

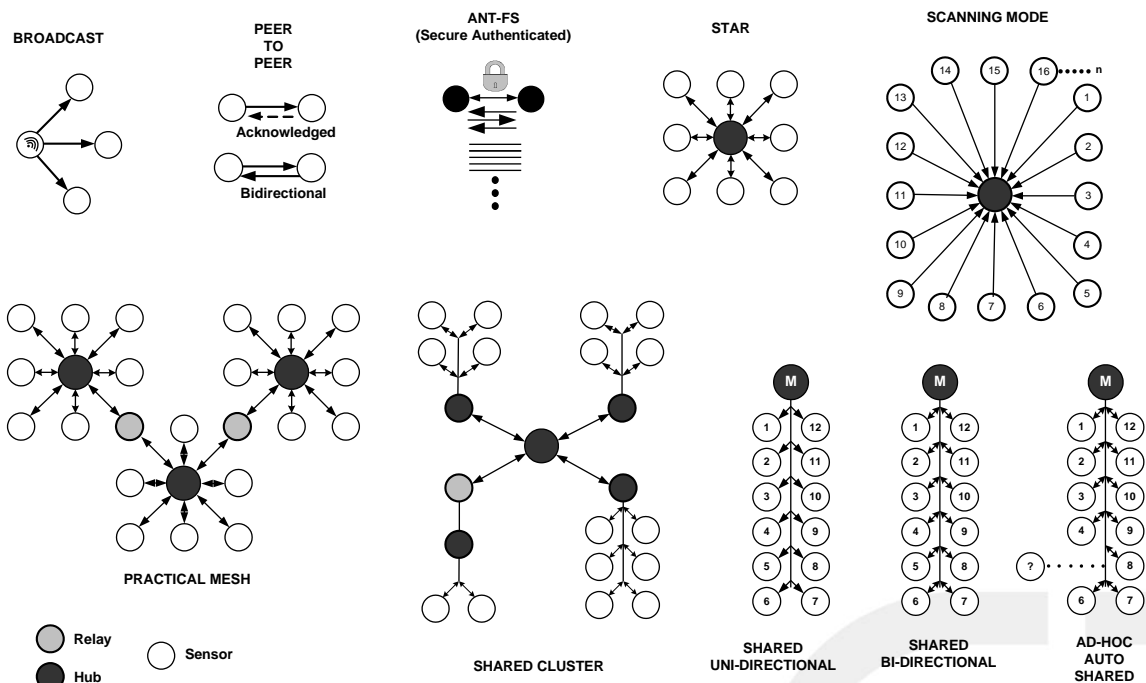
# ANT USB2 Stick

## FEATURES

- 2403 to 2480MHz worldwide ISM band
- 78 selectable RF channel
- 59 x 18 x 8 mm
- ANT channel combined message rate up to 190Hz (8byte data payload)
- Minimum message rate per ANT channel 0.5Hz
- Burst transfer rate up to 20Kbps (true data throughput)
- Up to 8 ANT channels
- Up to 3 public, managed and/or private network keys
- 1 Mbps RF data rate, GFSK modulation
- 2<sup>nd</sup> generation ANT feature enhancements
- 15°C to +70°C operating temperature
- Type A USB connector
- WHQL certified Windows driver
- No driver installation is required on Mac OS X machines
- ANT library files for applications development
- Radio regulatory approval for major markets
- RoHS compliant



## ANT NETWORK CONFIGURATIONS



**D00001367 Rev1.4**

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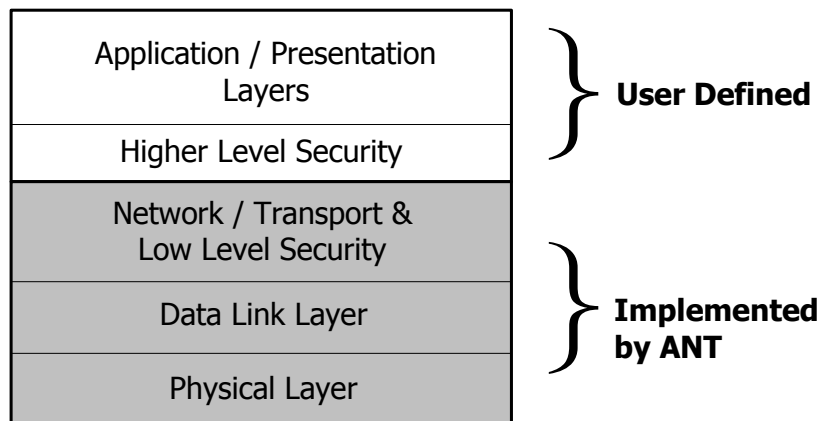
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## ANT™ Overview

