

# **F128B**

## **ATMEGA128 Module**

### **with Arduino bootloader**

## **ATMEL AVR Microcontroller**

## General Description

ATMEGA128A Microcontroller is a powerful 8 bit microcontroller from ATMEL. however, many embedded system designers specially those fresh graduated avoid using it in embedded projects because of its 64 pin TQFP package which complicate layout design and breadboard applications. Even more experienced designers prefer to build their projects depending on Arduino hardware and writing firmware code in Arduino IDE. But , there's no Arduino board based on ATMEGA128 microcontroller.

**F128B Module** solve this problem.

**F128B Module** is a versatile and cheap microcontroller module that make life easy to build your project using smd ATMEGA128A microcontroller chip.

**F128B Module** enable developers to build their projects faster , with lesser hardware bugs and without the need for a specific code burner as well as writing firmware code in friendly Arduino IDE.

CH340 USB/UART converter chip provide direct connection to PC via micro USB socket. With the preloaded Arduino bootloader the module can be used with Arduino IDE.

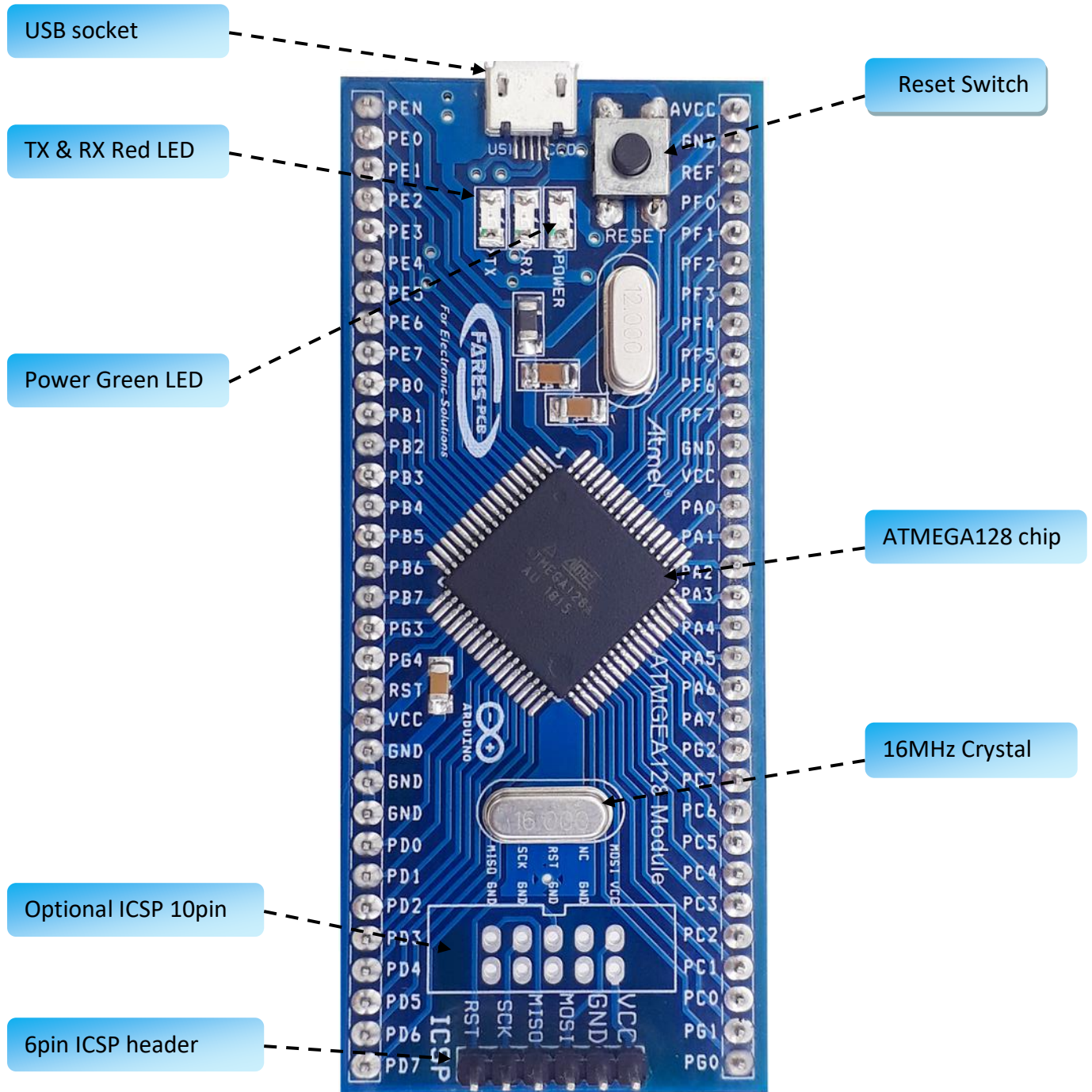
Since the Arduino IDE doesn't support F128B module. We provide an extension to the Arduino software. After installation you can select F128B module as a target board and use it as usual.

