



Long Range RFID Benchmark Test Results

The Omni-ID Ultra
Achieves a Remarkable
135 Foot Read Distance

Review by Louis Sirico and
benchmark tests by Martin Bjerre,
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www.RFID.net

Our team previously evaluated twelve commercially available durable asset tags – passive RFID tags designed to be mounted directly on metal, operate near metal, or submersed in water (read the in-depth evaluation here). We define **Durable Asset Tags** as RFID tags that are specifically designed to withstand a variety of challenging environmental operating conditions. In order for a tag to be included in this category **it must have an IP Rating** which provides a standardized measure for durability. Based on our tests, the best overall performing tags came from Omni-ID.

Now, in September 2009, Omni-ID released new versions of their RFID tags including a new tag called the Omni-ID Ultra, a tag they claim can be read 100 feet away – further than any other passive RFID tag on the market. In this edition, we’re going put that claim to the test and see if the Ultra really is the ultimate passive RFID tag.

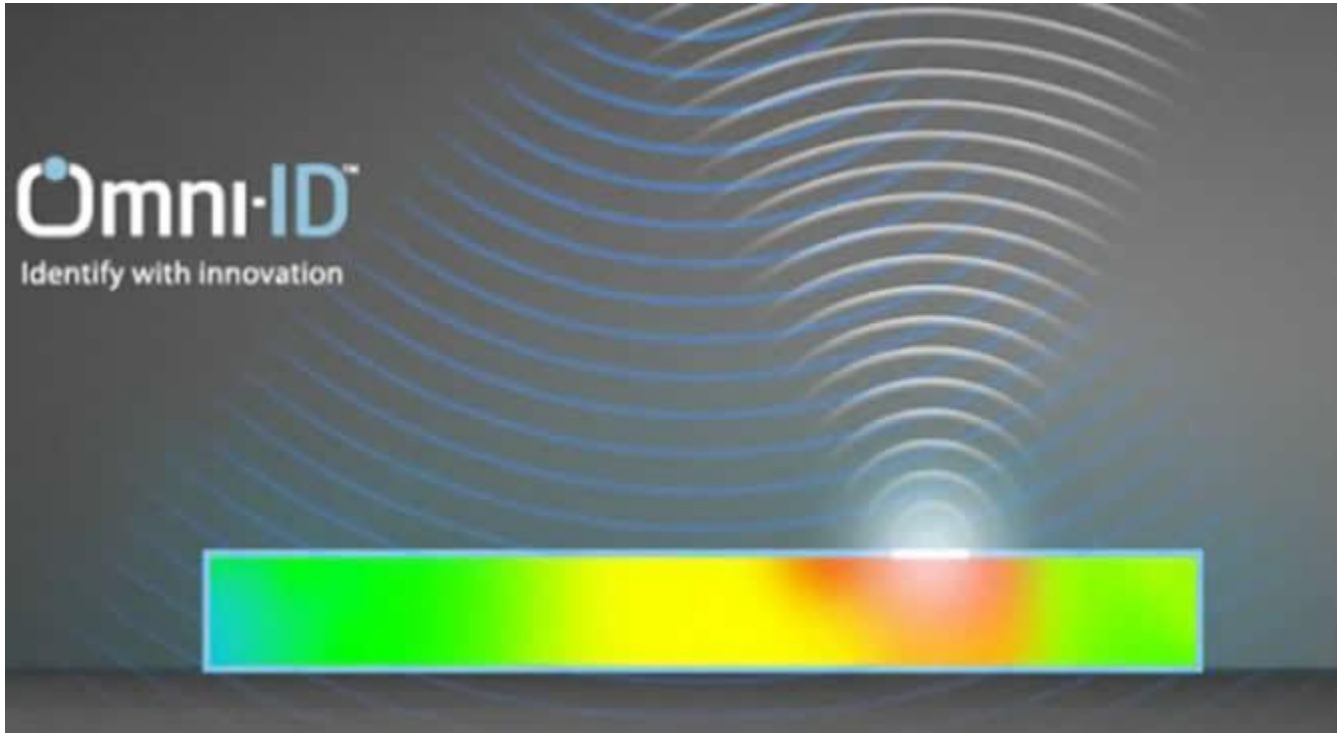
During the past several years, I have heard many people say, "RFID does not work with metal and liquids" in the context of passive UHF technology, more specifically with EPCglobal Class 1 Gen 2 or ISO 18000-6C. This unfortunate misconception has been perpetuated by misinformation from vendors with competitive offerings in other frequencies. In reality, anyone can now achieve tag reads on metal from over 100 feet away and 2½ feet away submerged in water if the proper tag, reader, and antenna is used.

