

tinyWireless Specifications



<http://modtronicsaustralia.com>

FEATURES AT A GLANCE

PIC32 32-bit uC:

- Up to 50MHz
- 128kB of program FLASH
- 32kB of RAM
- 30 digital IO pins
- 8 with A/D functionality
- Programmable peripherals
- USB; DMA; UART; SPI; RTCC

Optional RFM69HW:

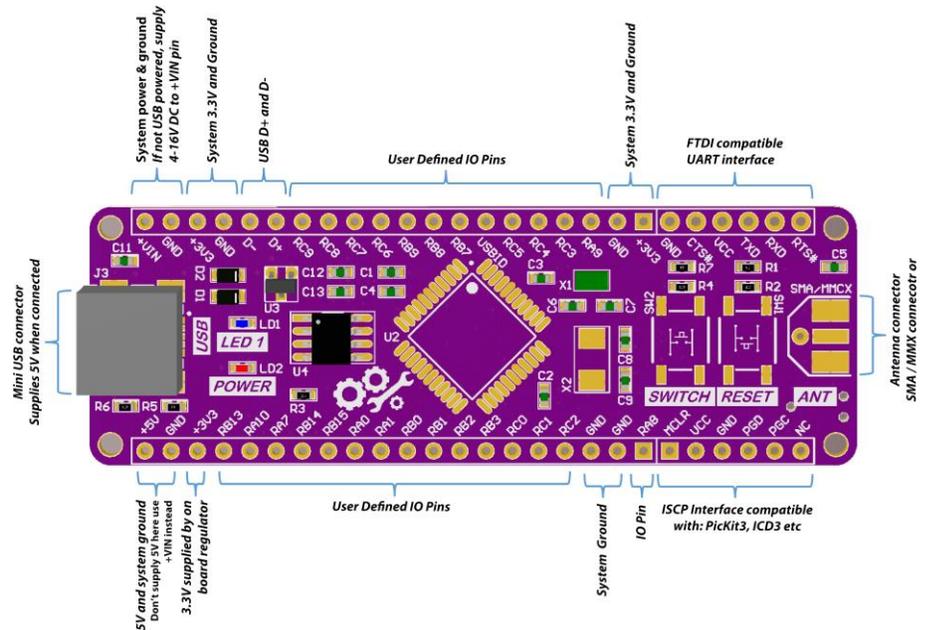
- Long range wireless comms
- ISM bands: 433/868/915MHz
- +20dBm output pwr -1km+ range
- AES-128bit encryption

Software compatibility:

- C / C++
- Arduino compatible

Breadboard mountable

TINYWIRELESS HARDWARE OVERVIEW



TINYWIRELESS SYSTEM OVERVIEW

TinyWireless is the latest in our range of very successful PIC32 & PIC24 development boards. It features a powerful PIC32MX250F128D MIPS32® M4K® core 32-bit microcontroller capable of running at up to 50MHz (83 MIPS – Million Instructions Per Second).

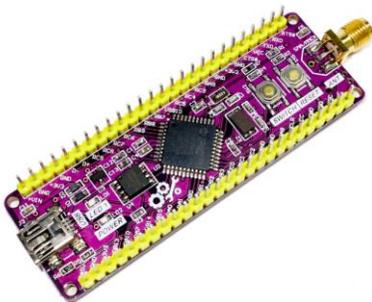
Also optionally installed on your TinyWireless platform is a long range ISM band RFM69HW wireless transceiver. Capable of wireless transmission speeds of up to 300kbps with AES-128 bit encryption (to counter wireless sniffing) and ranges in excess of 1km!

For data logging applications TinyWireless is equipped with a 32Mbit SPI FLASH and USB or UART ports for communications with your PC.

You also have access to an on board user definable switch and LED. Along with full support for Real Time Clock (RTCC) functionality using the PIC32's RTCC hardware and the installed 32.768kHz watch crystal.

All this in a breadboard mountable module that measures only 74 x 25mm!

TinyWireless can be programmed natively in C/C++ for ultimate power and control or using opensource tools you can write your TinyWireless application as an Arduino sketch! The tinyWireless is has a Fubarino Mini compatible footprint for easy Arduino programming.



