

## FLYPORT Wi-Fi 802.11G

System on module

- 802.11g WIFI
  - Infrastructure mode
  - softAP mode
  - Ad hoc mode
- Microchip PIC 24F 16 bit processor
- Microchip MRF24WG0MA/MB
  - Native WiFi 802.11g transceiver
  - PCB Antenna or uFL connector
- 16Mbit Flash Memory for web server and FOTA
- FOTA: Firmware upgrade over Internet
- Easy development with openPicus free IDE. Open source framework based on freeRTOS
- Serial bootloader onboard
  - Webserver (customizable)
  - TCP
  - FTP
  - UDP
  - SNTP
  - SMTP

- 5V or 3.3V power supply
- RTCC onboard
- Remappable pins at runtime
- Digital I/Os, Analog Inputs
- 4 UARTs, 1 SPI, 1 I2C

### Applications

- Webserver based user interfaces to the embedded
- Sensors and automation
- Internet of Things
- Audio over IP
- Building automation and remote control
- Industrial/process management

### Introduction

FLYPORT Wi-Fi is a miniature **web server module** featuring a fully integrated 802.11g Wi-Fi interface and several interfaces to the 'real world'.

The module integrates a powerful **16 bit processor** which runs custom applications and a **Wi-Fi certified transceiver** which handles the connectivity. 2 versions are available: one with PCB antenna and the other with uFL connector for an external antenna.

The module provides the embedded world with a powerful 'Internet engine' to a browser-based interface over Internet, in a small footprint, at low power and low cost. Real time data can be both displayed and/or updated from a standard web browser, even on smartphone or tablets, because FLYPORT supports dynamic web pages.



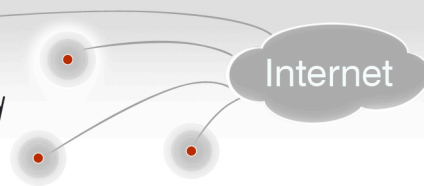
FLYPORT is powered by openPicus framework based on FreeRTOS. The free IDE allows to create applications, to import web pages and to compile and download code to the module.

The module form factor is compatible with Flyport Ethernet and Flyport GPRS modules and pin compatible on J1 connector.

### Features

16 Bit Processor	PIC24FJ256, 256K Flash, 16K Ram, 16Mips@32Mhz
Transceiver	MRF24WG0MA/MB 802.11g Wi-Fi certified
Power Supply	5V or 3,3V, integrated LDO
Integrated RTC	32,768 Khz quartz onboard
Digital I/O	up to 18, remappable at Runtime
Analog In	up to 4, 10bits ADC, Vref=2,048V
Communication	up to 4 UARTs, SPI, I2C
Flash	SST25VF016B 16Mbit storage Flash memory
Connector	26 ways, 2 rows, standard 2.54mm male pin header
Dimensions	35 x 48 x 15 mm, 11 grams

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## Introduction

FLYPORT Wi-Fi is powered by openPicus framework and mounts a 256K Flash 16bit processor from Microchip that runs the Wireless Stack and the application layer. This means that you have full control of the connectivity (extremely important for energy saving) and the application (for ex. the PIC microcontroller onboard can process data coming from an analog sensor and display these data on the integrated webserver, or send by email or save to a remote FTP server). FLYPORT has an extra 16Mbit Flash memory onboard to store web server pages and for Firmware upgrade over Internet.

FLYPORT Wi-Fi works in 3 ways:

- Infrastructure mode      Flyport connects to a Wi-Fi network (to access points or routers)
- softAP                      Flyport itself acts like an access point. It's limited to 1 client only
- Ad Hoc                      Point to point. *Deprecated since not compatible with Android devices!*

Available pins:

SPI, I2C, UART and embedded Real Time clock.

I/O : analog and digital and PWM.

Most of pins are remappable at runtime.

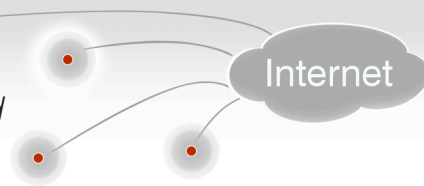
Programming:

Download the free IDE from [www.openpicus.com](http://www.openpicus.com).

C programming skills are needed. No expansive programmer is needed since the serial bootloader loaded on the module allows you to flash the firmware using just a serial cable.

