration system on all our hardware's and the heart of our zero-jumper strategy.
- Board housekeeping can be upgraded by uploading new firmware via built in boot monitor.
- Common configuration utility 'MCF' with built in documentation. "One configuration tool fits all".
- Need something similar? Tiny integration for making housekeeping as economic as possible. Documented and tested, utility written I Python, firmware source available.

# MagicConfig



# MagicConfig, Atmosfire

## 5.2 Configuration word

An internal 16-bit configuration word controls the basic settings of the Atmosfire behaviour, below each of these settings are described. The MCF utility abstraction of these settings is done with keywords for each setting.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
FR	WU	B1	B0	STB	LE	SE	WE	OE	CKE	HE	HS	CK1	CK0	CS	CE

- FR - Flash reset control  
0 = Reset pin forced low (flash disabled)  
1 = Reset driven low under reset conditions otherwise released.
- WU - Wakeup pin (P0.15) drive enable  
0 = Wakeup pin floating  
1 = Wakeup pin pulled trough 2k2 responding to 'ping' commands.
- B1,0 - Boot memory mapping select
- | B1 | B0 | Configuration                               |
|----|----|---------------------------------------------|
| 0  | 0  | Internal flash mapped at 0x00000000         |
| 0  | 1  | Unused                                      |
| 1  | 0  | Internal SRAM mapped at 0x00000000          |
| 1  | 1  | External memory on CS0 mapped at 0x00000000 |



# MagicConfig, Atmosfire

STB	-	Standby pin drive active low Writing this bit: 0 = Standby pin driven low 1 = Standby pin released (pulled up by 10K if not in standby) Reading this bit: Gives the logic level of nSTB (see refmanual on STR710 for more info)
LE	-	Logo Enable 0 = The cool flashing Arrow/ST logo is turned off 1 = The cool flashing Arrow/ST logo is turned on
SE	-	Serial flash \S-pin mapping enable 0 = Pin unmapped (pulled high) 1 = Mapped to P1.8 on the MCU
WE	-	Serial flash \W signal mapping enable 0 = Pin unmapped (pulled high) 1 = Mapped to P2.13 on the MCU
OE	-	External bus buffer enable 0 = External bus A and D signals on connector J3 is disabled 1 = External bus A and D signals on connector J3 is enabled
CKE	-	CK main clock input driver enable 0 = CK pin is floating (external drive possible) 1 = CK pin is driven from CK-generator in CPLD
HE	-	HCLK clock input driver enable 0 = HCLK pin is floating (external drive possible) 1 = HCLK pin is driven from HCLK-generator (4MHz) in CPLD
HS	-	HCLK stop select 0 = HCLK running 4MHz 1 = HCLK stopped

# MagicConfig, Atmosfire

CK1,0 - CK main clock frequency setting

CK1	CK0	Clock setting
-----	-----	---------------

0	0	Tied to GND 0Hz
---	---	-----------------

0	1	4MHz (/4)
---	---	-----------

1	0	8MHz (/2)
---	---	-----------

1	1	16MHz (/1)
---	---	------------

CS,CE External SRAM chip select configuration

CS	CE	Configuration
----	----	---------------

x	0	External SRAM memory disabled
---	---	-------------------------------

0	1	Chip select CS1 mapped for external SRAM
---	---	------------------------------------------

1	1	Chip select CS0 mapped for external SRAM
---	---	------------------------------------------

# MagicConfig, Atmosfire

## 5.3 Application Commands

There are a few unique commands used for writing settings and controlling the behaviour of the Atmosfire. This section describes the native commands through the communication tunnel. MCF utility gives an abstraction of these and is easier to use.

### 5.3.1 RESET

Usage: reset

Result: ok

Resets the MCU and serial flash on the Atmosfire.

### 5.3.2 SETCFG

Usage: setcfg HHHH

Result: ok

Set bits according to given 16-bit hexmask in the configuration word

### 5.3.3 CLRCFG

Usage: clrcfg HHHH

Result: ok

Clear bits according to given 16-bit hexmask in the configuration word

### 5.3.4 GETCFG

Usage: getcfg

Result: HHHH

Reads the configuration word

### 5.3.5 PING

Usage: ping

Result: ok

Pulses the WAKEUP pin if driving of this signal is enabled.

### 5.3.6 PINGTIME

Usage: pingtime HHHH

Result: ok

Sets a periodic WAKEUP ping signal, writing 0000 will disable this feature. If ping command is called the timer for this function is reset for a new period (sync). Resolution is 5.12ms, range is therefore 5.12ms – 335.54s (~6 min)



**MagicConfig**

# Demonstration

**MagicConfig**

**Thanks!**

**See documentation for more details**

***MagicConfig Handbook.pdf***

***Atmosfire Hardware Reference Guide.pdf***

***Atmosfire Design.pdf***