WiData Firefly
Hand Held Communicator
PCMCIA Card

User's Guide

HPC-2000-00AA
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FCC Requirements

This device must operate in compliance with Federal Communications Commission (FCC) Rules and Regulations Parts 15. See FCC registration label, located on the bottom of the equipment for the FCC, registration.

This equipment has been tested and found to comply with the limits for both Class A and Class B devices, pursuant to Part 15 of the FCC Rules.

RF Notice

Any changes or modifications to WiData Corporation equipment not expressly approved by WiData Corporation could void the user's authority to operate the equipment.

Contents

Introduction

WiData Firefly System

The Firefly RF Location System is designed to permit users to determine the position of tagged assets in both indoor and outdoor facilities such as factories and freight yards. The system locates tagged assets by a process involving redundant triangulation. Each tag autonomously emits a 2.4 GHz direct sequence spread spectrum (DSSS) radio signal at predetermined blink rate. Each tag's blink rate is randomized around its predetermined value to minimize the number of collisions between transmissions made by different tags. The signal emitted by the tag is received by a minimum of four DSSS receivers each of which are capable of decoding that tag's transmission. A typical transmission contains a preamble which is used to synchronize the receiver, the tag's serial number which identifies the tag, a status word which monitors various tag functions, data stored in the tag's memory and finally a CRC used to assure that the tag's message is correct as received.

Tag configuration parameters such as blink rate and user data to be stored in memory are loaded into the tag using a device called a Hand Held Communicator (HHC). The HHC consists of a Type II PCMCIA card inserted into a laptop or handheld PC. The PCMCIA card contains a short range (2 to 10 feet) radio transmitter and receiver which communicates with a very low power transmitter and receiver contained in each tag. This short range communication link operates at 2.4 GHz. The modulation scheme used by the PCMCIA card was chosen to minimize power consumption by the battery operated tag receiver. The DSSS transmitter allows the system to locate users of the HHC anywhere in the service area covered by the system.

