

Wireless LAN Users and Applications
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User and Application Overview for Wireless Data Collection Systems

Background:

Wireless, portable, local area data collection systems have been commercially available for about 15 years. Since the mid 1980's their usage has increased dramatically. An October 1990 study conducted by Venture Development Corporation, entitled "*The U.S. Market for Portable Data Collection Terminals*", indicated that sales for wireless data collection systems surpassed \$100 million for the first time in 1990. The study projects that the market for these systems will exceed \$350 million by 1995.

Current data collection systems include both portable, handheld devices and mobile, vehicle mounted units which communicate to a host computer network through an associated network of radio base stations. Most operate under FCC part 90 rules utilizing licensed frequencies in the UHF range, with RF link data rates up to 9600 bits per second. Recently, some equipment manufacturers have announced unlicensed spread spectrum systems in the 902 - 928 MHz band under FCC Part 15. These devices operate at data rates as high as 230K bits per second. All current portable data collection systems utilize vendor proprietary modulation methods and communications protocols.

The users served by the current generation of wireless data collection systems could benefit greatly from the availability of equipment conforming to an appropriate wireless communication standard. Benefits could include inter-operability of portable, mobile, and fixed devices on a common communications backbone, the availability of increased bandwidth to support larger numbers of devices and more extensive applications, and the ability to intermix equipment from several manufacturers within a single network.

Portable Wireless Data Collection Applications

Significant application areas for portable wireless data collection terminals exist in retailing, warehousing and distribution, and manufacturing environments. Usage of RF devices in these sectors has paralleled the increase in utilization of automatic identification technology, most notably bar code scanning, electronic data interchange (EDI) technology, and point of sale (POS) retail transaction systems. In most cases wireless data collection terminals

are used in applications where real-time remote access to large data bases is required.

Retail Applications

Retail applications of wireless data collection terminals are generally restricted to handheld devices. Retail sites vary in size from specialty stores of a few thousand square feet, single story discount and grocery stores of up to 100,000 square feet, and multi-story department stores in excess of 500,000 square feet. Present data applications include:

- * Inventory Control
- * Order Entry
- * Price Verification
- * Receiving

Many of these applications are ancillary functions to Point of Sale operations and utilize the same data bases. Point of Sale systems are also likely candidates for wireless interconnection.

Industrial Applications

In industrial installations mobile wireless data terminals are used in conjunction with handheld devices. Mobile terminals are generally installed on fork lifts or similar types of vehicles which are capable of moving throughout a manufacturing facility. Handheld devices may be utilized in more localized operational areas. Key industry segments which currently utilize wireless data collection systems include aerospace and defense, automotive, consumer products, electronics, and telecommunications equipment manufacturing. Industrial facilities commonly range in size from under 100,000 square feet to upwards of several million square feet. Present day applications include:

- * Inventory Control
- * Order Processing
- * Quality Control
- * Receiving
- * Shipping
- * Work in Process Tracking

Wireless mobile and portable devices in industrial applications have replaced both paper-based and wired systems.

Warehousing Applications

Users of wireless data collection systems in warehousing operations generally utilize a mixture of portable and mobile terminals. Facilities are generally smaller than industrial facilities, ranging in size to upwards of one million square feet. The trend in warehousing is towards high density vertical storage, using racks of up to sixty feet in height. Current warehousing applications include:

- * Inventory Control
- * Order Processing
- * Receiving
- * Shipping

Wireless mobile and portable devices in warehousing applications have replaced both paper-based and wired systems.

Trends in Portable Data Collection Applications

Two significant trends are evident in the data collection industry.

1) Users are interested in higher levels of integration between portable and mobile systems and the host computer networks that service them. Present day data collection systems may often be viewed as peripherals to the host networks. The host/peripheral distinction is beginning to blur as users contemplate new applications and overall system performance requirements increase.

2) Improvements in low power microcomputer technology put substantially more data storage and processing capabilities into portable and mobile devices. Users are interested in transmitting substantially more information to and from these devices, yet are looking for reductions in system response time.