**F128B Module** extends all I/O ports to male header pins to match bread board testing and wiring. also it can be plugged in a female header in your application.

**F128B Module** provides a standard 6 pin header ICSP for direct connection to external programmer such as USBasp programmer. Also F128B module contains reset switch , LED for power indication , filtration circuit for Analog supply is added , and bypass capacitors for power pins.

## **F128B Module key features**

- ATMEGA128A microcontroller (128K Flash, 4K SRAM, 4K EEPROM).
- Arduino bootloader preloaded.
- On board 16MHz crystal oscillator.
- Powered from 5V.
- Auto reset function and reset switch.
- CH340 USB/UART converter on USART0.
- USB B type micro female socket for direct connection to PC.
- 6 pin ICSP header socket .
- SMD red LED for TX0 and RX0 signals.
- SMD green LED for power indication.
- All microcontroller I/O pins are brought out via pin header. In addition to REF , RESET and power pins for both sides.
- Size 84mm X 35mm.



**F128B Module**

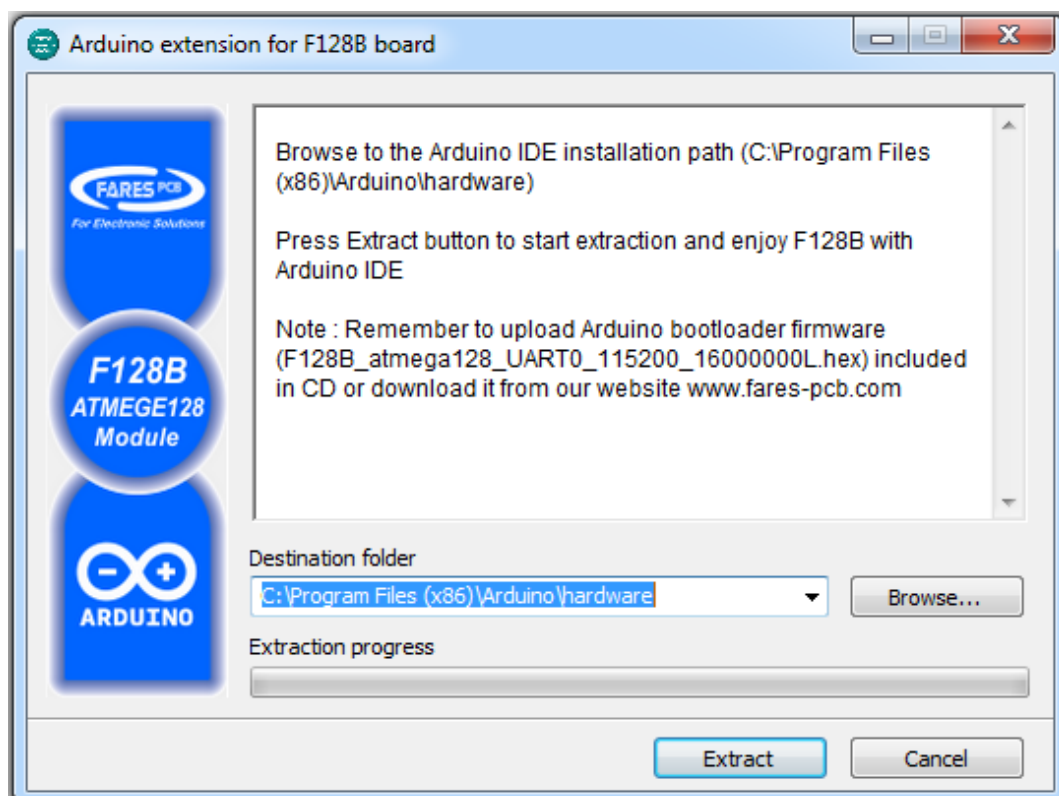


## ATMEGA128A Microcontroller features

- 128KB flash program memory.
- 4KB SRAM.
- 4KB EEPROM data memory.
- 53 Programmable I/O lines.
- 8 Channel 10bit A/D.
- Dual Serial UART.
- Two wire serial interface.
- Master/Slave SPI Interface.
- 6 PWM channels.
- Two 8bit Timer/Counter and two 16bit Timer/Counter.
- Crystal speed up to 16MHz.