On [www.openpicus.com](http://www.openpicus.com) you can find examples, libraries and tools to start to develop immediately.

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## Electrical characteristics

### VOLTAGE RATINGS

**+5V DC Voltage input (pin 16)**

**MIN: 3,6V MAX:+5V**

It's possible to power the module using a Lithium battery

**+3.3V DC Voltage input (pin 24)**

**MIN:+3,0V MAX:+3,3V**

### CURRENT CONSUMPTION

Power supply 5V, all Leds onboard turned off, Ambient temperature 25°C

**Wi-Fi not connected**

**39,75 mA**

(Micro ON and Wi-Fi on but not connected)

**Wi-Fi connected**

**162,70 mA**

(Micro ON and Wi-Fi infrastructure mode connected to an access point)

**Wi-Fi burst**

**282,50 mA**

(RF Burst on data TX)

**Hibernate mode**

**28,21 mA**

(Micro ON and Wi-Fi transceiver OFF)

**Sleep mode**

**1,44 mA**

(Micro OFF and Wi-Fi transceiver OFF)

## Wi-Fi 802.11g (Microchip transceiver MRF24WG0MA/MB)

**Certifications**

**FCC (USA), IC (Canada), ETSI (Europe)**

For detailed info about the transceiver and related documentation (FCC ID and more) please visit <http://ww1.microchip.com/downloads/en/DeviceDoc/70686B.pdf>

