Wireless Solutions

- Continuum of needs for wireless products
- No one product which can fill all needs
- Family of complementary devices

Targeted Applications

- Cable replacement (point to point)
  - Barcode scanner to portable/mobile computer
  - Printer to portable/mobile computer
- Personal area connectivity (peer to peer)
  - Hand held computer to numerous peripheral devices including scanners, printers, wide area network radios, etc.
Applications Solution Requirements

- Very low cost
- Low power consumption
- Small size
- Interference immunity
- Ease of use
- Standardized interfaces
- Unlicensed, international usability

Wire Replacement Concept

- Complementary to WLAN/IEEE 802.11 devices
  - lower range
  - lower throughput
- Lower complexity than WLAN devices
  - reduced RF specifications
  - reduced MACPHY complexity
- Features which do not add recurring costs
  - peer to peer with up to 10 nodes per PAN
Short Range Radio System
Sample Configurations

Personal Area Network

Infrastructured Network

• Personal Area Network (PAN; Peer-to-Peer)
  – Multiple Networks co-habitate (20 or more)
  – Up to 10 devices in a single PAN
  – Dynamic PAN and device IDs with network initiation
  – Network maintained devices coming and going
  – Temporary devices also supported
Short Range Radio System

Configurations

- Limited Infrastructured Network
  - Main device (access point) has power at all times (fast access)
  - Support for more than 10 devices
  - Ethernet access points with higher layer protocol
  - Communications to the NT Base (STAR Base)
  - Switch from PAN to LAN and back

Desirable Features

- Interface
  - Simple interface for intelligent and "dumb" devices
  - Dumb devices
    - Serial, RS232 like interface (19.2kbps)
  - Intelligent devices (Ability to establish and control net parameters)
    - Serial, RS232 like interface (up to 115.2kbps)
    - Parallel/PC Card optional
- Very Low Power Consumption
  - Minimized while not operating (e.g. 6mA or less)
  - Operational, fast, low power comm. (e.g. 80mA or less)
  - Very low full day average (e.g. 10mA avg. over 10 hours)
- Fast Response (Variable Speeds)
  - “Wired Response” (e.g. avg. response time under 125mS)
  - Various speeds for optimum response/range/current
  - CSMA/CA; collision sense/collision avoidance
Short Range Radio System
Desirable Features

• Immunity
  – Frequency Hopping to avoid fixed interferers and multipath
    interference
  – Able to coexist with other frequency hopping systems
  – Reduced range decreases the impact of co-located networks
  – High data rate reduces “air time”

• Size
  – Under 1/3rd the volume of typical 802.11 radios

• Cost
  – In mass production, should be under 25% of the projected cost
    of an 802.11 radio

Short Range Radio System
Desirable Features

• Non-licensed, ISM bands

• World Wide Regulatory
  – 2.4GHz frequency hopping: ETSI 300 328
  – Low power output: FCC Part 15.249
  – Japan: RCR 33