

**code**

**iNEMI**

**SMT Reel Labeling Project Workshop**

**April 27, 2005 Fort Worth, Texas**

## AIDC with Code Corporation

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- Imaging Expertise to Develop Multi-Purpose, Low-Cost Imagers that Outperform Laser or VGA Engines
- Wireless Expertise – Introduced World's first Bluetooth Enabled 2D Imager
- Form Fit and Function Engineering – Products that Fit the New Mobile Worker
- Revolutionary Software Platform - CodeXML™
- Open and Private Symbologies
  - Trading Partner Interchange
  - Protection of Data



## CR2: Symbology Support

Decodes over 20 of the most widely used linear and 2-dimensional symbologies including:



PDF 417



Micro PDF 417



Data Matrix



QR Code



MaxiCode



Codablock



RSS Limited



RSS Stacked 14



1 234567 890128

EAN/JAN



1 23456 78901 2

UPC



12345678

Code 39



12345678901234

Code 128



I 2 of 5



GoCode

**SwiftDecoder:™** Operational and field proven for over seven years

## Laser Scanner versus Imager

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- **Lasers do a great job on width-modulated linear symbols**
  - Return a direct reflection of the symbol
  - Decode as they go
  - Costs driven down by Compact Disc products
- **Lasers can't "see" a matrix symbol**
- **Reliability issues related to electro-mechanics of laser**
- **20 year reign is ending due to imager capabilities:**
  - No moving parts in reading assembly
  - Digital camera, cell phone, PDA component drivers

## Linear Imager Versus 2D Imager

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- **Linear Imagers (CCD) do a great job on linear symbols**
  - Take a wide, skinny picture
  - Decode as they go
  - Costs driven down by copy machine/scanner products
- **Linear Imagers can't "see" a matrix symbol**
- **No reliability issues related to electro-mechanics**
- **Working range limited and no omni-directional reading**
- **CCD's use high amount of power, makes portability a problem**

