

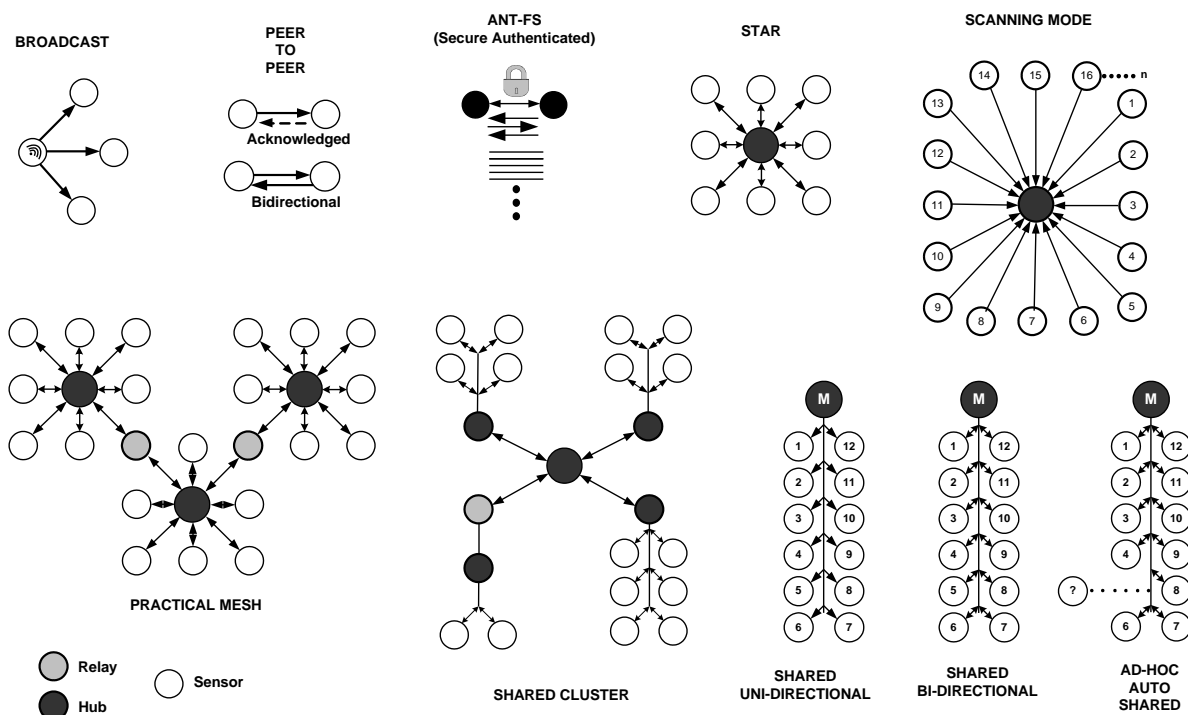
ANT USB2 Stick

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
- 2nd 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



Notices and Restricted Use Information

Information contained in this document is provided only for your ("Customer" or "you") convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications.

Dynastream Innovations Inc. ("DYNASTREAM") makes no representations or warranties of any kind whether express or implied, written or oral, statutory or otherwise, related to the information, including but not limited to its condition, quality, performance, merchantability or fitness for purpose. DYNASTREAM disclaims all liability arising from this information and its use.

DYNASTREAM does not assume any responsibility for the use of the described ANT product ("the product(s)"). Dynastream makes no representation with respect to the adequacy of the product in low-power wireless data communications applications or systems. Any Systems using the product must be designed so that a loss of communications due to radio interference or otherwise will not endanger either people or property, and will not cause the loss of valuable data. DYNASTREAM assumes no liability for the performance of products which are designed or created using the Modules.

The products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Module could create a situation where personal injury or death may occur. If you use the products for such unintended and unauthorized applications, you do so at your own risk and you shall indemnify and hold DYNASTREAM and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that DYNASTREAM was negligent regarding the design or manufacture of the Product.

The information disclosed herein is the exclusive property of DYNASTREAM, and is not to be reproduced and/or distributed without the written consent of DYNASTREAM. No part of this publication may be reproduced or transmitted in any form or by any means including electronic storage, reproduction, execution or transmission without the prior written consent of DYNASTREAM. The recipient of this document by its retention and use agrees to respect the security status of the information contained herein.

DYNASTREAM believes the information contained herein is correct and accurate at the time of its release. However, the information contained in this document is subject to change without notice and should not be construed as a commitment by DYNASTREAM unless such commitment is expressly given in a covering document.

©2011 Dynastream Innovations Inc. All Rights Reserved. ANT is a registered trade mark of Dynastream Innovations Inc.

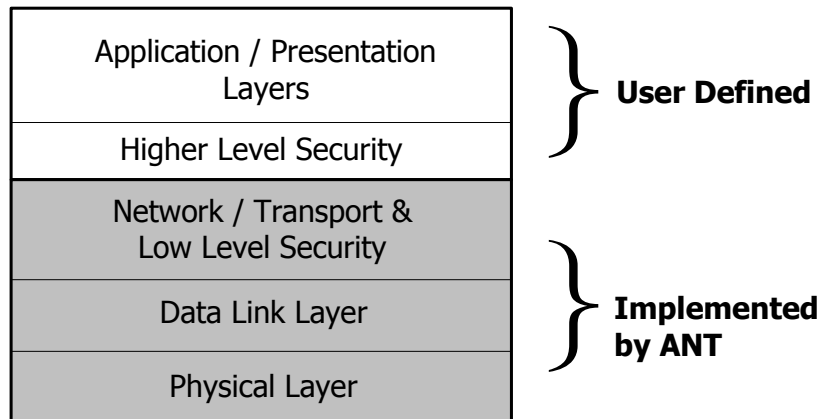
Table of Contents

1	ANT USB2 Stick.....	6
1.1	Software and Drivers.....	6
1.2	Product Model and Brand	7
2	Regulatory Approval	8
2.1	United States.....	8
2.2	Industry Canada Compliance	8
2.3	CE Declaration of Conformity.....	8
2.4	Japan	9
2.5	Australia & New Zealand	9
2.6	Russia	9
2.7	Taiwan	9
3	Specifications.....	10
3.1	Mechanical	10
3.2	Environmental	10
3.3	Electrical.....	10
3.4	RF Communications	11
4	Mechanical Drawings	12
5	Support	13
5.1	ANT Forum	13
5.2	Public Technical References.....	13
5.3	ANT Developer's Zone.....	13
5.4	ANT Social Networks	13

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.

2nd 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.

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.

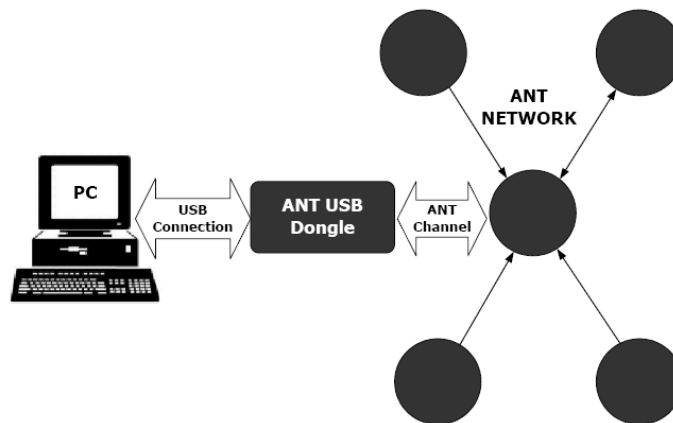
The ANT+ Alliance is comprised of companies who have adopted the ANT+ promise of interoperability. The Alliance ensures standardized communication through optimized brand value and partnerships with other top tier companies and products.

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 Software and Drivers

ANT USB2 stick drivers are available from www.thisisant.com. Operating systems supported include

- Windows XP, Vista and 7

Windows drivers have been WHQL (Windows Hardware Quality Labs) certified and are also available through windows update.

- MAC OS X10.5 and 10.6

AP2-USB and USB2 stick have been designed to work with Apple's I/O Kit framework. No additional driver installation is required on Mac OS X machines.

ANT library package containing dynamic library, managed library and demo applications are provided for application development on both Windows and Mac OS X. Drivers and ANT library packages are downloadable from www.thisisant.com.

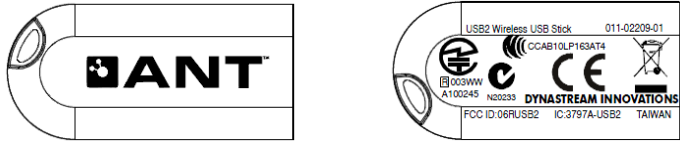
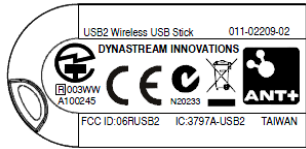
For detailed ANT feature description and message usage, please refer to the document ANT Message Protocol and Usage.

1.2 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).

The latter 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.**

USB2 Stick –OEM is for ANT+ Alliance member companies only.

Model	Printings on USB Housing
USB2 Stick - ANT	
USB2 Stick - OEM	 No printings on the other side*

* Note: To facilitate the custom logo printing, USB2 stick – OEM does not have the soft touch coating to protect printings from abrasion. This kind of coating shall be applied to both sides of the housing after the logo is printed.

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 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	

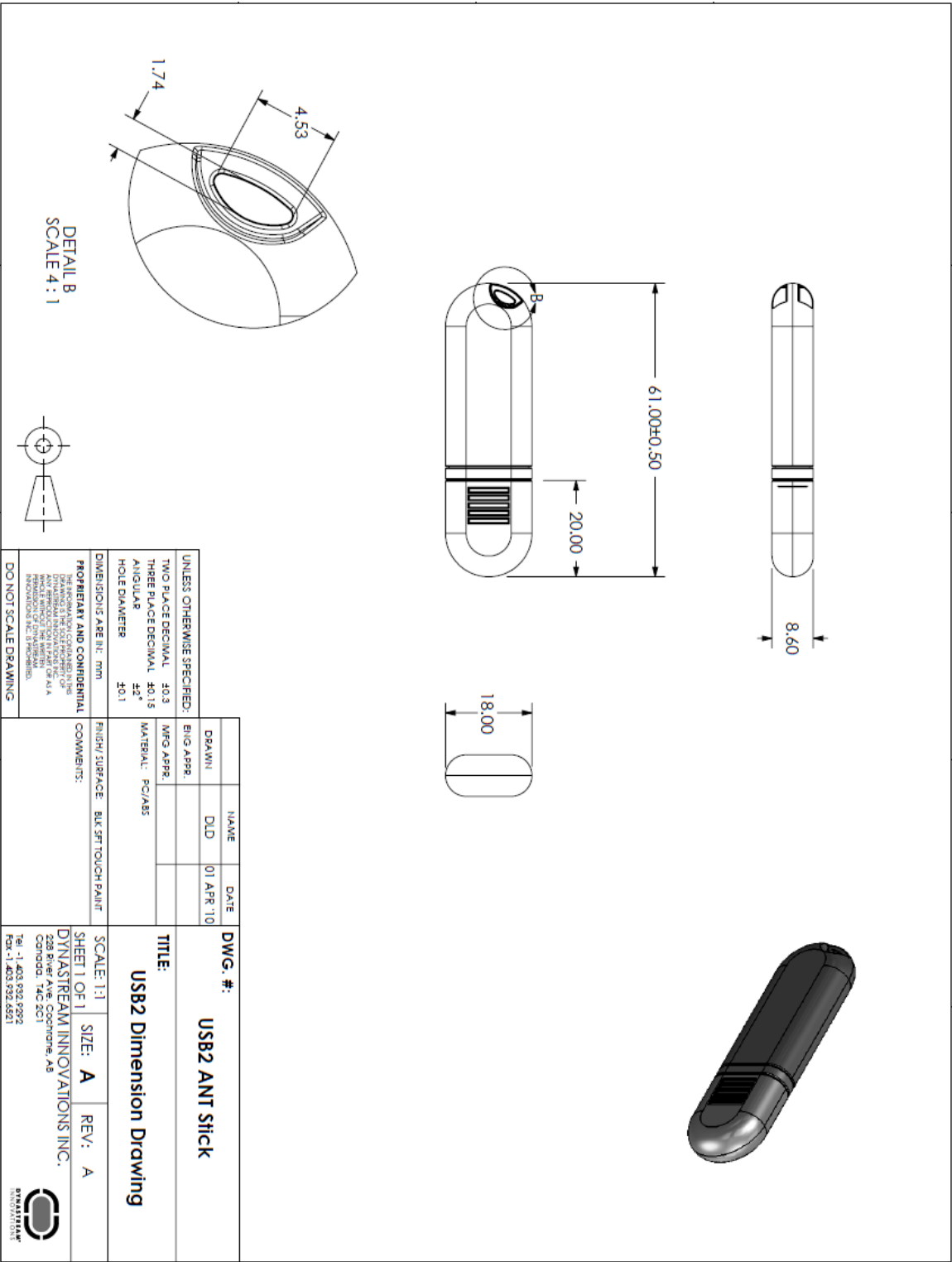
3.3 Electrical

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.

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 and 7
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 www.thisisant.com and www.nordicsemi.no

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 codes, and embedded reference designs with source codes.

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>