

ANTUSB-m Stick

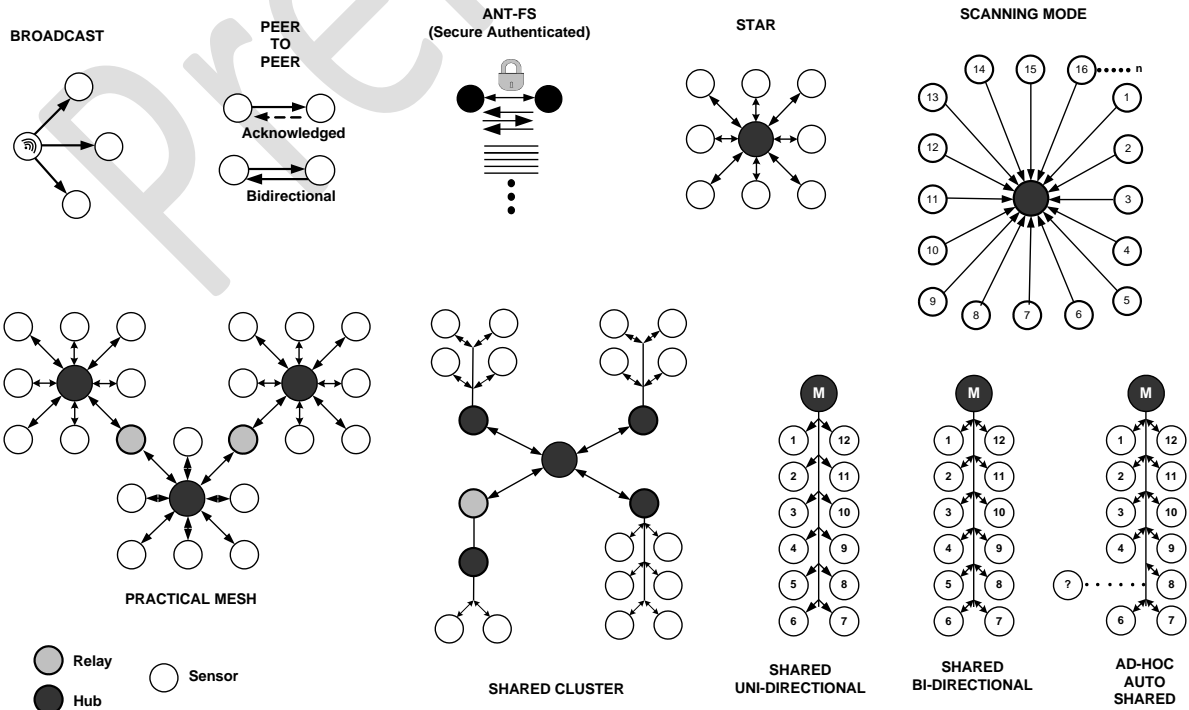
FEATURES

- 78 selectable RF channels in 2403 to 2480MHz ISM band
- ANT channel combined message rate up to 190Hz (8byte data payload)
- Minimum message rate per ANT channel 0.5Hz
- Burst transfer rate up to 60Kbps (true data throughput)*
- Up to 8 ANT channels
- Up to 8 public, managed and/or private network keys*
- Encrypted data channel*
- High duty search and active search sharing*
- WHQL certified Windows driver
- No driver installation is required on Mac OS X machines
- Support on device using Android 3.1 or later and having USB host enabled
- ANT library files for applications development
- Supports USB 1.1/2.0 Full Speed specification with Type A USB connector
- Radio regulatory approval for major markets
- -10°C to +50°C operating temperature
- 18.96 x 12.48 x 5.02 mm
- RoHS compliant



* Enhancements in the new generation ANT core stack

ANT NETWORK CONFIGURATIONS



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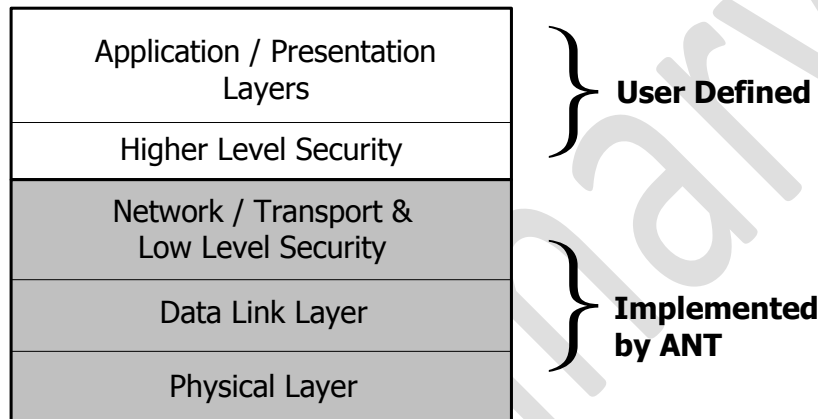
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ANT™ Overview

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.

Enhancements in this new generation ANT core stack:

- Fast data burst up to 60 bps (true data throughput)
- Encrypted data channel
- Up to 8 ANT network keys
- High duty search and active search sharing

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.

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.

Preliminary

1. ANTUSB-m

The ANTUSB-m is a USB dongle that provides a quick and easy solution for Windows PC, Mac and Android equipment with an USB type A port to ANT wireless networks. Applications running on these computers or equipment 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 ANTUSB-m is a miniature design. When plugging in, the majority of the body is buried inside the computer or equipment.

The ANTUSB-m includes many new feature enhancements of ANT.