ANT™ is a practical wireless sensor network protocol running on 2.4 GHz ISM band. Designed for ultra low power, ease of use, efficiency and scalability, ANT easily handles peer-to-peer, star, tree and practical mesh topologies. ANT provides reliable data communications, flexible and adaptive network operation and cross-talk immunity. The protocol stack of ANT is extremely compact, requiring minimal microcontroller resources and considerably reducing system costs.

ANT provides carefree handling of the Physical, Network, and Transport OSI layers. In addition, it incorporates key low-level security features that form the foundation for user-defined, sophisticated, network-security implementations. ANT ensures adequate user control while considerably lightening computational burden in providing a simple yet effective wireless networking solution.



**ANT supports public, managed and private network architectures with  $2^{32}$  uniquely addressable devices possible**, ensuring that each device can be uniquely identified from each other in the same network.

ANT is proven with an installed base of over four million nodes in ultra low power sensor network applications in sport, fitness, home and industrial automation. The ANT solutions are available in chips, chipsets and modules to suit a wide variety of application needs.

### 2<sup>nd</sup> generation ANT core stack enhancements:

- Background scanning
- Continuous scanning mode
- High density node support
- Improved channel search
- Channel ID management
- Improved transmission power control
- Frequency agility
- Proximity acquisition

The complete description of ANT message protocol is found in the document "ANT Message Protocol and Usage". The serial interface details are provided in the document "Interfacing with ANT General Purpose Chipsets and Modules". Both documents are available on [www.thisisant.com](http://www.thisisant.com).

### ANT+ and ANT+ Alliance

ANT+ is the open application layer on the top of the ANT stack. It standardizes communications and facilitates interoperability between a wide array of personal sports, wellness and lifestyle monitoring devices. ANT+ defines device profiles that specify access, data formats, and channel parameters.

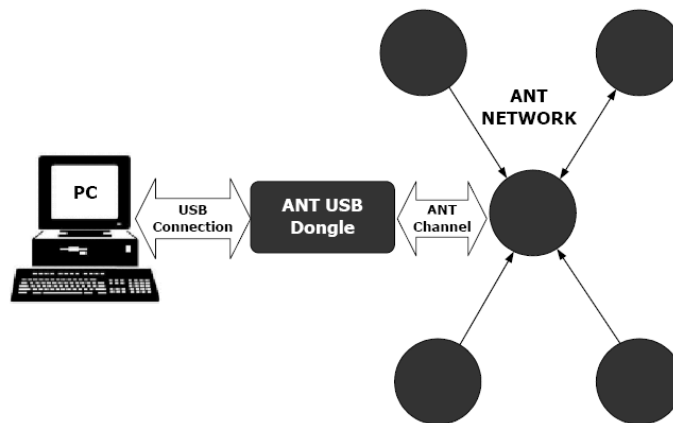
The ANT+ Alliance is comprised of companies who have adopted the ANT+ promise of interoperability. The Alliance ensures standardized communication through optimized brand value and partnerships with other top tier companies and products.

## 1. ANT USB2 Stick

The USB stick is a computer dongle that provides a quick and easy solution for Windows PC or Mac USB connectivity to ANT wireless networks. Applications running on computers often perform as the hub node of a network through the ANT USB stick to receive, store, analyze and display data collected from ANT sensors or other wearable or portable hub devices such as a watch and a bike computer. The application may also serve as the gateway to the Internet for cloud computing. The USB2 is the second generation USB Stick and uses the Nordic Semiconductor's single chip implementation that provides full transceiver operation with 8 independent physical ANT channels.

This ANT offering is supported by a set of Windows PC and MAC OS drivers and a software library that provides application level interface to ANT functions. The accompanying software available from Dynastream includes sample application code that dramatically reduces the time required for connecting a computer to an ANT sensor network.

Operating in the globally available ISM radio frequency band of 2.4GHz, the ANT USB2 stick conforms to multinational RF regulatory standards, allowing the same product line to be sold and used in North America, Europe, and Asia, without modification.