The durable asset tracking tags we’re going to test are from Omni-ID. Omni-ID tags do not contain batteries, they are passive. However, unlike other passive RFID tags that use large metallic antennas to achieve longer read ranges, Omni-ID’s tags capture RF energy using something called a plasmonic structure, which is totally unique and even patented.

We were able to read the Ultra from 90 feet away using our hand-held and in our stationary RFID reader tests the Ultra was read 135 feet away. Our team has never seen this kind of read distance from a passive tag.



How the Plasmonic Structure Works



Inside of every Omni-ID tag is an integrated circuit with a small loop antenna.

As RF waves are transmitted from a RFID reader towards the tag, the plasmonic structure captures those waves and concentrates the energy from them around the integrated circuit, as you can see here. The red shows where the greatest amount of energy is located inside the tag. The concentrated energy activates the integrated circuit which allows the tag to respond to the RFID reader and provide the data stored on the tag, such as an electronic product code or other unique information.

Based on our tests, the plasmonic structure makes the Omni-ID tags extremely energy efficient.

*Watch the video
at <http://rfid.net>*

Tag Specifications

Tag Image	Manufacturer / Product Name (click for more details)	Optimized Frequencies (in MHz)	Durability	Dimensions / Application methods
	Omni-ID™ Max Pro Wizard's Rating: ★★★★★	902-928 (US) or 885-868 (EU) or 952-955 (JPN)	Rigid case (ABS) IP68 -40 °C to +85 °C MIL STD 810-F BS EN 60068-2	123 x 59 x 6.6 mm 4.85 x 2.3 x 0.26 in Foam adhesive, bolt, or rivet
	Omni-ID™ Max HD Wizard's Rating: ★★★★★	860-960 (Global)	Rigid case (ABS) (std) / Polycarbonate IP68 ABS: -40 to +85 °C PC: -40 to +120 °C MIL STD 810-F BS EN 60068-2	140 x 66 x 14 mm 5.51 x 2.6 x 0.55 in Foam adhesive, bolt, or rivet
	Omni-ID™ Ultra Wizard's Rating: ★★★★★ A Wizard's Choice 	860-960 (Global)	Rigid case (ABS) (std) / Polycarbonate IP68 ABS: -40 to +85 °C PC: -40 to +120 °C MIL STD 810-F BS EN 60068-2	210 x 110 x 20.8 mm 8.26 x 4.33 x 0.82 in Foam adhesive, bolt, or rivet

All of the above tags are marketed as being designed for tracking metal assets in harsh environments including:

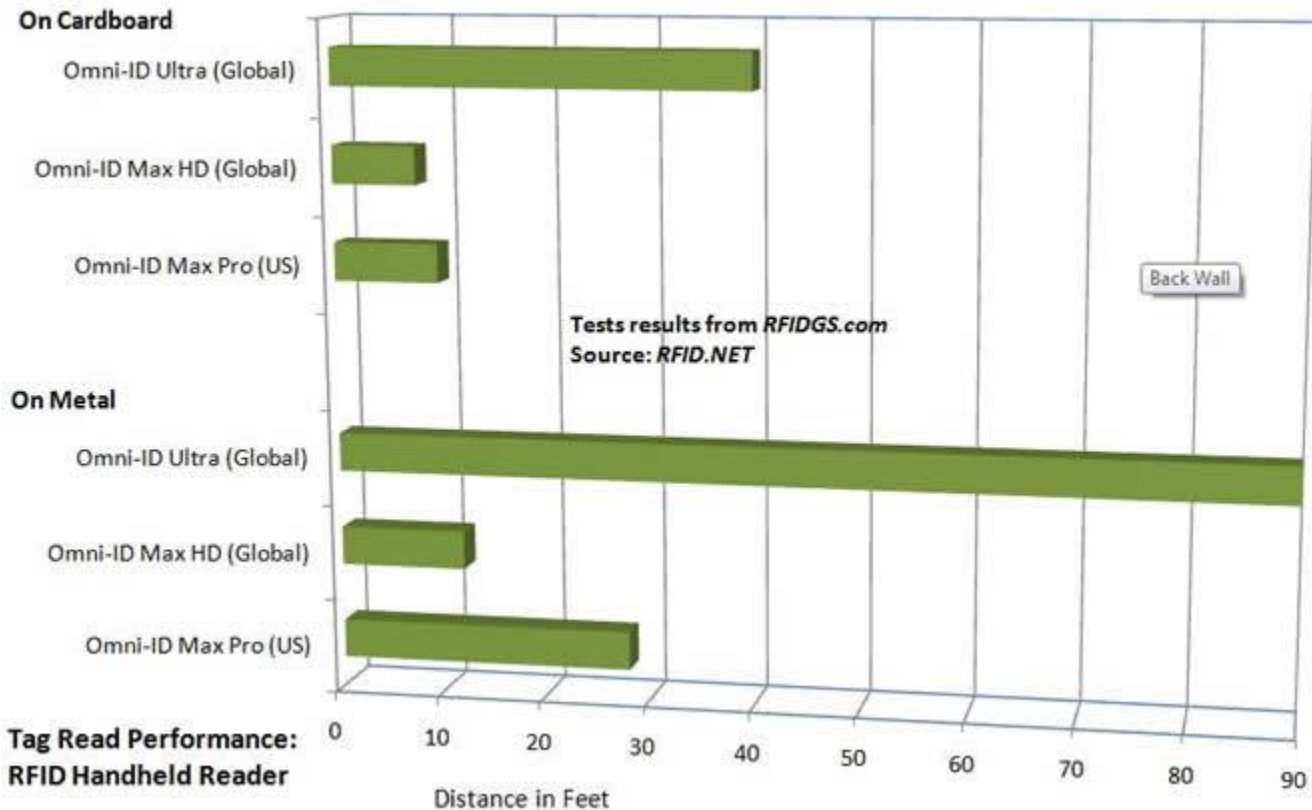
- Work-in-progress (WIP) management of durable goods
- Cargo and container tracking
- Military Asset Tracking
- Construction and Heavy Equipment
- Transportation and Logistics

Our Passive RFID Durable Asset Tag Performance Benchmark Tests

All tests are designed based on real-world scenarios that a tag will encounter. At least three trials of every test is performed. When possible, a different tag is used for each test in order to account for production variances. This also eliminates having a really good tag or a really bad tag that skews the results. Although tags may read briefly at further distances, each tag must maintain a 3 second read before the distance results are recorded. In some cases a tag would be read very briefly at a much greater distance than the recorded result demonstrates. Our team selected 3 seconds because it helps to eliminate tags reads resulting from stray reflections. After several weeks of extensive testing by our team of experts at RFID Global Solution, the results were captured and the averages are calculated and published below.

