



What Is Interoperability?

How is interoperability changing with innovations in wireless technology?

What Is Interoperability?

Interoperability is the ability of a system or a product to work with other systems or products without any special effort on the part of the customer. Systems achieve interoperability with other products using either or both of two approaches:

- By adhering to published interface standards
- By making use of a “broker” of services that can convert one product’s interface into another product’s interface “on the fly”

In short, when it comes to wireless sensors, regardless of the brand name associated, interoperability means that all tags work with all readers – so long as they each adhere to the same communications rules.

The ISO 18000-7 standard in place today addresses a core set of functionality for RFID. This functionality is currently available with full interoperability between the different manufacturers. There is, however, additional, optional, functionality that is still being developed and agreed upon by manufacturers. Full interoperability of this optional functionality is just around the corner and well on its way to making a huge impact.

Who Is Defining the Standards?

The DASH7 Alliance is a non-profit, unbiased organization that was formed to advance the use of DASH7 wireless data technology by developing extensions to the ISO 18000-7 standard, ensuring interoperability among devices, and educating the market about DASH7 technology.

Formed in 2009, the Alliance now has more than 40 member companies - manufacturers, systems integrators, developers, regulators, academia, and end-users, all working together to promote the use of DASH7 technology in a wide array of industries and applications.

What Is DASH7 Technology?

DASH7 is a new wireless sensor networking technology that evolved from a combination of existing radio-frequency identification and sensing technologies.

Communication between two DASH7-compatible devices occurs when they are brought within range of one another and a wireless “hand shake” is initiated by one or both devices.

DASH7 features include:

- Operation at 433 MHz, globally available, unlicensed spectrum
- Based on ISO 18000-7 standard
- Multi-year battery life
- Range of up to 2 km (*potentially farther*)

- Penetration of concrete walls, water, and ability to “bend” around metal objects
- Low latency protocol that enables reliable tracking of moving objects
- Small, lightweight protocol stack that minimizes silicon costs
- Data transfer at up to 27.77kpbs (*potentially as high as 250kpbs*)
- Sensor & security support
- RTLS support

Who Belongs To The DASH7 Alliance?

Some of the DASH7 Alliance members include: the US Dept of Energy, the US Dept of Defense, Dow Chemical, Evigia Systems, IDENTEC Solutions, Lockheed Martin, RFind Systems, Savi, ST Microelectronics, Texas Instruments, and more...

What Can These Members Do?

Some of the biggest brands in wireless technology are sitting at the same table for the very first time; and they’re working together to develop universal standards through DASH7 Technology that will soon make full interoperability a reality.

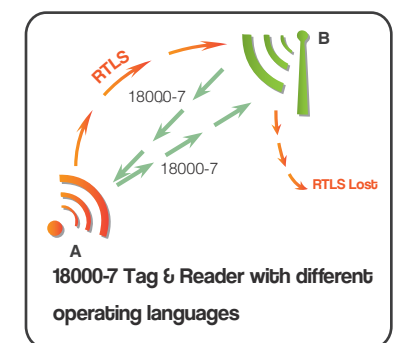
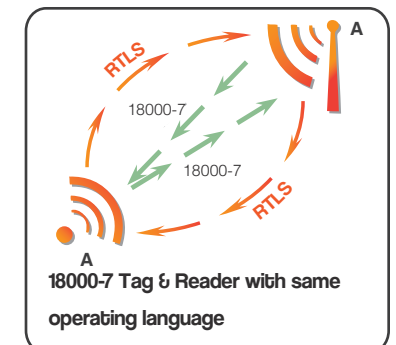
What Does Interoperability Look Like Today?

Today, interoperability of the core ISO 18000-7 commands exists between readers and tags from any manufacturer that is selling an ISO 18000-7 compliant product. These core ISO 18000-7 commands include the ability to identify tags within range of a reader and to read and write data to and from a tag.

There are several extensions to this core set of commands that are considered optional and may or may not be implemented on a particular product (*even if the product is considered to be ISO 18000-7 compliant*).

Additional functionality for sensors, LF, and RTLS, is not yet a part of the command set, either the core set or the optional set, for the ISO 18000-7 standard, but not for long. DASH-7 members are working hard to standardize on a method for this subset of optional commands and put forward that method to ISO in the next few months. Once agreed upon and sent forward to ISO, all manufacturers will decide on their own whether to support this optional set of commands and which of them to support.

For example, today an automotive manufacturer can use RTLS tags so it can locate a specific model in an overpopulated holding yard, instead of relying on physical runners spending days searching for a sedan without windshield wipers (*no sense in shutting down the assembly line because you ran out*



of windshield wipers). Without RTLS tags, finding a specific car and installing missing parts is an expensive and time-consuming process; but at this time, both the reader and the tag have to be ISO 18000-7 compliant and support the optional RTLS command set.

