



NW1000™ Data Sheet

revision 0.2

1) Device description:

The NW1000™ radio module is a highly integrated, cost-effective, Smart Radio, sub-1 GHz wireless node solution composed of a transceiver which uses DBPSK modulation, with a low-power ARM® Cortex M3 CPU. The highly integrated RF transceiver operates on a wide range of frequency, including: 315MHz, 433MHz, 470MHz, 868MHz, 915MHz in the license-free Industrial, Scientific & Medical (ISM) frequency bands. This configuration allows users to minimize the use of external components.

Key benefits:

- Best radio modem for smart metering.
- 10 miles in harsh city environment.
- 20 years on AA battery.
- NWave™ proprietary radio protocol.
- FCC compliant.
- UNB resulting in small antennas.
- Low power without sacrificing link budget.
- Ultra low power wake-on-radio mode.
- Option to embed user's firmware into modules MCU.
- Data rate: 100bps via NWave™ proprietary protocol.

Applications:

- Automated Meter Reading.
- Wireless Sensor Networks.
- Home and Building Automation.
- Wireless Alarm and Security Systems.
- Industrial Monitoring and Control.

Host interface:

- Absolute maximum voltage on I/O pin: +4V.
Interface is not 5V tolerant.
- 10 General Purpose I/O pins.
- Configurable: Push - Pull, Open Drain, Pull-up/Pull-down, input filter, drive strength.
- Pin Interrupt.
- Output state retention & Wake-up from Shut-down Mode.
- LVTTL (+3.3V logic) simple Low energy UART interface.
- AT commands are used to communicate between host and NWRM1000 module.

General parameters:

- Surface mount, 22x16x4mm, land grid array (LGA) packaging.
- Operating temperature range: between -40 degree C to +85 degree C
- Single supply voltage: +3.3V to +3.8V.

Radio interface parameters:

- Output power range: **-10dBm to 16dBm**.
- Output power regulation in **0.5dB** steps.
- Adjacent channel power: **-50dBc**.
- Wireless M-Bus support.
- Customer configure power output.
- Customer configured frequency.
- Customer configured working channel.

Power consumption:

- During broadcast: **22mA @ 10dBm** or **54mA @ 15dBm**.
- Sleep mode with RAM retention and wake-up timer running at **1.5 µA**.

Built-in microcontroller:

- ARM Cortex-M3, 32-bit CPU platform.
- Wake-up Interrupt Controller.
- 32.768 kHz Crystal Oscillator.

Programming/debugging interface:

- 2 wire Serial Debug Interface.

Device memory size:

- Total size of Flash: 128kB.
- Total size of RAM: 16kB.
- Memory occupied by NWave firmware: ??kB
- Memory available for customer application: ??kB

2) Host - module interface description:

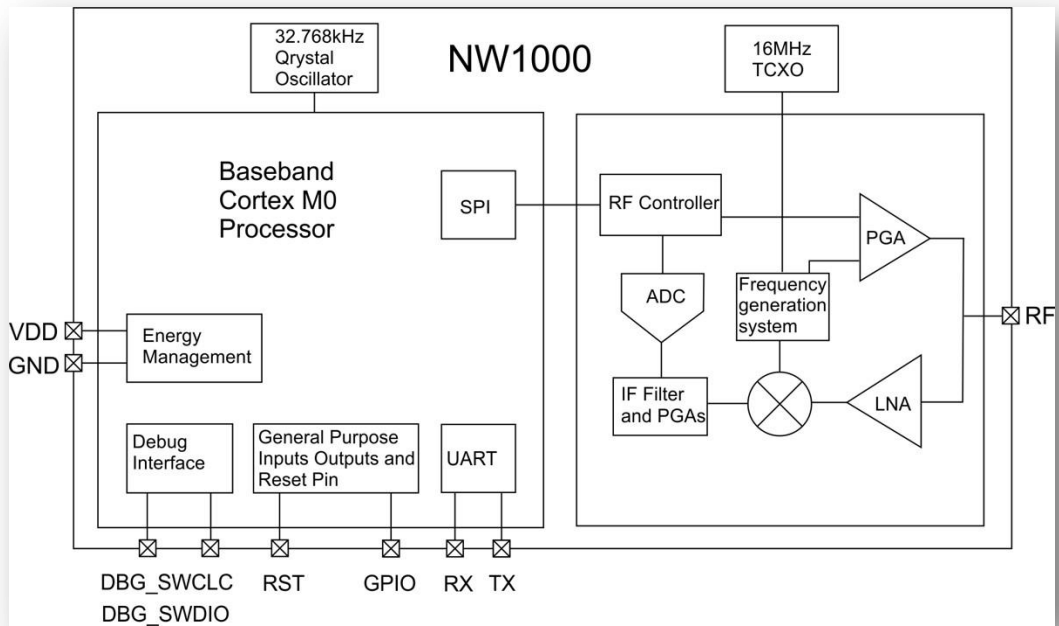
The NW1000 communicates with the host MCU over a UART interface RX, TX pins.

Host MCU can use set of AT commands to set the carrier frequency of NW1000 & send data to the NWave Network.