TINYWIRELESS TECHNICAL SPECIFICATIONS

Feature	Details
Microcontroller:	<p>PIC32MX250F128D – 32-bit microcontroller:</p> <ul style="list-style-type: none"> • 50MHz (83 MIPS – Million Instructions Per Second) • 128kB of program FLASH memory; • 32kB of RAM • User programmable peripherals – peripherals can be remapped to IO pins using software • Extensive peripheral support: USB; DMA; Real Time Clock (RTCC); UART; SPI; Analog to Digital converters (A/D); I2C; PMA; PWM; etc • Five 16-bit timers; can be combined into 32-bit timers • Industry leading low power operation and sleep mode support – ideal for battery powered applications • 8 usable analog inputs
Wireless Module (optional):	<p>RFM69HW long range wireless module:</p> <ul style="list-style-type: none"> • 433, 868 or 915MHz – band selectable at purchase time • +20dBm output power (software programmable) • -121 dBm sensitivity @1.4kpbs • Capable of long range links – in excess of 1km • AES-128 bit encryption and CRC16 error checking • On chip FIFO and packet handling engine • Choice of modulation types: FSK, GFSK, MSK, GMSK and OOK • Low operating current and ultra-low power shutdown mode (100nA) - ideal for battery powered applications • Variable data rates: 0.123 to 300kbps • SPI interface • Superior antenna options: <ul style="list-style-type: none"> ○ SMA / MMX compatible PCB footprint (installed SMA connector available at time of purchase) – great for high gain antennas! ○ Simple wire antenna – great for low cost and space constrained applications!
On board FLASH memory:	<p>32Mbit WINBOND on board FLASH chip Ideal for data logging applications SPI interface</p>
Other board features:	<p>On board regulator USB or externally powered 32.768kHz crystal for PIC32 hardware real time clock (RTCC) Mounting holes User LED and Switch Breadboard mountable! (Fubarino Mini compatible footprint for Arduino use)</p>
Power supply:	<p>Nominally 5V DC (4-16V DC range):</p> <ul style="list-style-type: none"> • USB powered OR • Externally powered through +VIN pin (4-16V) <p>On board 3.3V regulator Some PIC32 pins are 5V tolerant (see IO Pin table below) All devices selected support low power operating modes:</p> <ul style="list-style-type: none"> • Ideal for battery powered applications
UART Header:	<p>FTDI USB to UART cable compatible header:</p> <ul style="list-style-type: none"> • Great for debugging • Support 3.3V FTDI cables only!
Dimensions:	74 x 25mm
PCB:	High quality 4-layer ENIG PCB – with our distinctive purple soldermask!

TINYWIRELESS IO PIN FUNCTIONS

Pin	5V Tolerant	A/D	Other
General System Pins			
+VIN	-	-	Supply 4-16V DC if no USB power connected
GND	-	-	System ground pins
+5V	-	-	+5V from USB OR +VIN whichever is the greater – for user use as appropriate – use with caution!
+3V3	-	-	3.3V DC generated by the on board 3.3V regulator.
IO Pins			
D-	-	-	USB D+
D+	-	-	USB D-
RC9	Yes	No	Digital IO Pin
RC8	Yes	No	Digital IO Pin
RC7	Yes	No	Digital IO Pin
RC6	Yes	No	Digital IO Pin
RB9	Yes	No	Digital IO Pin; Chip select for 32Mbit SPI flash
RB8	Yes	No	Digital IO Pin; SPI SCK (clock) for RFM69HW & SPI Flash
RB7	Yes	No	Digital IO Pin; DIO0 (interrupt) for RFM69HW (if installed)
USBID	Yes	No	USBID Pin
RC5	Yes	No	Digital IO Pin
RC4	Yes	No	Digital IO Pin; Connects to UART CTS# header pin
RC3	No	Yes	Analog & Digital IO Pin
RA9	Yes	No	Digital IO Pin; Chip select for RFM69HW (if installed)
RA8	Yes	No	Digital IO Pin ; User Switch
RC2	No	Yes	Analog & Digital IO Pin; Connects to UART RTS# header pin
RC1	No	Yes	Analog & Digital IO Pin; Connects to UART TXD header pin
RC0	No	Yes	Analog & Digital IO Pin; Connects to UART RXD header pin
RB3	No	Yes	Analog & Digital IO Pin; SPI MOSI for RFM69HW & SPI Flash
RB2	No	Yes	Analog & Digital IO Pin; SPI MISO for RFM69HW & SPI Flash
RB1	No	Yes	Analog & Digital IO Pin
RB0	No	Yes	Analog & Digital IO Pin
RA1	No	Yes	Analog & Digital IO Pin
RA0	No	Yes	Analog & Digital IO Pin
RB15	No	Yes	Analog & Digital IO Pin
RB14	No	Yes	Analog & Digital IO Pin
RA7	Yes	No	Digital IO Pin
RA10	Yes	No	Digital IO Pin; User LED
RB13	No	Yes	Analog & Digital IO Pin
FTDI compatible UART Interface – compatible with FTDI 3.3V USB to UART cables			
GND	-	-	System Ground – connected to FTDI cable gnd
CTS#	Yes	No	Connects to FTDI cable CTS# pin; also RC4
VCC	-	-	Not connected (no connection to tinyWireless VCC/3.3V)
TXD	No	Yes	Connects to FTDI cable TXD pin; also RC1
RXD	No	Yes	Connects to FTDI cable RXD pin; also RC0
RTS#	No	Yes	Connects to FTDI cable RTS# pin; also RC2
Microchip ICSP Interface – for use with PicKit3, ICD3 and other PIC programmers			
MCLR	-	-	Master clear or Reset pin; pull low to RESET uC
VCC	-	-	Connects to tinyWireless 3.3V rail
GND	-	-	Connects to tinyWireless system ground
PGD	-	-	ICSP PGD pin (PGEC1)
PGC	-	-	ICSP PGC pin (PGED1)
NC	-	-	Not connected