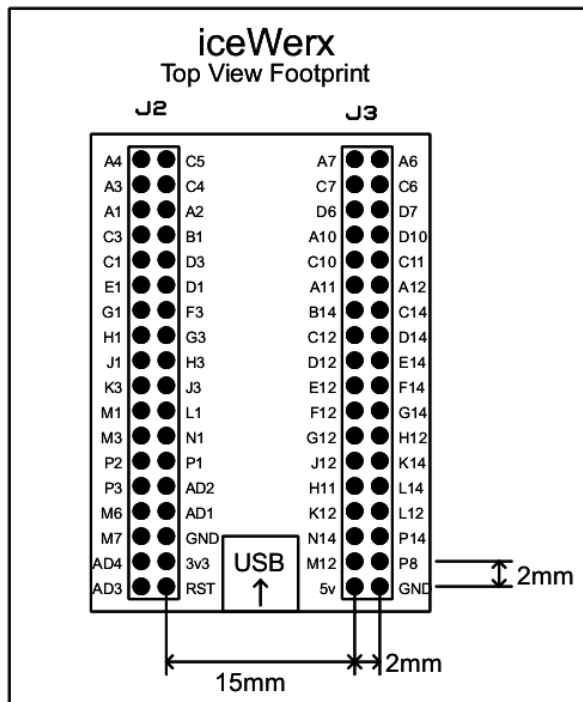


# iceWerx iCE40 HX8K FPGA module

By taking care of all the multiple power supply, sequencing and bitstream support, iceWerx provides an easy to use FPGA module ready to integrate into your own project.

The iceWerx Module may be soldered directly to your PCB or mounted in sockets such as the samtec SQW-118-01-L-D



Uses Lattice ICE40HX8K-CB132  
7680 LUT's  
128 Kbits RAM (32 x 4Kbit blocks)  
2 PLL's  
63 FPGA I/O's on module  
4 10-bit A/D inputs (via PIC CPU)

Lattice ICE40HX8K documentation is here:  
[www.latticesemi.com/Products/FPGAandCPLD/iCE40](http://www.latticesemi.com/Products/FPGAandCPLD/iCE40)

## Oscillator

An on-board 12MHz oscillator feeds pin P7 (GBIN5)

## LEDs

Red LED on A5  
Green LED on M4

## 10-bit A/D converters

Accessed via serial commands to PIC CPU  
250k baud, 1 start, 8 data, 1 stop, no parity  
Tx on in P4, Rx on pin P5  
AD1 - send command 0xA1  
AD2 - 0xA2  
AD3 - 0xA3  
AD4 - 0xA4  
Receive 2 bytes, low byte first.  
Combine for 10 bit right justified result.

## 8Mb (1MB) SPI Flash

CS – P13  
SCK – P12  
SDI – P11 (SDO on flash chip)  
SDO – M11 (SDI on flash chip)  
First three 64k sectors reserved for FPGA configuration.

The iceFUN module is powered from USB or an external 5v supply. There are on-board 3.3v and 1.2v regulators.

**All PIC and FPGA I/O pins are 3.3v, do not connect these to 5v devices.**

IceFun is programmed using iceFUNprog.  
Linux users can download the source from our github at <https://github.com/devantech/iceFUNprog>  
A Windows version (.exe and c# source) is available at [www.robot-electronics.co.uk/files/iceFUNprog.zip](http://www.robot-electronics.co.uk/files/iceFUNprog.zip)

Any toolchain which generates a binary bit-stream may be used, such as lattice iCEcube2. Linux users also have the icestorm tools with yosys and nextpnr.  
<http://www.clifford.at/icestorm/>