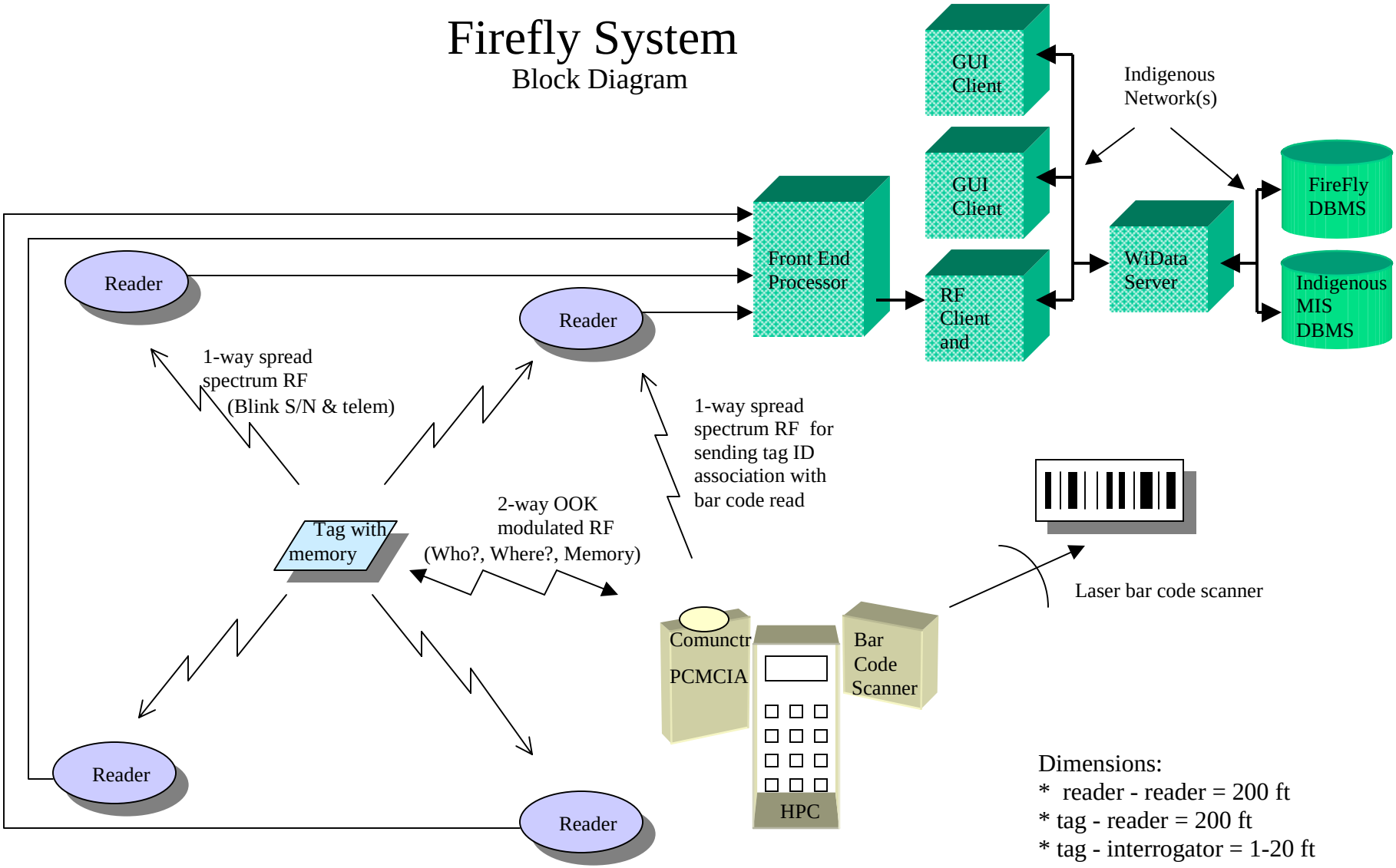
Hand Held Communicator

The WiData Corporation Communicator PCMCIA card allows the handheld computer, laptop computer, or any other computer with a PCMCIA slot to operate as a Firefly Communicator. Tag-to-Communicator bi-directional data transfers are accomplished using the OOK/FSK RF modulation link. The Communicator-to-RF Processor DSSS RF modulation link is one-way only. Figure 1 shows a typical WiData Firefly System. The handheld computer can also include standard WLAN and Bar Code Scanners to further enhance system capabilities.

Power Management

The Hand Held Communicator PCMCIA power consumption is handled by the application software installed on the handheld computer. The software will power down the card during periods of in-activity. Any time the Hand Held Communicator is not in use, the handheld computer should be installed into its battery charging cradle.

Firefly System
Block Diagram



Dimensions:
* reader - reader = 200 ft
* tag - reader = 200 ft
* tag - interrogator = 1-20 ft
* WLAN - WLAN = 200 - 500 ft

Figure 1

Card and Socket Services

WiData Corporation has developed CLB library files, INI configuration setting files, INF setup information files, VXD virtual drivers, and CFG configuration files that enable the card to be recognized by a range of card and socket servers.

Package Contents

The hardware package consists of:

- WiData Firefly Hand Held Communicator PCMCIA card (HPC-2000-00AA)
- Software installation diskette

Requirements

Handheld computer or PC with Type II PC Card slot.
Card and socket services for PC card
External antenna cable and antenna (usually provided with handheld computer)
I/O ports 0210-0217
2k x 8-bit RAM Memory block for PC card
Up to 384k byte conventional memory depending on specific application software

Most handheld computers require special software that allows the disk drive to be flashed. Verify that the appropriate handheld computer companion software the allows files to be flashed or loaded to the internal disk is available and that all docking station and cable equipment is also available. This is required if the software is to be loaded.

Installation

PC Card

Installation and removal methods vary for different host computers. Refer to host computer documentation of more detailed information.

Arrows on the top of the PC Card indicate FRONT with arrows. This is the end of the card that is to be inserted into the computer.. To support hot insertion and removal of the card, verify that the proper library and configuration files as well as socket and card services are loaded onto the host computer.

After the card has been seated into the host computer, connect the antenna cable to the special RF connector on the PC Card. Some host computers do not have an antenna, or already use the antenna for a WLAN. Special cards with integrated antennas are available upon request from WiData Corporation, although for optimum RF performance, it is recommended that the antenna integrated into the handheld computer be used.

Software (DOS)

The diskette has the Firefly Communicator application software as well as the library and configuration files required by card and socket services in order to recognize the PC Card and allocate the needed resources. Since most handheld computers require special software to download files to the hard disk, the PC Card files should be copied to a directory on the host computer that will be used to flash the handheld computer.

The handheld computer should be flashed with the WiData Firefly software. Consult handheld computer documentation for procedures on downloading files.

Software (Windows 95)

The diskette has the installation shield required to install all the software required to run the Firefly Communicator PC Card. From WINDOWS, select run a:\setup.exe. The install software will create a directory path on the root named \INTERROGATOR\GUI. The file TAGCONF.EXE is the application software.

Sounds

When the software and the hardware are correctly installed, the computer will produce two tones (medium pitch followed by higher pitch) when the PC Card is inserted or upon power up.

Operation

Configuration and Setup

The WiData Firefly Hand Held Communicator does not require any special configuration or setup to operate with the Firefly application software loaded on the handheld computer.

Operation

The WiData Firefly Hand Held Communicator application software should automatically run on power up of the handheld computer. Most applications allow the user perform one or more of the following functions:

- Read data from tag memory
- Write data to tag memory
- Turn tag DSSS blink on and set the blink rate
- Turn tag DSSS blink off
- List Ids of tags within the OOK/FSK range of the Hand Held Communicator
- Locate a specific tag by report the signal tag's OOK/FSK signal strength
- Upload data to the Firefly Data Base using DSSS transmit mode.

All application software is pre-configured to individual system requirements before system installation. All available functions are menu selectable through easy on screen instructions.

Specifications

PC Card

Dimensions	3.3 x 2.1 x 0.2 inches 85 x 54 x 5 mm
Weight	1.6 oz
Operation Temperature	0 to +55 °C
Storage Temperature	-20 to +85 °C
Humidity	95% non condensing
PCMCIA Compliance	Type II, Version 2.01 Card and Socket Services 2.1

DSSS RF Performance

Frequency	2441.750 MHz
Spreading (PN Code)	511 chips/bit
Chip Rate	30.521875 MHz
Power	<1mW
Range (to DSSS reader)	up to 200 feet

OOK/FSK RF Performance

Frequency	2446.520 MHz
OOK/FSK Rates	375 kHz (Logic 0) 535 kHz (Logic 1)
Power	<1mW
Range (to tag)	0 to 6 feet