**Security**

**WEP, WPA-PSK, WPA2-PSK Security**

**Frequency range**

**2412-2484 Mhz**

**Output power**

**16 dBm**

**Sensitivity**

**RX min input level, 1Mbit, 8%PER: -95 dBm**

**RX min input level, 2Mbit, 8%PER: -88 dBm**

**Encryption**

**AES128**

**RSSI**

**Yes**

## Mechanical info

**Dimensions**

**35\*48\*15mm**

**Weight**

**12 grams**

## Temperature range

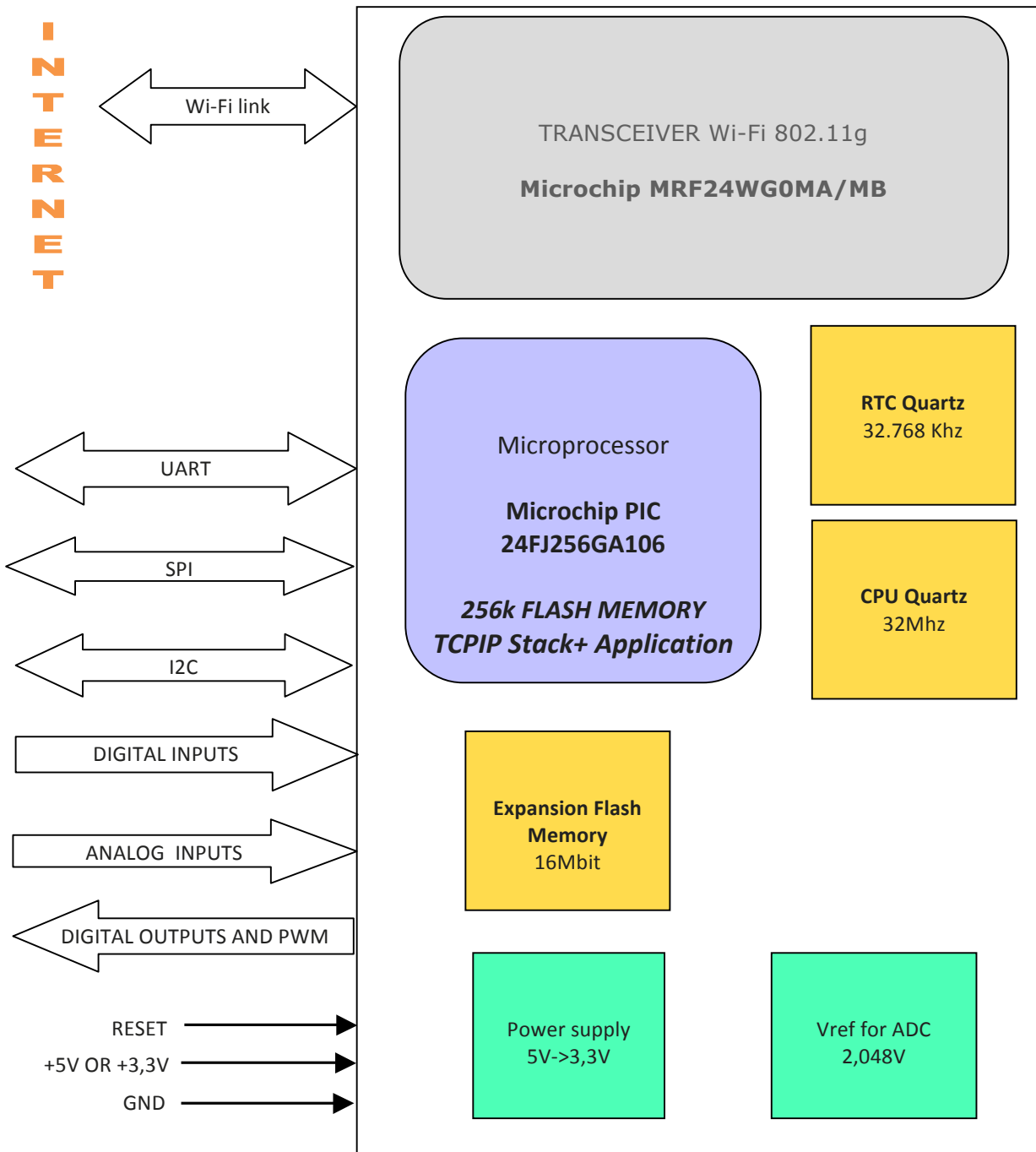
**Operating range**

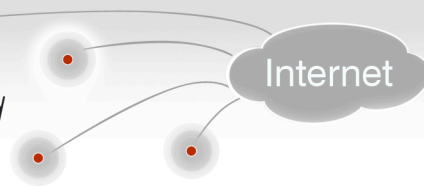
**MIN: -20°C MAX: +85°C**

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Internet

## Block Diagram





## J1 Connector

J1 is the main and **common** connector of each module of the FLYPORT family.

FLYPORT modules are based on Microchip PIC processor and offer **remappable pins function**. User can customize the hardware configuration by firmware. It means that you can have up to 4 UARTs , up to 18 Digital I/Os and 9 independent PWMs.

Pin	Pin Name	Description (default setting)	5V Tolerant	Remappable
1	p1	GPIO (I2C bus Clock signal by default)	Yes	No
2	p2	GPIO (input by default)	Yes	Yes
3	p3	GPIO (I2C bus Data signal by default)	Yes	No
4	p4	GPIO (output by default)	Yes	Yes
5	p5	GPIO (input by default)	Yes	Yes
6	p6	GPIO (output by default)	Yes	Yes
7	p7	GPIO (input by default)	Yes	No
8	p8	GPIO (SPI bus Clock SCLK by default)	Yes	Yes
9	p9	GPIO (input by default)	Yes	Yes
10	p10	GPIO (SPI bus Out SDO by default)	Yes	Yes
11	p11	GPIO (input by default)	Yes	Yes
12	p12	GPIO (SPI bus In SDI by default)	Yes	Yes
13	p13	UART RX input	Yes	Yes
14	p14	GPIO (SPI bus chip select CS by default)	Yes	Yes
15	p15	UART TX output	Yes	Yes
16	p16	+5V Power supply input ( <i>note 1</i> )	-	-
17	p17	GPIO (output by default)	No	Yes
18	p18	Analog input #4 ( <i>note 2</i> )	No	Yes
19	p19	GPIO (output by default - connected on red Led OUT4)	No	Yes
20	p20	Analog input #3 ( <i>note 2</i> )	No	Yes
21	p21	GPIO (output by default - connected on red Led OUT5)	No	No
22	p22	GND ( <i>ground</i> )	-	-
23	p23	Analog input #1 ( <i>note 2</i> )	No	Yes
24	p24	+3.3V ( <i>see note 1</i> )	-	-
25	p25	Analog input #2 ( <i>note 2</i> )	No	Yes
26	p26	Reset ( <i>Active Low</i> )	No	Yes

**Note 1.** FLYPORT can be powered at 5V or at 3.3V. If the module is powered by 5V on pin 16, pin 24 is the output of integrated LDO (max output current available: 100mA). If powered by 3,3V on pin 24, you must leave pin 16 unconnected!