- Fast data burst up to 60 kbps (true data throughput)
- Encrypted data channel
- Up to 8 ANT network keys
- High duty search and active search sharing

These enhancements will deliver a better user experience on data downloading, private and secure data transfer, and connectivity with multiple devices. For detailed description and usage of these ANT enhancements, as well as of many other new features, please refer to "ANT Message Protocol and Usage".

The ANTUSB-m offering is supported by a set of Windows, MAC and Android 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 reduce 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 ANTUSB-m 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 ANTUSB-m

- Windows XP, Vista, 7 and above

The Windows drivers have been WHQL (Windows Hardware Quality Labs) certified and listed on windows updates. This allows the automatic driver install 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.

- Mac OS X10 and above

ANTUSB-m 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 is available from play.google.com for phones supporting USB Host feature.

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 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 Product Model and Brand

The ANTUSB-m stick is released in black color, unbranded and with a special ANT+ figure mark on the front. The top side is left blank for customers to print or apply a sticker of their own logos or brand names.

Dynastream offers product customization for volume customers at a cost. The customization includes the choice of white color and logo or brand printing on top or front. Please contact Dynastream directly for such request.

1.3.1 Top Logo Area

The top logo area of the USB-m is one of the options for printing. The surface is curved near the end of the stick, but any distortion of a flat image will be too small to make out under visual inspection

The dimensions for a logo are:

Width: 11mm

Height: 7.1mm for a flat image projected onto the surface (7.3mm after projecting)



Figure 1 Top Logo Area using ANT+ Logo for Illustration

The curvature of the surface is larger near the end of the ANTUSB-m. So this is the area where any stretching of the image will occur.

The bottom corners do have a large fillet on them (approximately 1.9mm in radius). As such, any logos must take this into account if it is desired to have the logo off center.

1.3.2 Front Logo Area

The end logo area is the second location available for branding. It is a gently curved surface facing directly out when installed in a standard USB port.



Figure 2 Front Logo Area Using ANT+ Figure for Illustration

The dimensions for a logo are: 10.2mm x 3.5mm

The Fillets on the edge can cause some distortion to the image as they “curl away” from the main printing location. This distortion will not be visible to the naked eye. As well, objects that extend too far around the corner cannot be printed.

Preliminary

2. Regulatory Approval **(not completed on the date of this document)**

The ANTUSB-m has received regulatory approvals in the United States (FCC), Canada (IC), Europe (ETSI), Japan (ARIB), Australia and New Zealand, China and Russia.

2.1 United States

The ANTUSB-m 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 ANTUSB-m dongle is marked with "FCC ID: O6R2021" (note: First Character is the letter O, not the # 0.)

2.2 Industry Canada Compliance

The ANTUSB-m complies with Industry Canada licence-exempt RSS standard(s). 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.

(Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.)

The ANTUSB-M dongle is marked with "IC: 3797A-2021"

2.3 CE Declaration of Conformity

The ANTUSB-m 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 ANTUSB-m has been granted type certificate (certificate number 203-JN6016) 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 ANTUSB-m has been tested and found to comply with AS/NZS 4268:2003, Radio equipment and systems – Short range devices.

2.6 Russia

The ANTUSB-m has been tested and found to comply with Russian safety standards GOST-R.

2.7 China

The ANTUSB-m has been tested and received Type Approval Certificate from China for low power radio transmission equipment. **CMIIT ID: ...**

3. Specifications

3.1 Mechanical

Item	Specification	Notes
Full Product Size	L 19.0 ± 0.3mm x W 12.4 ± 0.3mm x H 5.3 ± 0.3mm	
Product weight	<5g	
USB Connector	Type A	
Contact Durability	Rated for 400 insertions into USB port	
Housing	PC/ABS plastic and stainless steel	
Color	Black or White	

3.2 Environmental

Item	Specification	Comments
Storage temperature	-40°C to +70°C	
Operational temperature	-10°C to +50°C	
Drop resistant	Survives with full functionality after 1 m on all 6 sides onto concrete surface	Cosmetic damage may occur.
Impact resistant	Survives impacts associated with typical PC Dongle – rough usage	

3.3 Electrical

Element	Specification	Comments
Operating Voltage	4.40V to 5.25V	
Active Current	8.5mA to 13mA	
Suspend Current	0.5mA	

3.4 RF Communications

Element	Specification	Comments
RF Frequency Band	2403 – 2480 MHz	
Peak TX Power	Maximum output power 4dBm	Typical 0dBm

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.

Preliminary

4. Mechanical Drawings

REVISIONS			
REV	DESCRIPTION	DATE	ECO
1	Drawn	Oct 16, 2012	-----
1	Update Shield	Oct 30, 2012	-----

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DYNASTREAM INNOVATIONS INC. #201-100 Grande Blvd. Cochrane, AB Canada, T4C 2C1 Tel - 1-403-932-9292 Fax - 1-403-932-6521		DYNASTREAM INNOVATIONS INC. #201-100 Grande Blvd. Cochrane, AB Canada, T4C 2C1		DYNASTREAM INNOVATIONS INC. #201-100 Grande Blvd. Cochrane, AB Canada, T4C 2C1 Tel - 1-403-932-9292 Fax - 1-403-932-6521	

5. Support

Users can seek application support from Dynastream Innovations, 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.

5.2 Public Technical References

Documents:

1. ANT Message Protocol and Usage

Software:

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

The above documents and software are available at www.thisisant.com

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/pages/support/developer-zone>.

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 code, and embedded reference designs with source code.

5.4 ANT Social Networks

ANT is on the following social networks,

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

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

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