

## Nano WiReach™ MAX-SMT

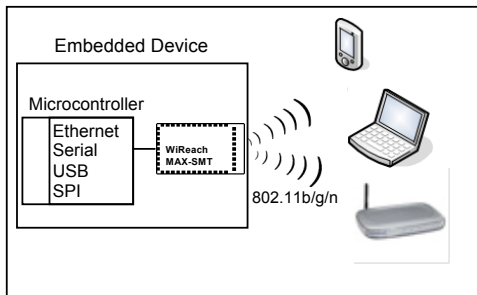
### Station or Access Point - Switchable

### Miniature embedded secure

### 802.11b/g/n WiFi SMT module

#### General Description:

Nano WiReach™ MAX-SMT is a secure embedded Wireless LAN module that easily connects embedded devices to 802.11b/g/n Wireless LAN, 10/100BaseT wired LAN and cellular WAN. It includes the iChip™ CO2144 IP Communication Controller™ chip and Marvell 88W8787 WiFi chipset. It is packaged in a 37x20mm RoHS-compliant ultra-slim low profile 44-pin SMT module form factor with an on-board or external antenna.



Nano WiReach MAX-SMT makes adding Internet connectivity to embedded devices a breeze. It does not require any kind of WiFi driver development on the host CPU, and its multiple interfaces (UART, SPI, RMII and USB 1.1) minimize the need to redesign the host device hardware.

Connect One's high-level AT+i™ API eliminates the need to add WiFi, LAN or cellular drivers, security and networking protocols or communication tasks to the host application.

Nano WiReach MAX-SMT supports the SSL3/TLS1 protocol for secure sockets, HTTPS and FTPS, WEP, WPA/WPA2 (PSK and Enterprise) WiFi encryption.

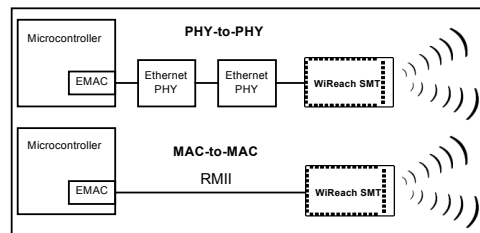
Nano WiReach MAX-SMT firmware and configuration parameters are stored in on-board flash memory. The module is power-efficient: the core operates at 1.2V, while I/Os operate at 3.3V. Power Save mode further reduces power consumption.

#### Typical applications:

- ❖ Adding WiFi to serial embedded devices
- ❖ Replacing LAN cable using WiFi (bridge)
- ❖ WiFi/LAN/Cellular Router
- ❖ Adding SSL security to M2M solutions

Nano WiReach MAX-SMT supports several operation modes:

- LAN to WiFi Bridge - allowing transparent bridging of LAN over WiFi, using direct RMII connection to existing MAC hardware or direct PHY-to-PHY connection.



- SerialNet™ Serial to WiFi Bridge - allowing transparent bridging of Serial over WiFi, using a 3Mbps fast UART. This is a true plug-and-play mode that eliminates any changes to the host application.
- PPP modem emulation - allowing existing (e.g. modem) designs currently using PPP to connect transparently over WiFi
- Embedded Access Point - WiFi access point. Includes a DHCP server, NAT and port forwarding.
- Embedded Router - Providing routing facilities between a wired LAN subnet a WiFi subnet and a cellular WAN connection. Includes a DHCP server, NAT and port forwarding.
- Full Internet Controller mode - allowing simple MCU to use the Nano WiReach MAX-SMT's rich protocol and application capabilities to perform complex Internet operations such as E-mail, FTP, SSL, embedded web server and others. It also acts as a firewall, providing a security gap between the application and the network.

The II-EVB-365N evaluation board provides an easy environment for evaluating the Nano WiReach MAX-SMT.

### Hardware Description:

- Size: 37.0 x 20.0 x 2.5 mm
- Core CPU: 32-bit RISC ARM7TDMI, low-leakage, 0.13 micron, at 48MHz
- Operating Voltage: +3.3V+/-10%
- Operating Humidity: 90% maximum (non-condensing)
- Operating Temperature Range:

Industrial	Commercial
-30°C to +85°C	-20°C to +70°C
-22°F to 185°F	-4°F to 158°F

- Power Consumption:
  - Transmit – 170mA@11Mbps, 280mA@54Mbps, 275mA@72Mbps (typical)
  - Receive – 190mA (typical)
  - Power Save mode – 7mA
- Optional: On-Board Antenna
- Optional: U.FL RF Connector
- Connection: 44 SMT pads
- Host Interface: Serial, SPI, USB Device
- A/D Input
- Cellular Modem Interface: USB Host
- 10/100 BaseT LAN Interface: RMII (w/ext. PHY)
- RoHS-compliant; lead-free

### Wireless Specifications:

- Standards supported:
  - IEEE 802.11b/g/n
- Frequency: Europe – 2.412-2.472GHz  
USA – 2.412-2.462GHz  
Japan – 2.412-2.484GHz
- Channels: Europe – 13 channels  
USA – 11 channels  
Japan – 14 channels

### Performance Specifications:

- Host Data Rates:
  - UART: Up to 3Mbps
  - SPI: Up to 12Mbps
  - USB 1.1: Up to 6Mbps
- Serial Data Format (AT+i mode): Asynchronous character; binary; 8 data bits; no parity; 1 stop bit
- Serial Data Format (SerialNET mode): Asynchronous character; binary; 7 or 8 data bits; odd, even, or no parity; 1 stop bit

- Flow Control: Hardware (-RTS, -CTS) and software flow control.