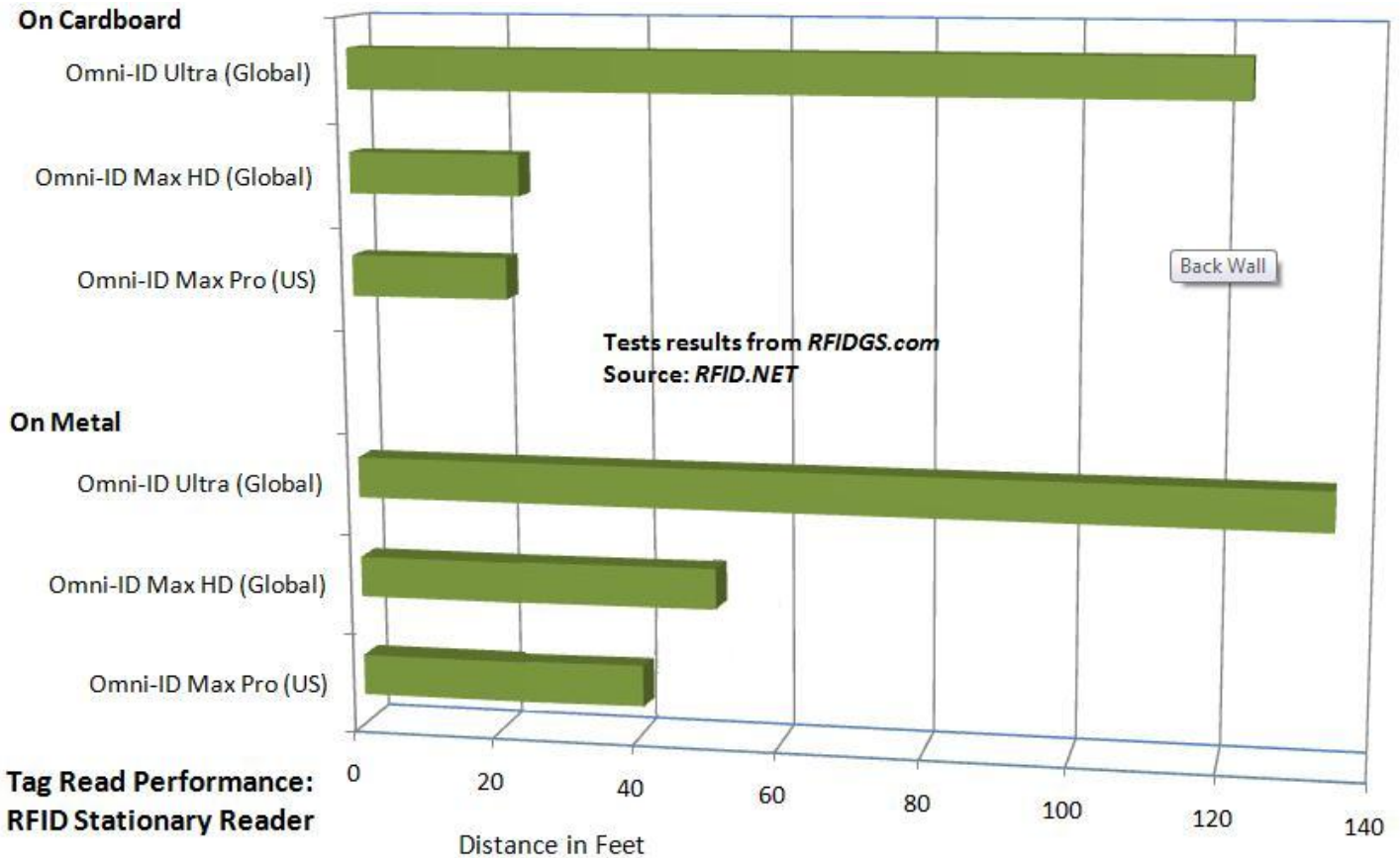
Tag Read Performance with Hand-held RFID Reader

In our handheld RFID Reader tests, all three tags performed better on metal than on cardboard, which is to do be expected given that is how they are designed. Keep in mind that the Ultra and Max HD are global tags, meaning they are balanced to for operation in all regions of the world. The Max Pro we tested is designed for operation in North America. All reader equipment used in the published tests below are for North America. What we found most astonishing is that **we were able to read the Ultra from 90 feet away using our hand-held.**



Tag Read Performance with a Stationary RFID Reader

In our stationary RFID Reader tests, the Ultra was read 135 feet away. Our team has never seen this kind of read distance from a passive tag, only semi-passive and active tags. Remember, the Ultra has no battery which makes it ideal for transportation, logistics, cargo and container tracking. Given this kind of performance, we have to say Omni-ID really has created the Ultimate Passive RFID tag.



Tag Read Performance:
 RFID Stationary Reader

About Our Testing Protocol

Our tag testing protocol comes straight from the engineering lab of RFID Global Solution, Inc. one of the industry’s leading passive and active RFID deployment experts. RFIDGS has unparalleled passive RFID solution design and field installation experience, and more hands on, “in the trenches” experience making passive tag solutions perform, than anyone in the industry. RFID Global Solution leverages its extensive relationships with engineering teams across the industry to get access to the latest product innovations. These new products are put through their paces in a series of performance tests and application scenarios, allowing RFIDGS to gauge how products will perform in real world situations. Visit RFID Global Solution on the web at <http://RFIDGS.com>.



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For Additional Information

To watch the video product review for these products visit <http://RFID.net>.

If you would like to try the Omni-ID tags for yourself visit <http://Omni-ID.com>.

Do you have questions or would you like your product(s) reviewed? Contact us at Info@RFID.net

About The Author



Louis Sirico is one of the most recognized experts in the RFID industry. He is the host of *The RFID Network Video Series* and the founder of *IndustryWizards.com*, a global community of experts in RFID and wireless technologies. He has served as an RFID subject matter expert for *CNN*, *Fox News*, *CBS*, *CNBC*, and *The New York Times*. He has published hundreds of articles in magazines such as *The Cutter Consortium*, *Quality Digest*, *Nikkei Business Publications*, *SAP Information Magazine*, *Inbound Logistics*, *Integrated Solutions*, *Traffic World*, and *RFID Operations*. His articles and videos reach an audience of over 100,000.

About The RFID Network

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