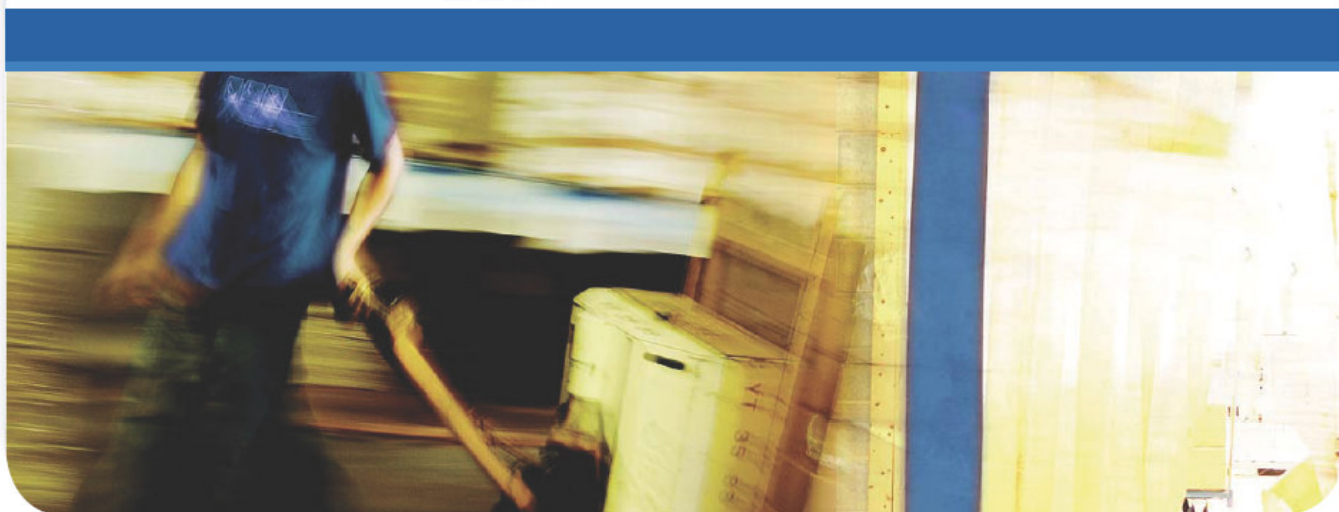




PowerID Starter-Kits

Getting the Most out of Your Starter-Kit



August 2009

Getting the Most out of Your Starter-Kit

The purpose of this document is to assist PowerID Starter-Kit users to obtain the maximum performance from the PowerID system. PowerID battery-assisted, passive (BAP) RFID labels outperform passive tags due to the label's unique integrated battery. In order to obtain the best possible performance out of PowerID labels, we highly recommend that you follow the guidelines detailed below.

A. Background

Whereas passive labels rely on gathering energy from the reader's signal to wake up the label's chip and provide the backscatter signal, BAP labels contain an integrated power source. This power source eliminates the need to gather energy from the reader and reach excitation, which is the primary challenge for passive labels.

The result of the differences explained above is that PowerID BAP labels perform 4–5 times better than passive tags in a perfect environment. As detailed below, a “perfect environment” is a combination of a good reader and antennas, open space, and an electromagnetically noise-free environment.

B. Guidelines

The guidelines below refer to the following elements that comprise the RFID system: labels, readers, antennas, and environment.

1. Labels

Use the right label for the right application.

For example, use the PowerG for general purpose logistics such as carton boxes and plastic containers, and the PowerM for metal items such as metal cylinders. If you try to apply the PowerG on a metal item, the label will not respond as the PowerG is not designed for metal items.

Label orientation is also important. As PowerID labels have linear polarization, try using linear-polarized reader antennas and position them according to the label's orientation whenever possible.

2. Readers

Not all readers are created equal.

Some readers perform better than others, and this is especially true when used with PowerID labels. Because of the higher sensitivity of the PowerID label, the reader's receiver sensitivity should be sufficiently high to be able to receive this signal. Note that since high sensitivity does not help the performance of passive labels because this performance is limited by the reader-to-tag link, some readers simply do not have this high sensitivity.

PowerID has tested many fixed readers and recommends using the **Impinj Speedway FCC/EU** or **ThingMagic M5, M5e** reader in bi-static mode for optimal performance.

Motorola XR450 or XR480 in Dual Port mode and **Sirit IN 510** readers may be

utilized; however, due to their lower sensitivity they will provide lower performance than that of Impinj and ThingMagic.

In case the use of a handheld reader is required, you should expect to receive degraded performance compared to fixed reader. PowerID BAP will still outperform any passive tag but the difference, in terms of read range, will be less significant. The reason for degradation is that the small size of the handheld limits the size of the antenna which in turn limits the gain and beam width of the antenna. Additionally, a handheld reader uses an internal battery that limits the output power of the reader. The end result is an unwanted Tx-to-Rx leakage signal at the reader's internal circuitry that degrades the reader performance and the read reliability of the labels.

PowerID has tested many handheld readers and recommends using one the following handheld readers for obtaining best results:

1. Motorola/Symbol MC9090 - G
2. MaxID HR250
3. CSL CS-101

3. Antennas

Use the optimal antenna.

It is important to use a high-performance antenna with high gain, narrow beam width, and with the appropriate polarization.

The use of a high-performance antenna enables optimization and less interference of the RFID system.

Also, the use of appropriate polarization is important. If, for example, the label's orientation is known in advance at the read point, then the use of a matching linear-polarized antenna is highly recommended.

4. Environment

The environment will affect RF performance.

The environment in which the RFID system is deployed has an influence on the performance of the system. For example, electromagnetic interfering sources such as cellular base stations or communication systems with powerful transmitters, metal surfaces, corridors, etc. might degrade the system performance.

If you do not see a significant performance improvement over passive tags, please contact support@power-id.com