### Internet Protocols:

- ARP, ICMP, IP, UDP, TCP, DHCP, DNS, NTP, SMTP, POP3, MIME, HTTP, FTP and TELNET
- Security protocols: SSL3/TLS1, HTTPS, FTPS, RSA, AES-128/256, 3DES, RC-4, SHA-1, MD-5, WEP, WPA/WPA2 (PSK and Enterprise)
- Protocols accelerated in hardware: AES, 3DES and SHA

### Application Program Interface:

- AT+i protocol for Internet Controller mode
- SerialNET mode for transparent serial data-to-Internet bridging
- LAN-WiFi transparent bridging
- PPP operation mode for Modem-WiFi conversion
- LAN↔WiFi; WiFi↔Cellular; LAN↔Cellular Routing

### Warranty:

One year

### Certifications: (Pending Approvals)

- **Radio & EMC:**
  - **USA**
    - FCC Modular Approval
    - CFR Title 47 FCC Part 15, Subpart B and C
  - **Canada**
    - Industry Canada Module Approval
    - Industry Canada ICES-003, RSS-Gen, RSS-210
  - **EU**
    - EN 300 328 (R&TTE Directive 1999/5/EC)
    - EN 301 489 (EMC Directive 2004/108/EC)
- **Safety:**
  - UL 60950
  - CAN/CSA-C22.2 No. 60950
  - EN 60950, Low Voltage Directive (2006/95/EC)

### Installation Requirements:

The Nano WiReach MAX-SMT must be installed within a full-enclosure device that is safety certified.

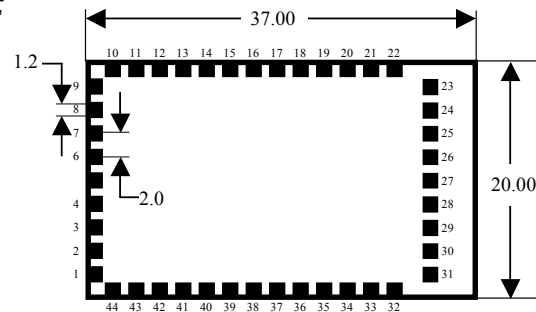
### Pin Assignments:

Pin	Signal	Type	Description
1	GND	PWR	POWER
2	HDM	ANA	USB HOST
3	HDP	ANA	USB HOST
4	RESET	In	ACCESSORY
5	PIOC4	I/O	ACCESSORY
6	MSEL	In	ACCESSORY
7	DATARDY/ PIOC25	Out	ACCESSORY
8	ETXEN	Out	RMII
9	REFCLK	In	RMII
10	ETX0	Out	RMII
11	ETX1	Out	RMII
12	CRSDV	In	RMII
13	ERXD0	In	RMII
14	ERXD1	In	RMII
15	ERXER	In	RMII
16	EMDC	Out	RMII
17	EMDIO	I/O	RMII
18	PIOC5	I/O	ACCESSORY
19	VBUS	Out	ACCESSORY
20	READINESS/ PIOC2	Out	ACCESSORY
21	PIOC3	I/O	ACCESSORY
22	VDD	PWR	POWER

Pin	Signal	Type	Description
23	GND	PWR	POWER
24	GND	PWR	POWER
25	GND	PWR	POWER
26	GND	PWR	POWER
27	GND	PWR	POWER
28	GND	PWR	POWER
29	GND	PWR	POWER
30	GND	PWR	POWER
31	GND	PWR	POWER
32	RF_LED	Out	ACCESSORY
33	ACH	ANA	A/D Input
34	SPI1_CLK	In	SPI4
35	SPI1_CS	In	SPI3
36	SPI1_MISO	Out	SPI1
37	SPI1_MOSI	In	SPI2
38	SPI1INT/ PIOC0	Out	ACCESSORY
39	TXD0	Out	UART3
40	RXD0	In	UART2
41	CTS0	In	UART1
42	RTS0	Out	UART0
43	DDM	ANA	USB DEVICE
44	DDP	ANA	USB DEVICE

### Bottom Side Mechanical View:

All measurements are in millimeters:



Ordering Information	
Part Number	Description
iW- SM2144SMT-N-EX-C	Nano WiReach MAX-SMT module, External Antenna, Commercial temperature range
iW- SM2144SMT-N-OB-C	Nano WiReach MAX-SMT module, On-Board Antenna, Commercial temperature range
iW- SM2144SMT-N-EX-I	Nano WiReach MAX-SMT module, External Antenna, Industrial temperature range
iW- SM2144SMT-N-OB-I	Nano WiReach MAX-SMT module, On-Board Antenna, Industrial temperature range
II-EVB-365N	Evaluation board for Nano WiReach MAX-SMT module, On-Board Antenna
iW-CAB-150	Miniature coaxial pigtail cable. U.FL-SMA connectors. 150mm length.
iW-ANT2-BL	2.4GHz WiFi antenna, 2.0dBi, 50Ω, omni-directional, 1/4 wavelength dipole configuration

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