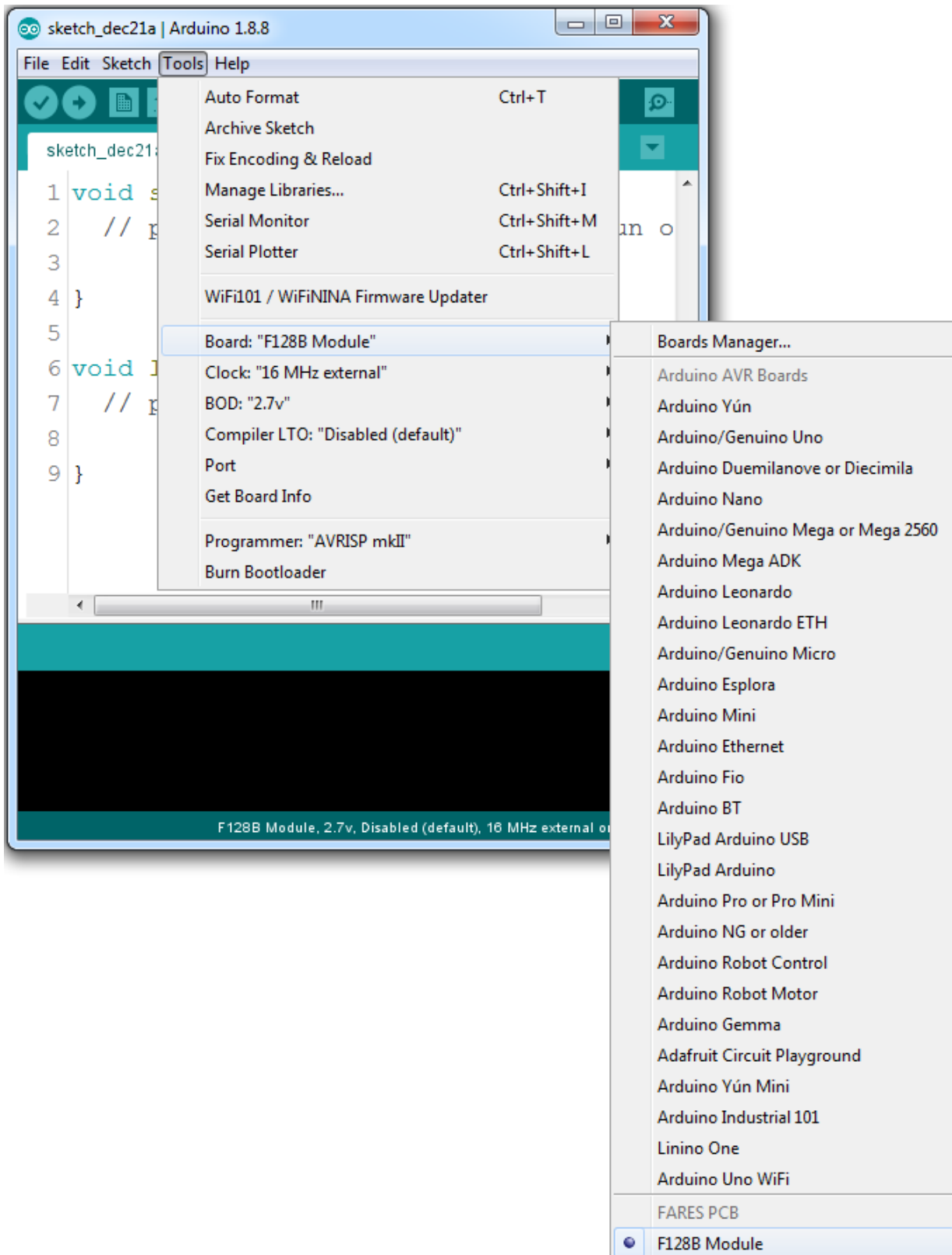
## Programming using Arduino IDE

To add ATMEGA128 module to Arduino boards just Run the self-extracted file(**F128B\_Arduino\_Extension.exe**)included in CD, and browse to the Arduino IDE installation path (C:\Program Files (x86)\Arduino\hardware), and press Extract button to start extraction



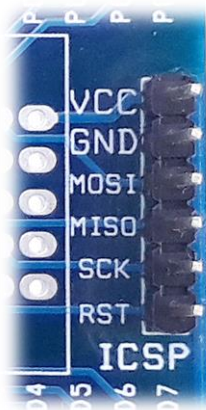


After extraction, **F128B Module** board (from FARESPCB) is added to Arduino Boards. You can select F128B Module and use it as any other Arduino board as following:



## Programming using external programmer

**F128B Module** is designed mainly to be programmed using Arduino bootloader. However, it offers ICSP socket to enable programming using any external programmer that supports standard 6 pin ICSP socket, such as USBasp programmer. Use external programmer to download your own application code or even burning any bootloader other than Arduino bootloader.



6 pin ICSP header socket

Don't forget to set Fuse bytes to the proper values before burning your application firmware .

The recommended fuse bytes are :

Low fuse : &H9F

High fuse : &HC9

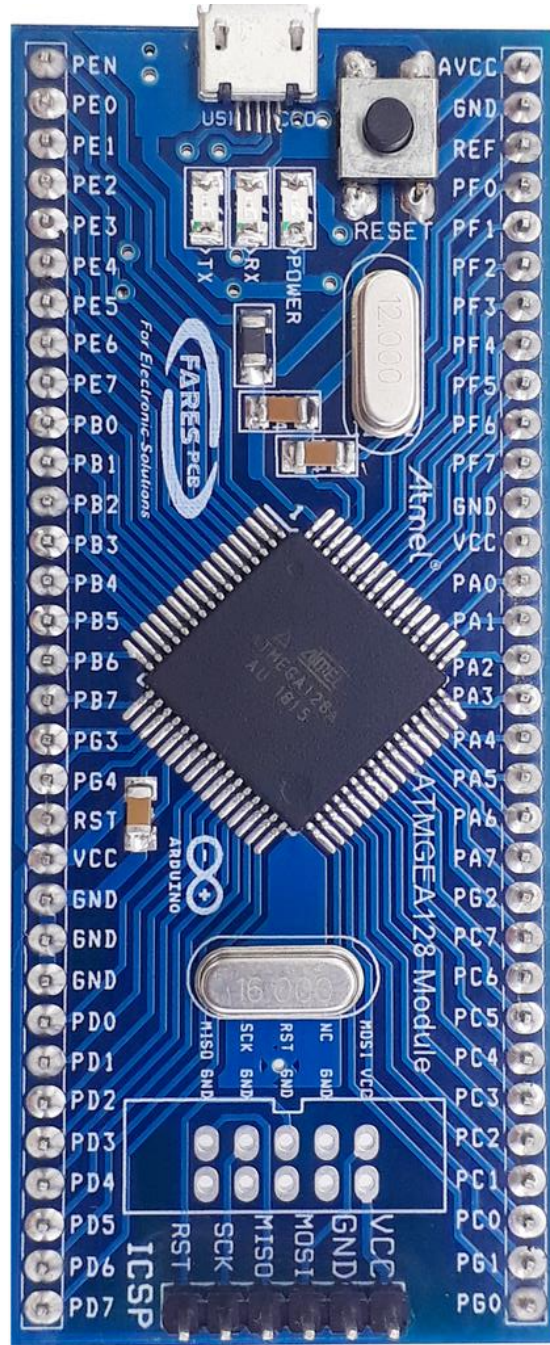
Extended fuse : &HFF

For more details about programming using USBasp programmer, please refer to USBasp CD from FARESPCB products from this link:



**Pin out function of F128B Module**

	Arduino pin	Port pin
1	-	PEN
2	0	PE0
3	1	PE1
4	2	PE2
5	3	PE3
6	4	PE4
7	5	PE5
8	6	PE6
9	7	PE7
10	8	PB0
11	9	PB1
12	10	PB2
13	11	PB3
14	12	PB4
15	13	PB5
16	14	PB6
17	15	PB7
18	16	PG3
19	17	PG4
20	-	RST
21	-	VCC
22	-	GND
23	-	GND
24	-	GND
25	18	PD0
26	19	PD1
27	20	PD2
28	21	PD3
29	22	PD4
30	23	PD5
31	24	PD6
32	25	PD7



Port pin	Arduino pin	
AVCC	-	64
GND	-	63
REF	-	62
PF0	45/A0	61
PF1	46/A1	60
PF2	47/A2	59
PF3	48/A3	58
PF4	49/A4	57
PF5	50/A5	56
PF6	51/A6	55
PF7	52/A7	54
GND	-	53
VCC	-	52
PA0	44	51
PA1	43	50
PA2	42	49
PA3	41	48
PA4	40	47
PA5	39	46
PA6	38	45
PA7	37	44
PG2	36	43
PC7	35	42
PC6	34	41
PC5	33	40
PC4	32	39
PC3	31	38
PC2	30	37
PC1	29	36
PC0	28	35
PG1	27	34
PG0	26	33

**Note:**

1 - Powering F128B module from VCC only with 5V. It's not recommended to power module from AVCC. AVCC is 5V analog output power created internally from VCC supply pin. Use AVCC to power external analog circuits such as voltage divider or operational amplifiers.

2 - F128B Module is shipped with fuse bytes set to ,  
Low fuse : &H9F  
High fuse : &HCC  
Extended fuse : &HFF

Brown-out Detection(BOD): Enabled (2.7V).  
Clock Source: External crystal oscillator.  
Boot reset vector is selected.

Random fuse settings changing is risky. You should take special care while changing these settings. Incorrect fuse settings may cause incorrect microcontroller functioning.

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