

HHP's Adaptus™ Imaging Technology Delivers Performance and Versatility

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May, 2003



Introduction

The health and vitality of an industry can be measured by the rate and magnitude of its technical innovation. This innovation fuels economic growth, enables new and exciting applications and gives consumers increasingly better product choices. The natural evolution of technology and its effect on economics was termed “creative destruction” in 1942 by the economist Joseph Schumpeter. In his landmark paper, *Capitalism, Socialism and Democracy*, Schumpeter explained, “The interaction of technical innovation with the competitive marketplace is the fundamental driving force in capitalist industrial progress.” In other words, it is necessary to leave older technology behind in favor of bright innovations that fuel economic growth.

Schumpeter makes the point that, for an industry to grow, its technology must continuously offer customers a choice of improved function and performance beyond their current implementation. It is this philosophy that drove the development of HHP's Adaptus Imaging Technology. The high performance and versatility of this innovation delivers an improved choice over laser scanning for today's data collection customers. Adaptus Imaging Technology serves today's data collection needs while providing capability required for the future, thereby offering extraordinary value to the customer.



Figure 1 – HHP's Adaptus Imaging Technology delivers data collection capability that is characterized by high performance, versatility and extraordinary value.

What is Adaptus?

While HHP has been delivering high performance and versatile products for many years, this next generation of data collection solutions powered by HHP's Adaptus Imaging Technology set a new standard for customer value. When applied to applications, Adaptus delivers:

High Performance - Even for traditional data collection needs, the high performance reading of Adaptus enhances ease of use regardless of data collection conditions or environmental challenges.

Versatility - The multiple functions delivered by Adaptus allows one data collection device to serve many purposes, some not yet known. Current needs are met and Adaptus-enabled devices can adapt to future needs. The versatility of Adaptus serves the broad-based needs of today and prepares you for tomorrow.

Adaptus High Performance

The high performance of Adaptus delivers aggressive read rates and depths of field on 1D, stacked linear and matrix codes. This aggressiveness applies even in challenging reading environments where lighting conditions might be difficult and bar codes are of poor quality. This high performance and aggressive behavior over a broad range of targets and environments delivers the most important benefit: product ease of use in many applications. The buying agent and end user do not need to wonder if the Adaptus reader will do the job as reading conditions (bar code density, ambient light and required depth of field) change. They can just be confident that it works.

HHP's IT5600 linear imager clearly demonstrates the adaptive nature of the technology by delivering world-class performance on high-, medium- and low- density bar codes all through one device. The product delivers 5 inches of depth of field on 5 mil codes; 23 inches depth of field on 13 mil 100% UPC; and between 40 and 60 inches on 55 mil bar codes depending on ambient lighting. Couple this robust depth of field performance with the ability to read low quality bar codes that may be damaged or low contrast. The result is a user-friendly product that can adapt to any scanning application.



Figure 2 – Adaptus delivers performance that enables a single device to service an application with challenging and diverse requirements.

Adaptus Versatility

Adaptus also delivers a rich and diverse set of functions beyond linear bar code reading. The additional functions enable a single device to be used in many applications, including those that may not be presently known. Adaptus powered data collection allows a device to serve the user's application today, no matter how diverse, while providing additional functions for future needs.

For example, think of a package delivery application that reads linear and PDF417 bar codes today, but may require converting to Data Matrix in the next five years to consolidate the number of bar codes on a package. Adaptus enables world-class linear and PDF417 reading today, but preserves the reader investment by providing Data Matrix functionality as well. The broad range of functions with world-class performance delivers a broad reading capability able to adapt to an expansive range of applications.



Figure 3 – HHP's IT4000 is a critical Adaptus building block. Implementing a CMOS camera, it is the eyes of the Adaptus technology.

Products enabled by HHP's IT4000 area imager all demonstrate the Adaptus multi-functional approach to data collection. Powered by Adaptus, these products can read all popular 1D, stacked linear, and matrix codes, as well as postal codes and OCR. Because Adaptus implements digital imaging, these products can also capture a picture for processing or storage. This compelling versatility allows Adaptus to perform basic tasks as well as competitive bar code scanning, but then exceeds the competition by delivering added-value functions like matrix bar code reading and picture taking. Adaptus serves both typical and specialized bar code reading needs today, while protecting the future.

“...a normally healthy economy was not one in equilibrium, but one that was constantly being disrupted by technological innovation.”

(The Economist (on Schumpeter), 1999)

Adaptus Technology

The power of Adaptus is delivered by three critical technology building blocks: innovative electro-optics, leading-edge computing architectures and fourth-generation decoding and image processing. These three components are the results of thirty years of HHP design and manufacturing perseverance. These tightly integrated elements provide high-end performance and rich, reliable functionality.

The IT4000 miniature image engine best represents the innovative optics of Adaptus. This product combines a digital camera, illumination optics and aiming optics in a package roughly the size of a sugar cube. These critical components are creatively packaged to be the eyes of Adaptus and to provide high image quality.

The brain of Adaptus is its leading-edge computing architecture. With a 32-bit processor at its core and other state-of-the-art components, the architecture is expertly balanced to deliver high-end processing performance while being considerate of battery consumption.

The logic directed by the Adaptus brain is HHP's fourth-generation decoding and image processing. This software defines the personality of Adaptus by enabling aggressive decoding, even in difficult environments, and a rich base of functionality beyond linear bar code reading. The efficient design of the software further enables robust algorithms that emphasize read rate and accuracy.



Figure 4 – The image processing of Adaptus enables fast, accurate decoding in all environments. Left, the software locates the center of the symbol and determines the orientation.

Adaptus Features

Adaptus delivers extraordinary reading performance to enable ease of use and device versatility. These end-user benefits are provided by the following Adaptus enabled features:

Linear Imager Products (IT5600, IT5800)

- Industry leading depth of field on high-, medium- and low-density bar codes, all in one device
- Extraordinary read rate
- Aggressive reading of poor quality codes
- Ability to read future codes

Area Imager Products (IT4000, IT4010, IT4080, IT4500, IT4600, IT4800, Dolphin 9500)

- Competitive linear bar code scanning
- Industry-leading PDF417 reading
- Aggressive reading of specialty codes like matrix and postal codes, and including OCR
- Picture taking for processing or storage
- Capture, correct and compress signature
- Omni-directional reading of all codes
- Reading multiple symbols with one trigger-pull



Figure 5 – Adaptus technology enables image capture as a data collection function. Image capture is used to record an event or exceptional condition.

Conclusion

Adaptus Imaging Technology from HHP is the next logical progression in innovative data collection solutions. It is the creative choice that favors high performance and versatility over solitary functionality, and is the data collection choice that naturally stimulates economic growth. Adaptus delivers extraordinary value through high reading performance and device versatility. With Adaptus powered products, customers can confidently use image-based data collection. With Adaptus, they know to expect the highest performance and flexibility. They know they are working with a company dedicated to imaging. They know they are working with the imaging leader. They know they can depend on HHP.



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