### 1.1 Drivers

Drivers are required for the ANT USB2 stick.

- Windows XP, Vista, 7 and 8 (Except for Windows RT)

The Windows driver has been WHQL (Windows Hardware Quality Labs) certified and listed on windows updates. This allows the automatic driver installation, when the computer is connected to the internet, without special configuration or UAC (User Account Control) prompts.

The driver is also available from [www.thisisant.com](http://www.thisisant.com).

- Mac OS X10 and above

ANT USB2 is designed to work with Apple's I/O Kit framework. No additional driver installation is required on Mac OS X machines.

- Android 3.1 and above

The ANT USB Service and ANT Radio Service are freely available from play.google.com. The Android phone or tablet needs to support USB host feature, and for some, an USB socket converter or an USB OTG (On-The-Go) cable is required.

## 1.2 ANT library

ANT library packages are provided for development in several languages, including C++ for Windows and Mac, .Net library for Windows, and Java for Android. ANT library packages are accessible from [www.thisisant.com](http://www.thisisant.com) upon the acceptance of the ANT+ adopter agreement. The usage of the Windows and Mac OS X library package is governed by ANT+ Shared Source License. The usage of the Android SDK package is governed by the Apache 2.0 license.

For detailed ANT feature description and message usage, please refer to "ANT Message Protocol and Usage"

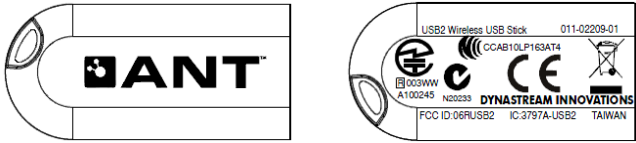
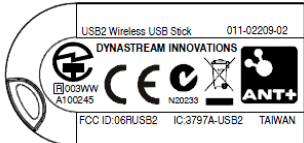
## 1.3 VID, PID and Other Descriptors

The ANT USB2 stick is loaded with default VID and PID values to allow working with the drivers and libraries. The default VID, PID and other default descriptor values are listed below.

Descriptors	Default Value
VID	0x0FCF
PID	0x1008
Manufacturer String	Dynastream Innovations
Device String	ANT USBStick2

## 1.4 Product Model and Brand

The ANT USB2 stick is released with two branding varieties, ANT branded (USB2 stick -ANT) or unbranded with ANT+ stamp (USB2 stick – OEM).

Model	Printings on USB Housing
USB2 Stick – ANT (Discontinued October, 2013)	
USB2 Stick - OEM	 No printings on the other side

The USB2 stick – OEM is for customers to print their own logo on one side of the USB stick. Please be noted **that the customization is limited to logo printings only. Any design changes, mechanically or electrically, will violate some or all of the RF regulatory approvals.**

## 2. Regulatory Approval

The ANT USB2 stick has received regulatory approvals in the United States (FCC), Canada (IC), Europe (ETSI), Japan (ARIB), Russia, Australia, New Zealand and Taiwan.

### 2.1 United States

The ANT USB2 stick has been tested and found to comply with Part 15 of the FCC interference limits for Class B and class C devices. Operation is subject to the following two (2) 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.

This equipment generates, uses and can radiate radio frequency energy and may cause harmful interference to radio communications if not installed and used in accordance with the instructions. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet that is on a different circuit from the receiver.
- Consult the dealer or an experienced radio/TV technician for help.

This product does not contain any user-serviceable parts. Unauthorized repairs or modifications could result in permanent damage to the equipment, and void your warranty and your authority to operate this device under Part 15 regulations.

The USB2 dongle is marked with "FCC ID: O6RUSB2" (note: First Character is the letter O, not the # 0.)

