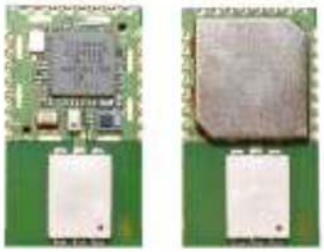
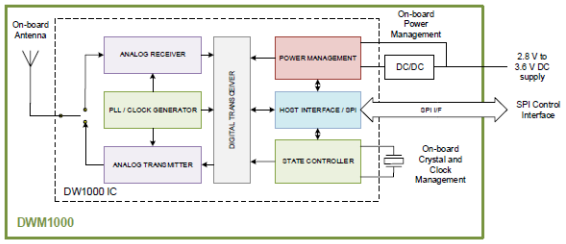
INSCRIPTION MANUAL [DWM 1000]





High Level Block Diagram

The DWM 1000 module is based on Decawave's DW 1000 Ultra Wideband (UWB) transceiver IC. It integrates antenna, all RF circuitry, power management and clock circuitry in one module. It can be used in 2-way ranging or TDOA location systems to locate assets to a precision of 10cm and supports data rates of up to 6.8 Mbps

Key Features

IEEE 802.15.4-2011 UWB compliant

Supports 4 RF bands from 3.5GHz to 6.5 GHz

Programmable transmitter output power

Fully coherent receiver for maximum range and accuracy

Designed to comply with FCC & ETSI UWB spectral masks

Supply voltage 2.8V to 3.6V

Low power consumption

Data rates of 110 kbps, 850 kbps, 6.8 Mbps

Maximum packet length of 1023 bytes for high data throughput applications

Integrated MAC support features

Supports 2-way ranging and TDOA

SPI interface to host processor

23mm x 13mm x 2.9 mm 24pin side castellation package

Key Benefits

Simplifies integration, no RF design required

Very precise location of tagged objects delivers enterprise efficiency gains and cost reductions

Extended communications range minimizes required infrastructure in RTLS

High multipath fading immunity

Supports very high tag densities in RTLS

Low cost allows cost-effective implementation of solutions

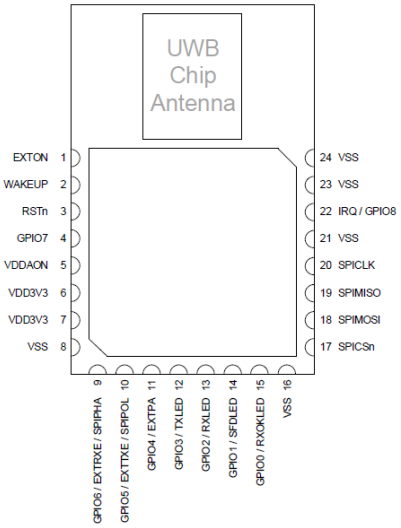
Low power consumption reduces the need to replace batteries and lowers system lifetime costs

Applications

Precision real time location systems (RTLS) using two-way ranging or TDOA schemes in a variety of markets.

Location aware wireless sensor networks (WSNs)

Pin Map Information



SIGNAL NAME	PIN	I/O (Default)	DESCRIPTION
Digital Interface			
SPICLK	20	DI	SPI clock
SPIMISO	19	DO (D-L)	SPI data output.
SPIMOSI	18	DI	SPI data input.
SPICSn	17	DI	SPI chip select. This is an active low enable input. The high-to-low transition on SPICSn signals the start of a new SPI transaction.
WAKEUP	2	DIO	When asserted into its active high state the WAKEUP pin brings the DW1000 out of SLEEP or DEPPSLEEP states into operational mode. If unused, this pin can be tied to ground.
EXTON	1	DO (O-L)	External device enable. Asserted during wake up process and held active until device enters sleep mode. Can be used to control external DC-DC converters or other circuits that are not required when the device is in sleep mode so as to minimize power consumption.
IRQ/GPIO8	22	DIO (O-L)	Interrupt Request output from the DWM1000 to the host processor. By default IRQ is an active-high output but may be configured to be active low if required. For correct operation in SLEEP and DEPPSLEEP modes it should be configured for active high operation. This pin will float in SLEEP and DEEPSLEEP states and may cause spurious

SIGNAL NAME	PIN	I/O (Default)	DESCRIPTION
			interrupts unless pulled low. When the IRQ functionality is not being used the pin may be reconfigured as a general purpose I/O line, GPIO8.
GPIO7	4	DIO (I)	Defaults to operate as a SYNC input. THIS FUNCTIONALITY IS NOT APPLICABLE TO THE DWM1000. This pin may be reconfigured as a general purpose I/O pin, GPIO7 under software control.
GPIO6/SPIPHA	9	DIO(I)	General purpose I/O pin. On power-up it acts as the SPIPHA (SPI phase selection) pin for configuring the SPI mode of operation. After power-up, the pin will default to a General Purpose I/O pin.
GPIO5/SPIPOL	10	DIO (I)	General purpose I/O pin. On power-up it acts as the SPIPOL (SPI phase selection) pin for configuring the SPI operation mode. After power-up, the pin will default to a General Purpose I/O pin.
GPIO4	11	DIO(I)	General purpose I/O pin.
GPIO3/TXLED	12	DIO(I)	General purpose I/O pin. It may be configured for use as a TXLED driving pin that can be used to light a LED following a transmission.
GPIO2/RXLED	13	DIO(I)	General purpose I/O pin. It may be configured for use as a RXLED driving pin that can be used to light a LED during receive mode.
GPIO1/SFDLED	14	DIO(I)	General purpose I/O pin. It may be configured for use as a SFDLED driving pin that can be used to light a LED when SFD (Start Frame Delimiter) is found by the receiver.
GPIO0/RXOKLED	15	DIO(I)	General purpose I/O pin. It may be configured for use as a RXOKLED driving pin that can be used to light a LED on reception of a good frame.
RSTn	3	DIO(O-H)	Reset pin. Active Low Output. May be pulled low by external open drain driver to reset the DW1000.
Power Supplies			
VDDAON	5	P	External supply for the Always-On (AON) portion of the chip.
VDD3V3	6,7	P	3.3V supply pins. Note that for programming the

SIGNAL NAME	PIN	I/O (Default)	DESCRIPTION
			OTP in the DWM1000 module this voltage may be increased to a nominal value of 3.8 V for short periods.
Ground			
GND	8,16,21, 23,24	G	Common ground.

Manual Information to the End User:

• The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

OEM Responsibilities to comply with FCC Regulations

The (your product name) Module has been certified for integration into products only by OEM integrators under the following conditions:

1. The antenna(s) must be installed such that a minimum separation distance of 5mm is maintained between the radiator (antenna) and all persons at all times.
2. The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter.

As long as the two conditions above are met, further transmitter testing will not be required. However, the OEM in¬tegrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions cannot be met (for certain configurations or co-location with another transmitter), then the FCC authorizations are no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

This modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.
If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuity), then the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Host labelling guidance for the end integrator

This is an advise for host manufacture to provide a physical / e-label on their host product stating, "Contains FCC ID: 2AV3X-TT001":
A permanently affixed label must be used. The modular transmitter must be labeled with its own FCC identification number, and, if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the
module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: 2AV3X-TT001" or "Contains FCC ID: 2AV3X-TT001". Any similar wording that expresses the same meaning may be used.

Compliance Statement
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Warning
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF Exposure
This portable transmitter with its antenna complies with FCC RF exposure limits for general population / uncontrolled exposure.

FCC ID: 2AV3X-TT001