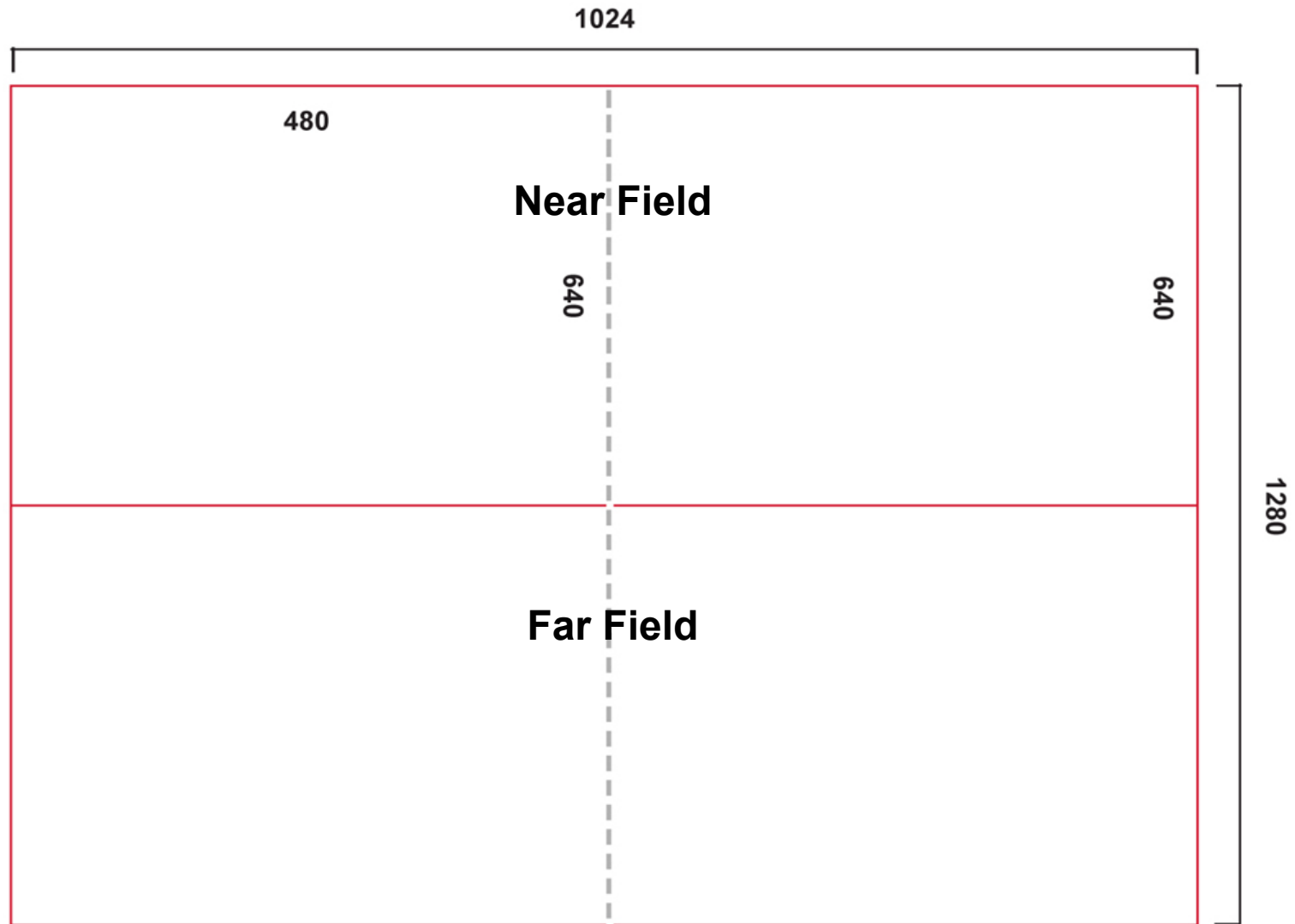
## 2D Imager Technology

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*2D Imagers process a digital photograph, find and decode data*

- **CCD versus CMOS**
  - CCD was original 2D technology
  - High power consumption makes portability problematic
  - Good dynamic range in center visible light spectrum
- **VGA (300K pixel) resolution limitations**
  - Working range
  - Size of Symbol (field of view)
- **CMOS has different spectral performance**
  - Illumination technology
  - Filtering of ambient light
  - Low power consumption is great for portable operation