### 2.2 Industry Canada Compliance

The ANT USB2 stick has been certified for use in Canada under Industry Canada (IC) Radio standards Specification (RSS) RSS-210. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The USB2 dongle is marked with "IC: 3797A-USB2"

### 2.3 CE Declaration of Conformity

The ANT USB2 stick is declared to be in conformance with the essential requirements and other relevant provisions of 1999/5/EC and 2006/95/EC, as a low-powered unlicensed transmitter:

- EN 60950-1:2006 Safety of Information Technology Equipment
- EN 300 440-1 v1.4.1:2008, EN 300 440-2 v1.2.1:2008 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short range devices
- EN 301 489-3 v1.4.1: 2002 Electromagnetic compatibility and Radio spectrum Matters; Electro Magnetic Compatibility standard for radio equipment and services
- EN301 489-1 v1.8.1: 2008 ERM; Electro Magnetic Compatibility (EMC); Standard for Radio Equipment and Services
- EN55022: 2006+A1:2007, Class B Information technology equipment - Radio disturbance characteristics



- EN61000-4-2:1995+A1: 1998+A2:2001 Electrostatic Discharge Immunity
- EN61000-4-3: 2006+A1: 2008 Radiated Radio-Frequency Electromagnetic Field Immunity

## **2.4 Japan**

The ANT USB2 stick has been granted type certificate (certified number 003WWA100245) in accordance with the provisions of Article 38-24, Paragraph 1 of the Radio Law, in the classification of Article 2-1-19.

## **2.5 Australia & New Zealand**

The ANT USB2 stick has been tested and found to comply with AS/NZS 4268:2003, Radio equipment and systems – Short range devices.

## **2.6 Russia**

The ANT USB2 stick has been tested and found to comply with Russian safety standards GOST-R.

## **2.7 China**

The ANT USB2 stick has been tested and received Type Approval Certificate from China for low power radio transmission equipment. CMIIT ID: 2012DJ2205. Validity period: 5 years from April 19, 2012.

## **2.8 Taiwan**

The ANT USB2 stick has been tested and found to comply with Taiwan low power radio technical standard.

### 3. Specifications

#### 3.1 Mechanical

Item	Specification	Notes
PCBA Size	50.6 x 13.8 mm x 4.5 mm	Include USB connector
Full Product Size	61 x 18 x 8.6 mm	Include USB connector
Product weight	8.5 g	Include housing
USB Connector	Type A	
Housing	Molded in ABS; removable USB connector cap	
Color	Black	

#### 3.2 Environmental

Item	Specification	Comments
Storage temperature	-40°C to +70°C	
Operational temperature	-15°C to +70°C	
Drop resistant	Survives with full functionality after 6 drops from 1 m onto concrete	Plastic may scratch, but not crack. Functionality is fully intact
Impact resistant	Survives impacts associated with typical PC Dongle – rough usage	