**Note 2.** FLYPORT has a precise voltage reference for analog 2,048V: this is the max voltage readable by these pins

**Note 3.** It is possible to turn off the green Led D3 (PWR). It's controlled by the pin 64 (RE4) of the PIC processor .

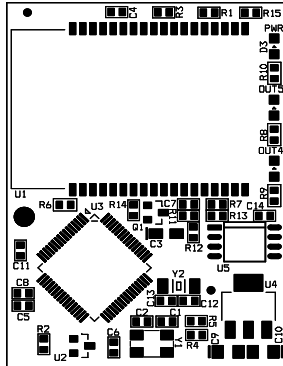
Pins 16-18-20-22-24-26 are directly compatible with the Microchip Pickit programmer connector

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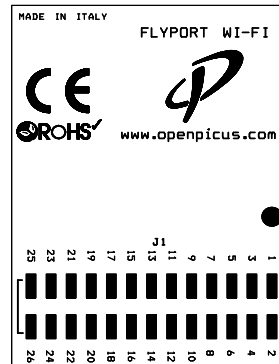
Internet

## Mechanical Information

TOP LAYER



BOTTOM LAYER



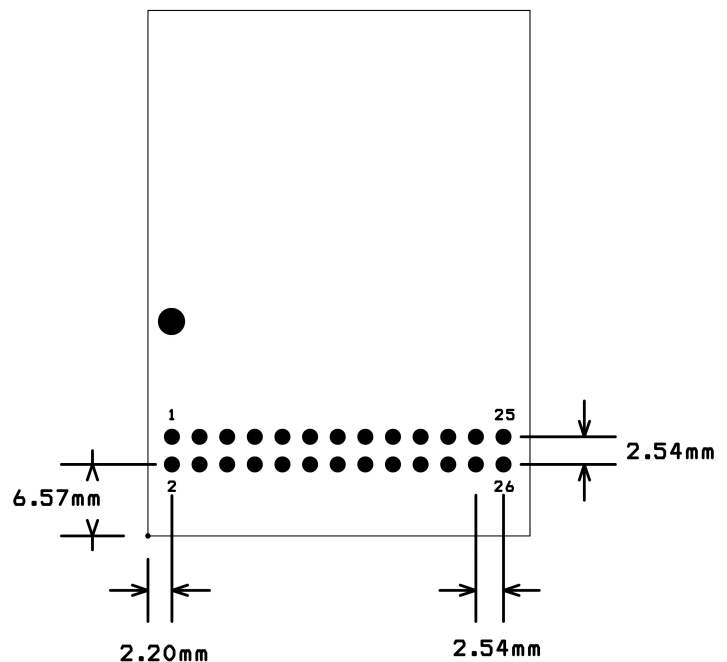
## Footprint information

J1 connector is on the bottom side and it's a standard 2\*13 ways 2.54mm male pin header (SAMTEC TSM-113-01-F-DV). It is compatible with standard female pin headers or directly with an IDC connector on flat cable.

Suggested Female connectors:

SAMTEC	SSW-113-01-T-D
FCI	65781-013

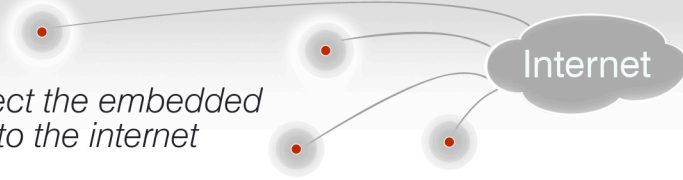
VIEW FROM TOP SIDE



### FIXING HOLE

The 2.5mm diameter hole may be used for mechanical fastening.

Considering the low right corner the origin (x=0, y=0) its center is placed at (x=2.20mm y=20mm)



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## Ordering information

Buy online from our store or through our resellers and distributors.

**Code OP015351** FLYPORT Wi-Fi 802.11g PCB Antenna  
**Code OP015352** FLYPORT Wi-Fi 802.11g uFL connector for external Antenna

## How to start development

Visit our website [www.openpicus.com](http://www.openpicus.com) to download the IDE, a getting started guide and application notes, examples and libraries.

On our Store there are also some **starter kits** composed by one module, one Nest carrier board and a miniUSB programmer.

Each FLYPORT Module has a serial bootloader onboard.