# CR2: 1.3 Million Pixel Imager Pixel Resolution (SXGA)



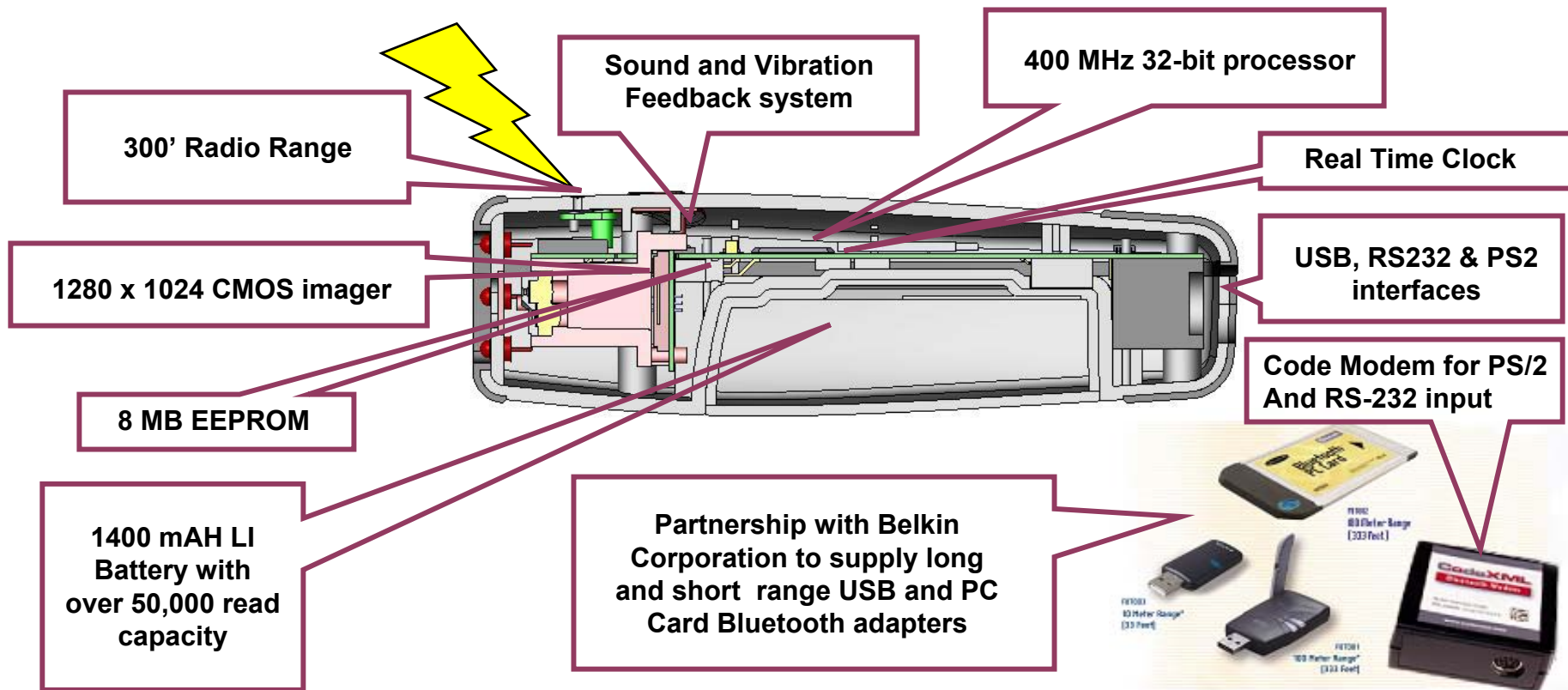
## 2D Imager Technology: Portability

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- **CMOS uses very little power**
  - True digital device uses less circuitry
  - Spectral performance advantage
- **Low Power CPU required**
  - 400 MHz CPU with low energy usage
  - “Sleep” strategy
- **LilION Batteries from Cell Phones**
  - Good recharge cycle characteristics
  - Environmentally benign
- **Bluetooth Radio**
  - Protocols designed for low energy use
  - Proliferation of low cost radios