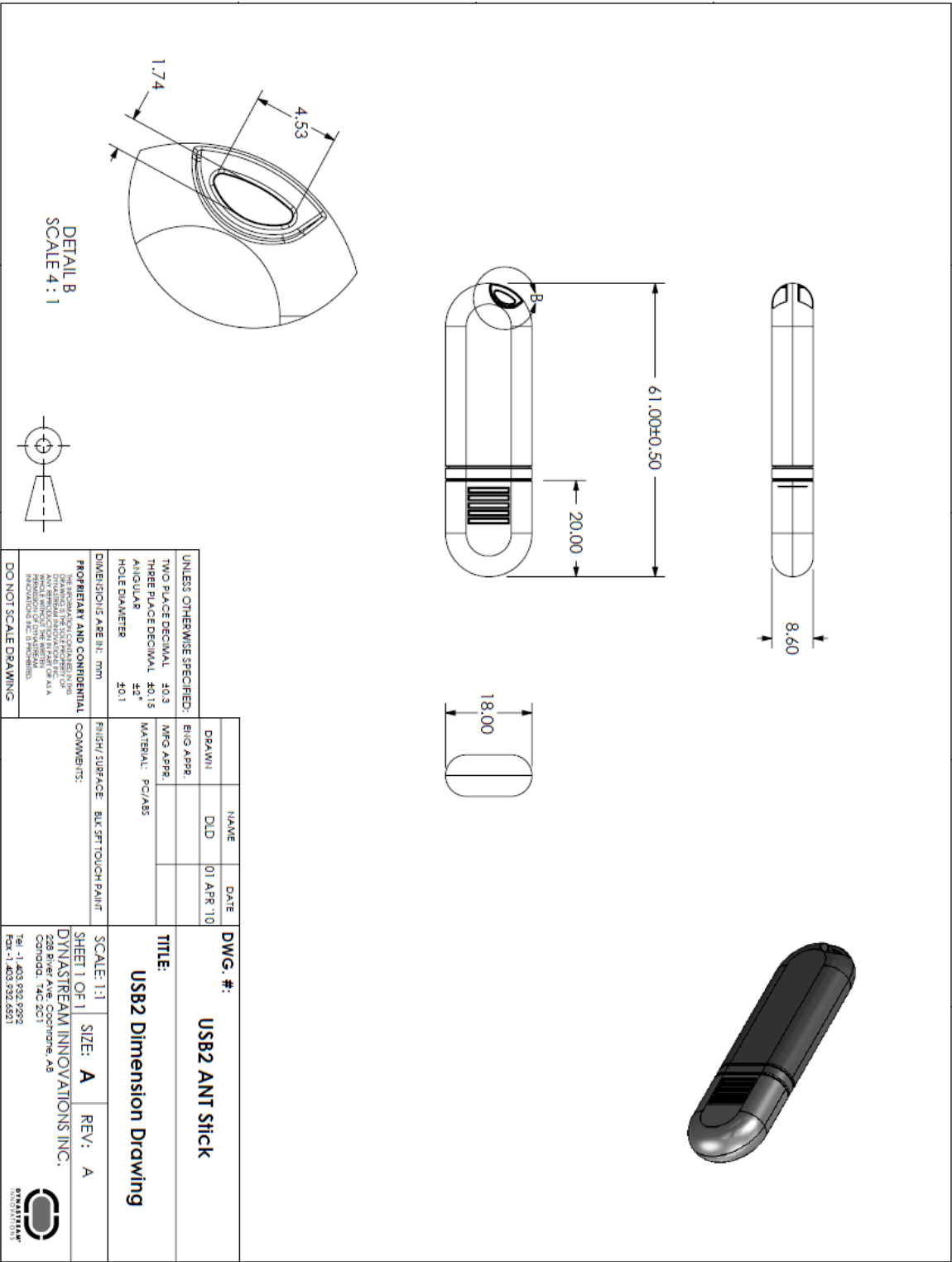
#### 3.3 Electrical

Element	Specification	Comments
Power Source	PC USB interface (5 volts nominal)	
Operating Voltage	4.75V to 5.25V	
Idle Current	11mA maximum	
Suspend Current	2mA	
Max. Current	30mA	For example, in scanning mode

### 3.4 RF Communications

Element	Specification	Comments
RF Frequency Band	2403 – 2480 MHz	
Peak TX Power	Maximum output power 4dBm	
Average EIRP	-3dBm +/-4dBm	
Antenna Gain	0 – 2 dBi	
Antenna Directivity	3dBi typical	
Band Edge Power	-40dBm maximum (AU/NZ specification)	
Harmonics Power	-40dBm maximum (AU/NZ specification)	
Communication Range	Typical 5-10m	Depending on specific environment and receivers.

4. Mechanical Drawings



## 5. Support

Users can seek application support from Dynastream Innovations, [www.thisisant.com](http://www.thisisant.com).

### 5.1 ANT Forum

Users are encouraged to participate in the ANT forum moderated by the application engineering team of Dynastream Innovations for any engineering discussions. Joining the ANT forum is free and open at [www.thisisant.com/antforum](http://www.thisisant.com/antforum).

### 5.2 Public Technical References

Documents:

1. ANT Message Protocol and Usage

Software:

2. Driver Windows XP, Vista, 7 and 8
3. ANT library package for windows
4. ANT library package for Mac OS X
5. ANTwareII – a system testing and debugging tool

The above documents and software are available at <http://dynastream.com/developer/antusb2-stick>.

### 5.3 ANT Developer's Zone

ANT development software tools, application notes, reference designs and other public resources are found in the ANT developer's zone at <http://www.thisisant.com/developer>.

To begin development with the ANT+ interoperability, please become an [ANT+ Adopter or ANT+ Alliance member](#) to obtain the access to the ANT+ Adopter Zone. ANT+ documents and design tools contained in the ANT+ Adopter zone include the ANT+ Device Profiles, ANT-FS specification, ANT software (PC/Mac) libraries with source codes, and embedded reference designs with source codes.

### 5.4 ANT Social Media

ANT is on the following social media,

YouTube: <http://www.youtube.com/user/ANTAlliance>

Twitter: <http://twitter.com/ANTPlus>

Facebook: <https://www.facebook.com/thisisant>

LinkedIn: <http://www.linkedin.com/groups?gid=1379137>