XILINX®

Screen Phones

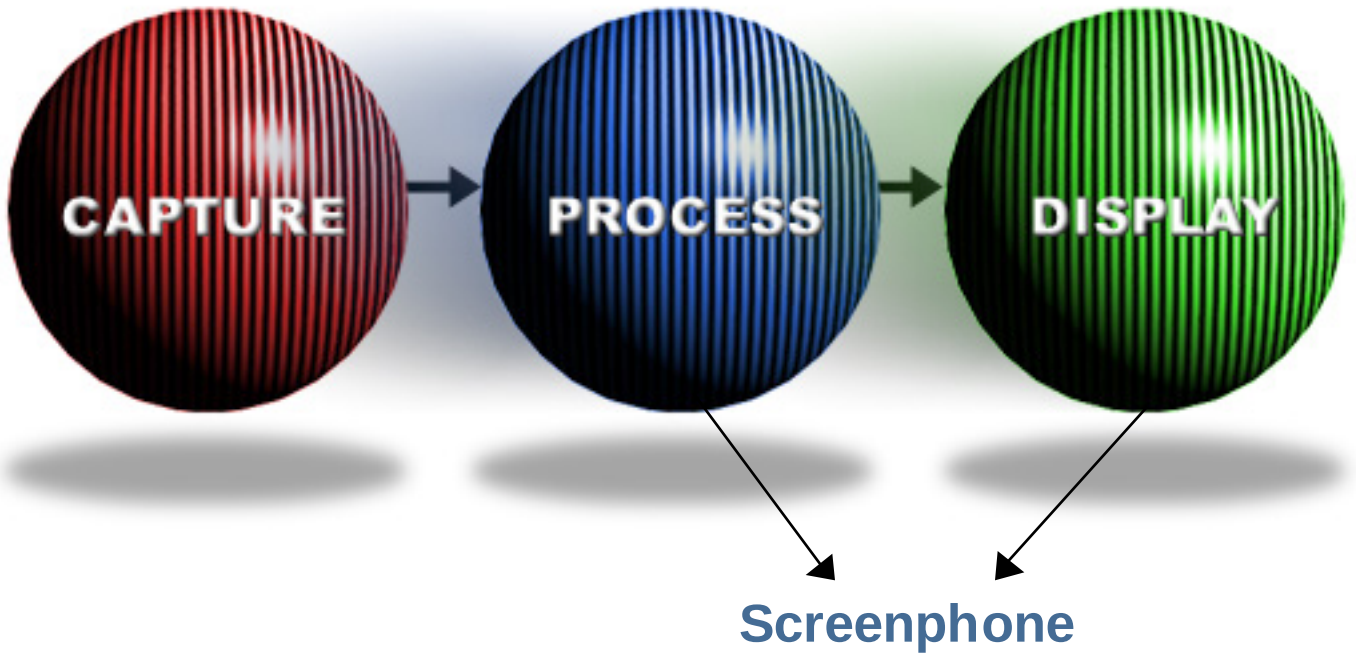
SPARTAN®-IIE FPGA

esp EMERGING STANDARDS & PROTOCOLS

Agenda

- Introduction
- Market
- Xilinx Spartan-IIE FPGA solutions
- Summary

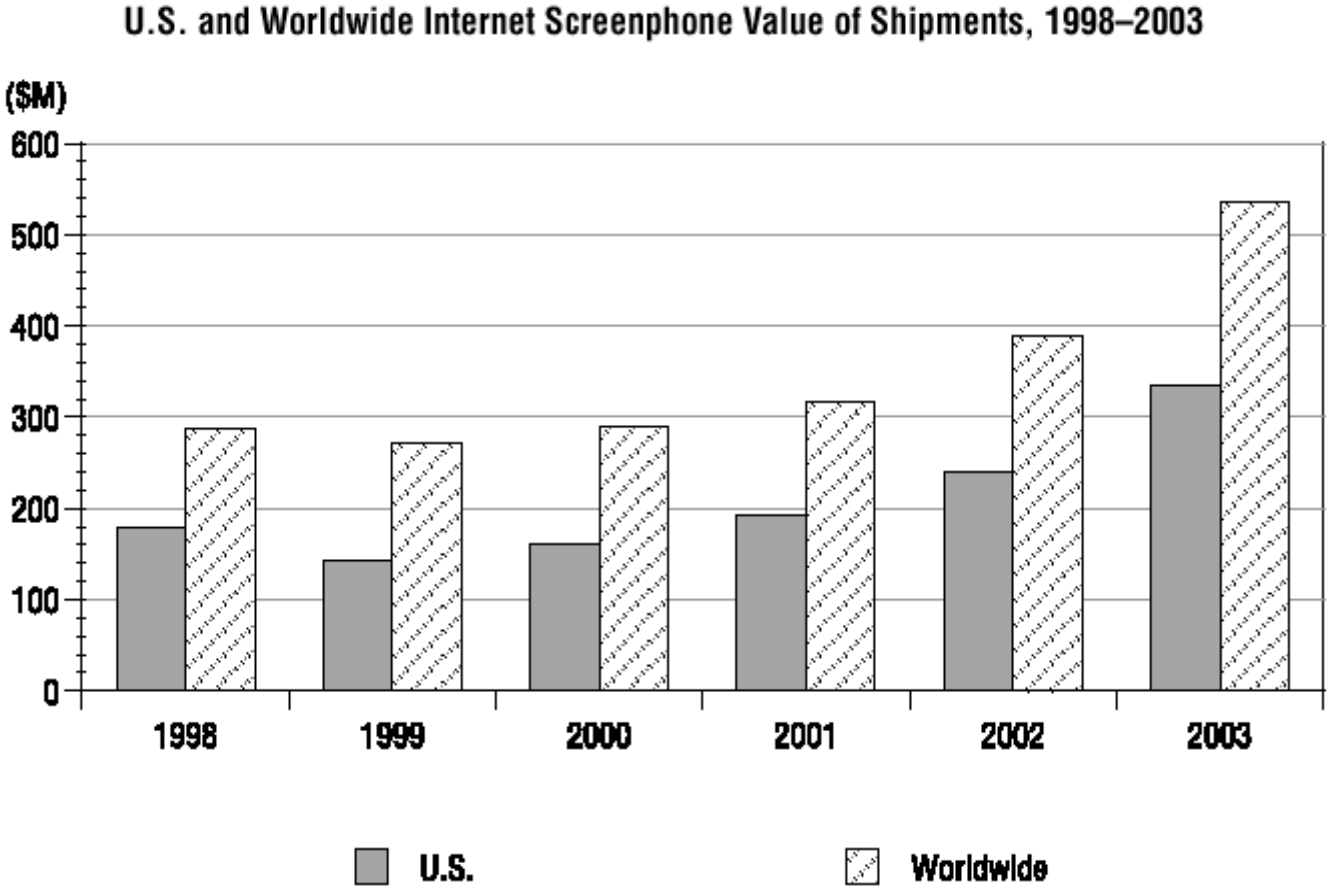
DVT Theme



Internet Screenphones

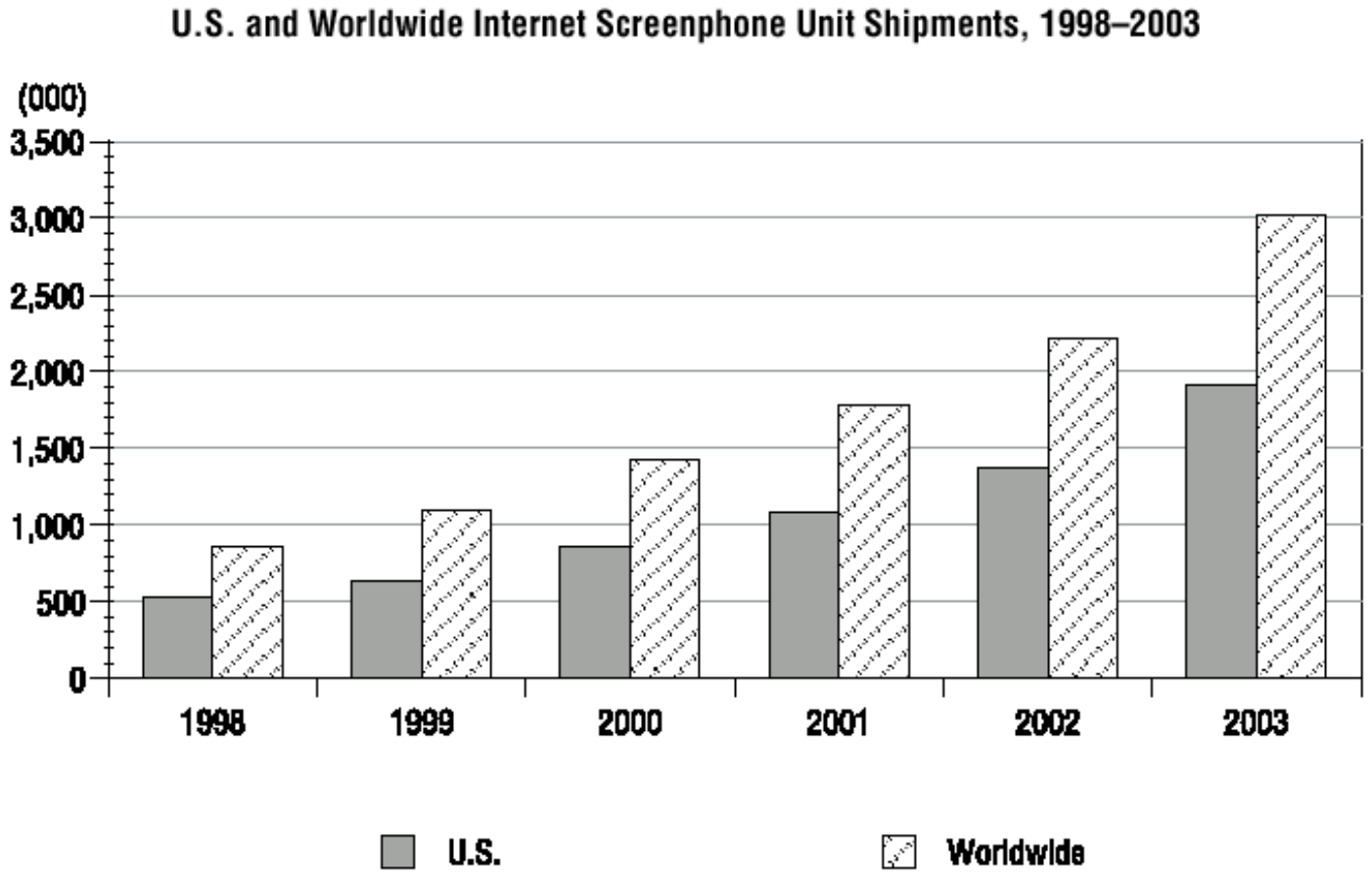
- Type of information appliance built around a telephone-like form factor
  - High end desktop telephones with LCD screens
  - Offer Internet access for email message checking and informational services and/or Web browsing
  - Includes
    - Base module
    - Voice communications module (corded or cordless handset and/or speakerphone)
    - Keypad
    - Screen display

Internet Screenphones Shipments



Source: International Data Corporation, 2000

Internet Screenphones Shipments



Source: International Data Corporation, 1999

Internet Screenphones Categories

- Three key screenphone product categories
  - Low-end products (Range $100 - 150)
    - Use a very small LCD display
    - Provide the most basic access to limited Internet content such as text email or news
  - Midrange products (Range $199 - 399)
    - Larger screen with a miniature keyboard
    - Interactive email or news feeds from the Internet
      - Web-browsing capabilities are limited
  - High-end products (Range $400+)
    - Color screen of 7 to 8 inches with graphics & touch-screen capabilities
    - Email, web browser

Growth Accelerators for Internet Screenphones

- More vendors with more products, leading to competition
- Big vendors with large marketing departments help validate the screenphone concept & help in promotion
- Increasing demand for Internet at multiple points in the home
- Service provider distribution and promotion of devices