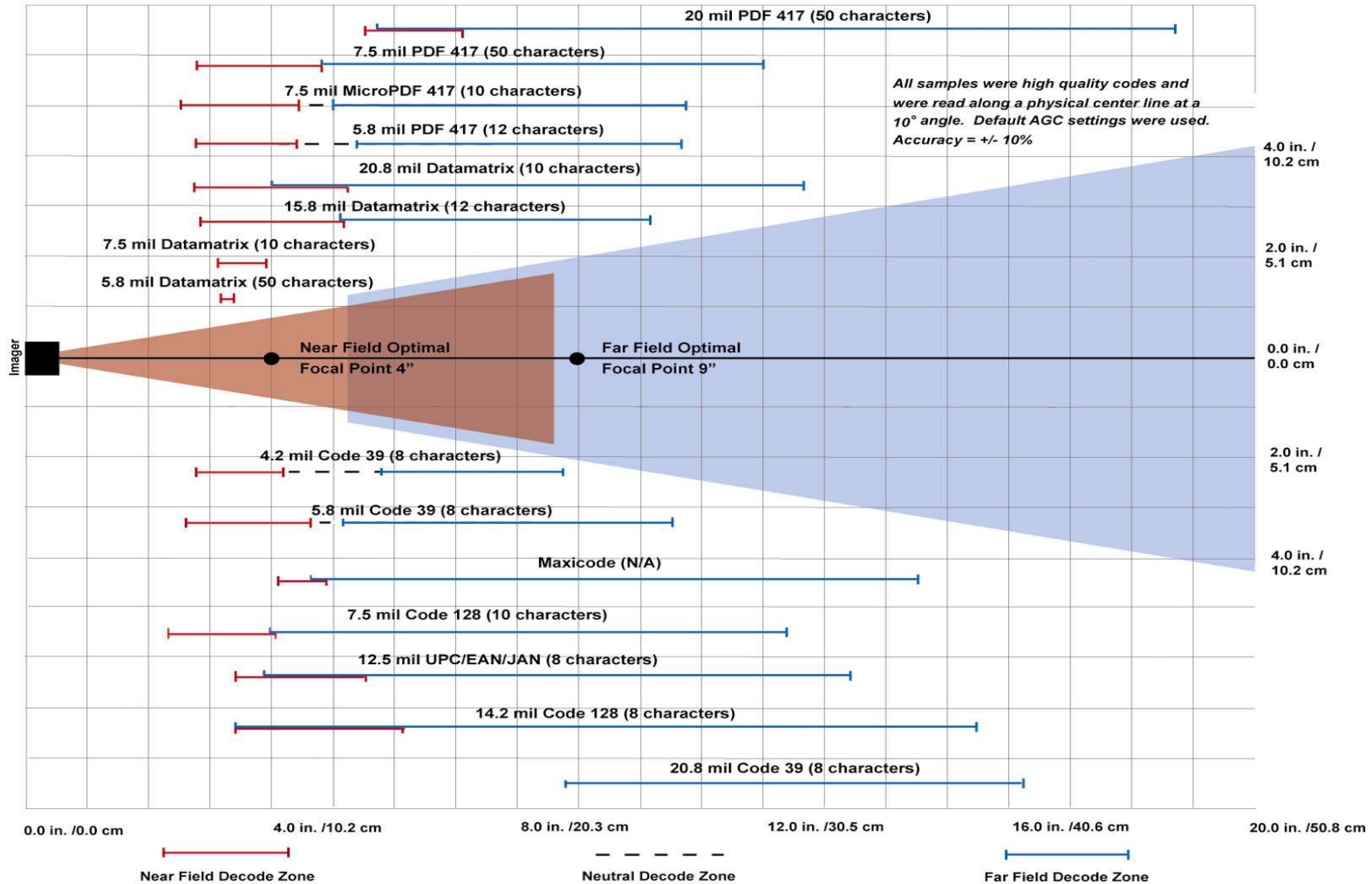
# CR2 – Cabled, Batch & Wireless

The CR2 features a 1.3 megapixel CMOS sensor, high speed imbedded CPU and innovative dual field optics. CR2 makes non-cabled store-and forward operation available by adding a 1400mAh or 1950 mAh Lithium Ion battery. More than 2 MB of memory is available to store thousands of readings, included date and time stamp. The CR2 is available with a Bluetooth Class 1 radio module.



# CR2: Multi-Application Reading

CR2 features simultaneous near-field and far-field decoding



## Reading in the real world

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- **More Pixels on Target**
  - Robust error recovery
  - Time to process is longer on bad symbols
  - Working range is diminished on bad symbols
- **Code Readability Index**
  - Provides score (1-100) based on difficulty of read
  - Applicable to all symbologies
  - Is specific to Code Reader and SwiftDecoder™
- **Labels (black on white) are “easy”**
  - Direct marks require additional capabilities
  - Illumination and dynamic range strategies
  - MicroScan adds capabilities to product

## Code System Components

- Hardware
  - Code Readers



- Accessories



- CodeXML™ Software



- 2-Dimensional Symbologies



## The Code Reader 2.0 (CR2)

The CR2 provides a single architecture for palm-held, gun format, cabled, batch and cordless reader applications.

- All-Applications Capable
- Low Cost
- Field Upgradeable
- CodeXML Ready
- Bluetooth
- USB
- RS-232
- Keyboard



# CR2: Hand Format or Gun Format



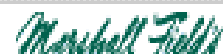
## Early Adopters: Markets and Applications

### Electronics Manufacturing

- Distribution Center Inventory Control
- Receiving, Cycle Count, Shipping
- Support of EIA and DoD UID 2D Data Matrix Symbols
- Eliminated 25' Cables
- Provided Feedback in Noisy Environment with Vibrate Feature
- Eliminated Expensive Portable Data Terminals for Cycle Count
- Single Reader for High Density Data Matrix *and* Wide Linear Codes
- Single Reader for All Communications Interfaces



# CR2 Early Adopters and Channel



# MICROSCAN.

Automated Bar Code Scanners

## Code Corporation

Code designs, develops and manufactures innovative Auto ID and Data Collection products. Incorporating multi-functional imagers in its reader hardware and providing unsurpassed flexibility in its open-platform CodeXML software, the Code Corporation supplies Auto ID users a complete set of tools to manage data collection using the latest Internet-based systems. Its worldwide headquarters are located in the Salt Lake City, Utah metropolitan area.