If instead, the car manufacturer is using a tag and reader combination where the reader does not support the optional RTLS command set, even if they are both adhering to ISO 18000-7 standards, the RTLS communication (*which originates with the tag itself*) will not be received by the reader. In effect, the RTLS will be dropped.

Frequently Asked Questions

Do you need a new infrastructure?

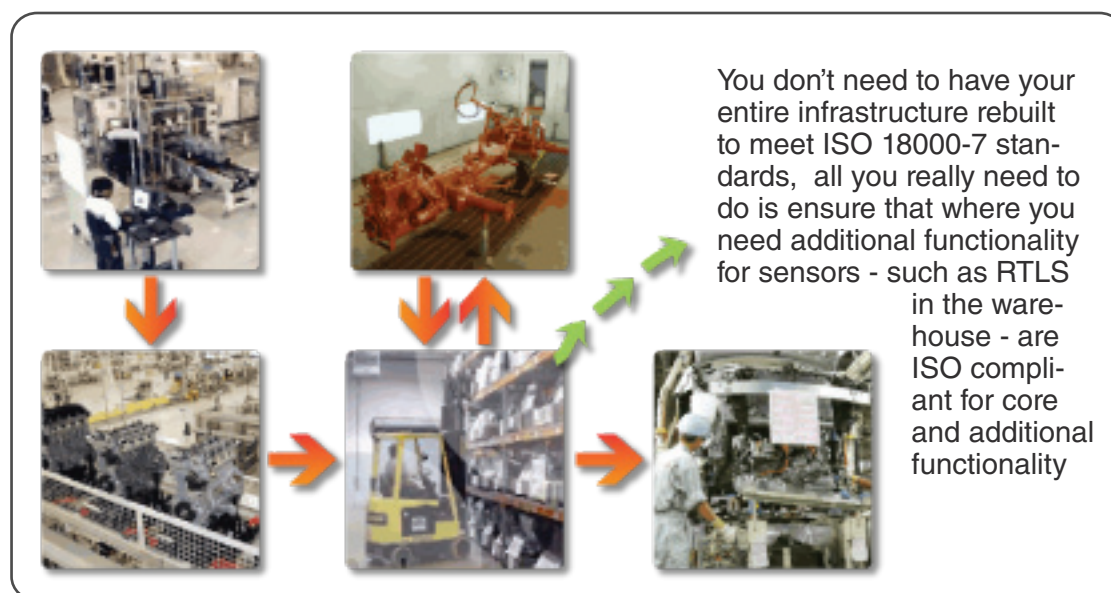
No! Solutions like RFind System's Tag to Tag Communication, mean that you can have an industry leading RFID solution without the costly expense of retrofitting your current infrastructure.

Should you wait for full interoperability before implementing an RFID solution?

No! Even though members of the DASH7 Alliance are working on ratifying new standards that will make full interoperability a reality very soon, you can still update/upgrade/implement a universal RFID solution that will solve your immediate pains (*logistics, supply chain, sensor*).

How can I organize my supply chain to maximize efficiency and minimize investment?

If you are worried about interoperability, believe it or not, you don't need to have full interoperability (*RTLS, Sensor, LF*)



throughout the supply chain.

Think about an engine manufacturer... as the engine is built on the assembly line it is assigned a tag. When the completed engine is put in the warehouse where it requires RTLS (*tag initiated communication*) and therefore the reader and tag need to both support the optional RTLS command set. By having this infrastructure, the leadhand/supervisor/manager can readily identify and locate any individual engine in real time – even if it was placed on the wrong rack or section, saving hundreds of man-hours/year in addition to reducing other operating expenses. After he “locates” the right engine, he sends it to an offsite painter – the painter scans the tag so everybody knows where the engine is (*but you don't need RTLS for that*). When the engine is “hot rod” red, it's shipped back to the warehouse and put in the outgoing racks (*RTLS*). Two weeks later, the shipper “locates” the engine and puts it on a truck to its final destination.

Even though the engine might have travelled hundreds of miles, so long as the entire wireless infrastructure was ISO18000-7 compliant, nobody ever lost track of it and the process was efficient; what's more, the reader and tag only had to support the optional RTLS command set in the warehouse. No new infrastructure was needed, everything just worked – which is what the DASH7 Alliance is making happen.

About RFind Systems

Dedicated to building an efficient, turn-key RFID/RTLS solution, RFind's patent pending Tag to Tag™ communication technology was developed in 2005.

Tag-to-Tag communication is a more cost effective and efficient means of implementing RFID/RTLS technology than conventional infrastructure investments allow.

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About the Author

Sharon Barnes is the award winning CEO of RFind Inc., a leading edge RFID and RTLS manufacturer that provides wireless solutions that are scalable, inexpensive, and do not require any infrastructure changes to implement. Even in the worst environments that others fear to tread, RFind's tags work.

For more information go to www.RFind.com