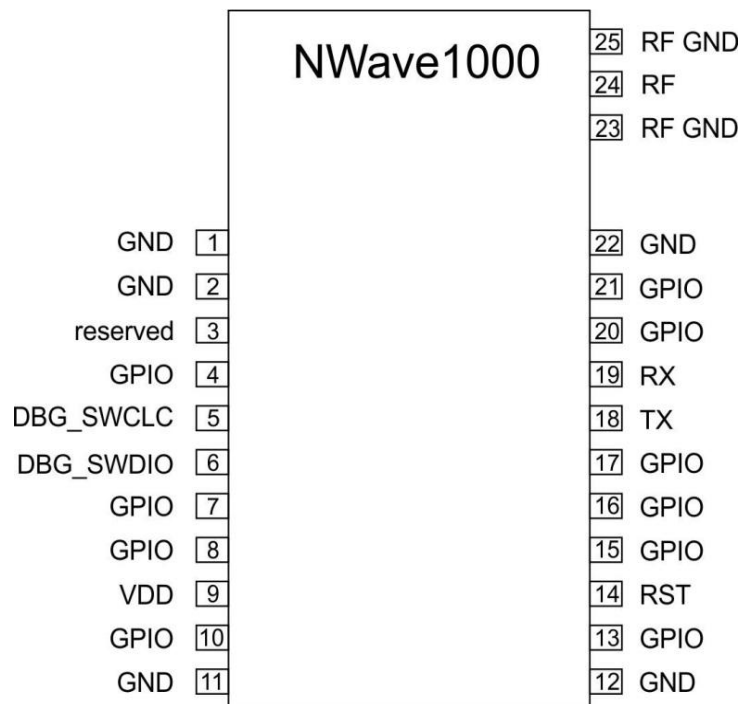
The serial interface is designed to operate using serial protocol parameters:

LVTTL (+3.3V logic), 9600 bps, 8 data bits, 1 stop bit, no parity.

3) NW1000™ Functional Block Diagram



4) NW1000™ Pin-out:



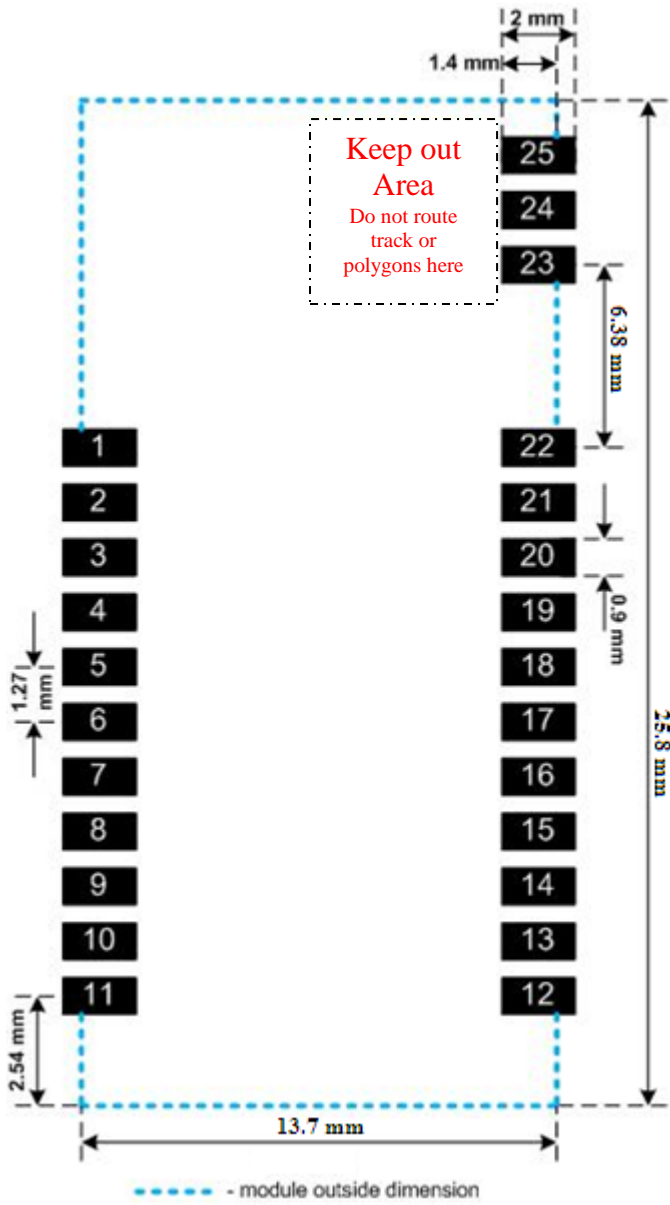
5) NW1000™ Pin-out description:

Pin #:	Symbol:	Description:	Available alternate functions:
1	GND	Ground	
2	GND	Ground	
3	reserved	Do not connect	
4	GPIO	I/O port	ACMP1C6 - analog comparator 1 input 6
5	DBG_SWCLC	Debug interface, clock line	
6	DBG_SWDIO	Debug interface, data line	
7	GPIO	I/O port	SDA - I2C data line / Timer 0 Capture Compare Input 0
8	GPIO	I/O port	SCL - I2C clock line / Timer 0 Capture Compare Input 1 / Clock Management Unit, clock output 1
9	VDD	+3.3V power supply input	
10	GPIO	I/O port	ADC0 - ADC input 0 / PCNT0 - Pulse Counter input 0
11	GND	Ground	
12	GND	Ground	
13	GPIO	I/O port	ADC1 - ADC input 1 / PCNT1 - Pulse Counter input 1
14	RST	Reset input, active low	
15	GPIO	I/O port	DAC0 - DAC output / LETIM0 - output channel 0
16	GPIO	I/O port	
17	GPIO	I/O port	ACMP1C7 - analog comparator 1 input 7
18	Tx	Low Energy UART0 output	
19	Rx	Low Energy UART0 input	
20	GPIO	I/O port	ADC0 - ADC input 6 / LETIM0 - output channel 0
21	GPIO	I/O port	ADC0 - ADC input 7 / LETIM0 - output channel 1
22	GND	Ground	
23	RF GND	RF Ground	
24	RF	Aerial (Antenna) connection pin	
25	RF GND	RF Ground	

6) Mechanical dimension & PCB pads layout:

All dimensions in millimeters.

Top side view.



7) List of available AT commands for host - module communication: