



## Q&A: SmartMesh-XT: Reliable Wireless Sensor Networking for Monitoring and Control

Q. What have been your most successful implementations in terms of ROI?

A. We are seeing the strongest traction in the Industrial markets due to our network reliability and low power consumption.

Q. Can you see this used for web cameras?

A. Wireless sensor networks may not be the best choice for streaming video, but we have applications that send camera data on detection of movement.

Q. It is possible to use the Demonstration Kit in ambient conditions like in Antarctic Peninsula?

A. The devices are specified to -40°C, but the evaluation kit packaging would need to be replaced by more appropriate packaging.

Q. Since the sensors are asleep most of the time, how do they remain synchronized?

A. Each time a packet is sent between nodes their clocks are synchronized. If no packets have been sent in some time, then a keep-alive is sent to the nodes.

Q. Does frequency changing occur as a response to interference?

A. No, we hop through a pseudo random ordering of all frequencies until packets go through.

Q. What is the hop rate?

A. Each transmission is on a different channel.

Q. Are snap shots of older instrumentation possible?

A. You could connect motes to any device that has serial, analog or digital outputs.

Q. What level of processing can be accomplished "on mote"? E.g. if I want to do an FFT and send a message related to the result?

A. We provide all networking application on our processor. Sensor processor functions are on a separate uP or DSP that interfaces to our mote serial interface.

Q. What is long range? Feet, miles?

A. Long range motes typically have 100 meter range indoors.

Q. Is node location functionality (RTLS) possible to implement using SmartMesh systems?

A. Some of our customers are working on RTLS, but no products have been released at this time.

Q. How are you defining communications reliability versus range? Or when you say the range is 100 m does that imply 100% communications

A. We count the number of packets received at the manager. 100 m does not imply 100% communication; it implies a reasonable RF connectivity. There are other factors that may impact reliability.

Q. Please provide comparison between ZigBee and TSMP. Is there any compatibility now and in future?

A. The comparison to CSMA that Rob presented is this comparison. We use 802.15.4 radios. The networking protocol of TSMP and CSMA are not compatible now or in the future.

Q. Can you bring the measurement into a DCS?

A. A SmartMesh manager has both an Ethernet and serial interface, so a connection to a DCS is possible. It would be necessary to develop the software interface; however, it could be done using the API.

Q. If a ZigBee compliant device is introduced into your wireless sensor network on the same channel will that confuse your network?



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A. It will not confuse the network. A TSMP network will reject the packets from that device automatically because it does not have the correct ID to join.

Q. How do you know a channel is blocked?

A. The network does not know this. It does rotate randomly through the channels and on the next transmission it will be in a different part of the band.

Q. What, if any, application software needs to be deployed to the individual nodes versus the gateway?

A. Networking application software is NOT required by the user. Other applications will reside on the sensor processor and the control system processor.

Q. Do M2135 and M2030 use the same radio? If yes, what's the difference in the modules? What's the duty cycle for the current consumption you specify?

A. Same radio. One has a power amplifier stuffing option. The duty cycle is approximately 1%.

Q. What is the mote receiver sensitivity?

A. Please see our website's Product section for more details at: <http://www.dustnetworks.com/products/main.shtml>.

Q. Can a mote be placed in an outdoor location? Is there a rugged version?

A. Our solution is designed to be embedded into rugged industrial designs from -40° to 85°C.

Q. If a mote fails that is part of a relay, how long does it take to reestablish the link?

A. If a mote link fails, the network then heals itself and establishes a new link. Reliability will be maintained by redundant connect. This takes a matter of several minutes to heal.

Q. Do you suppose how much time is necessary to incorporate your board to micro processor based sensor device?

A. This is very simple. Our customers typically take less than one man-week to interface to the serial interface. This is an extremely simple serial interface.

Q. Are the nodes separately addressable? I.e. what level of granularity is provided by the gateway API?

A. You can send and receive data, control, and statistics for any mote on the network.

Q. You say "Global" use in 2.4 GHz is misleading as you still need individual country approvals. Do you have a country list that you publish?

A. Global does not refer to non-regulated bands, but the ISM band that is available for commercial use in most countries. We do have a country regulatory approval list. Please visit us at <http://www.dustnetworks.com/flash-index.shtml> to contact us or for more information.