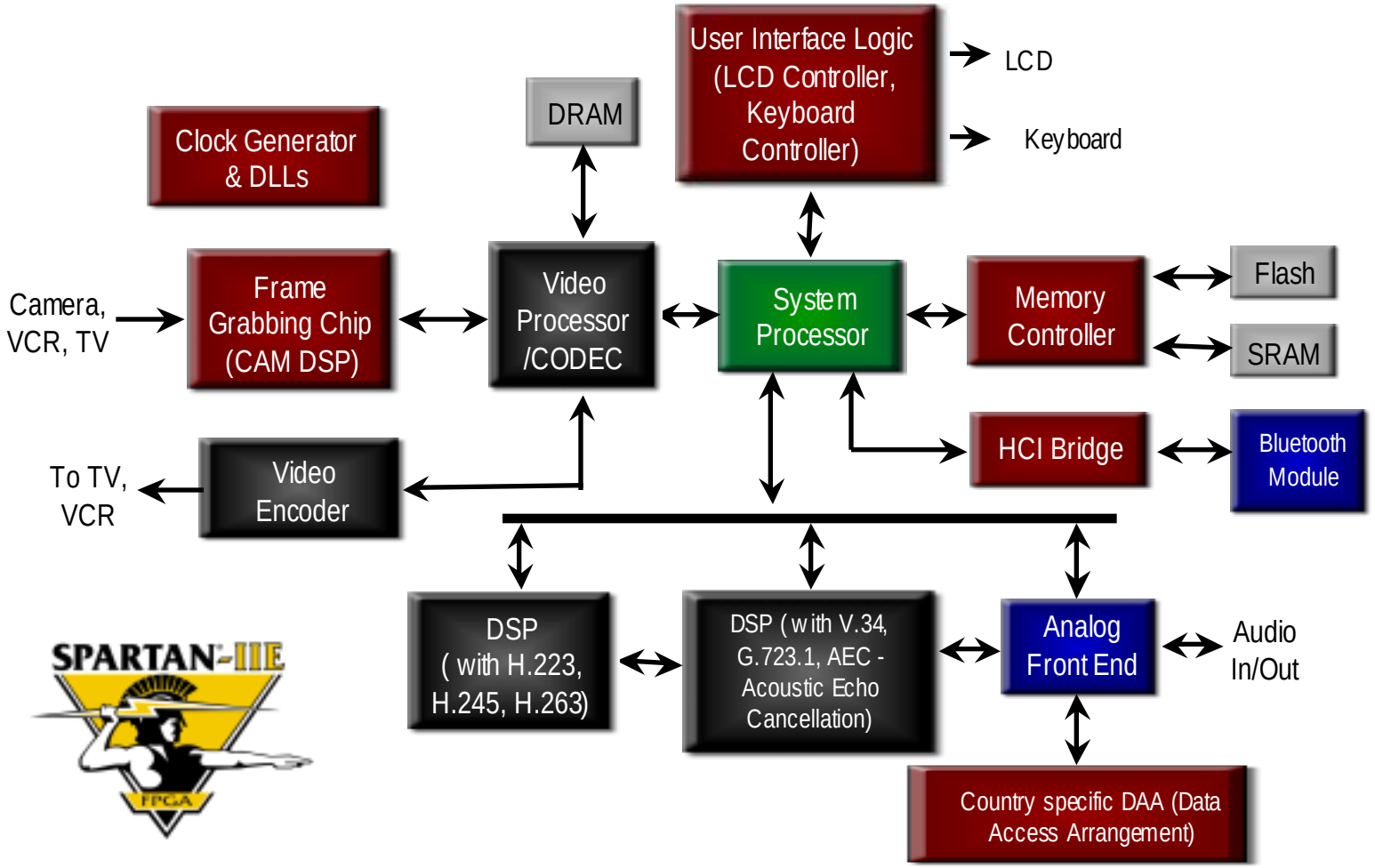
Growth Inhibitors for Internet Screenphones

- Uncertain business model
- Shift to IP resulting in higher bill of materials
- Minimal consumer awareness
- Lack of a killer application
- Competing information appliances
- Issues with form factors
  - Small screens, smaller keyboards, large physical sizes

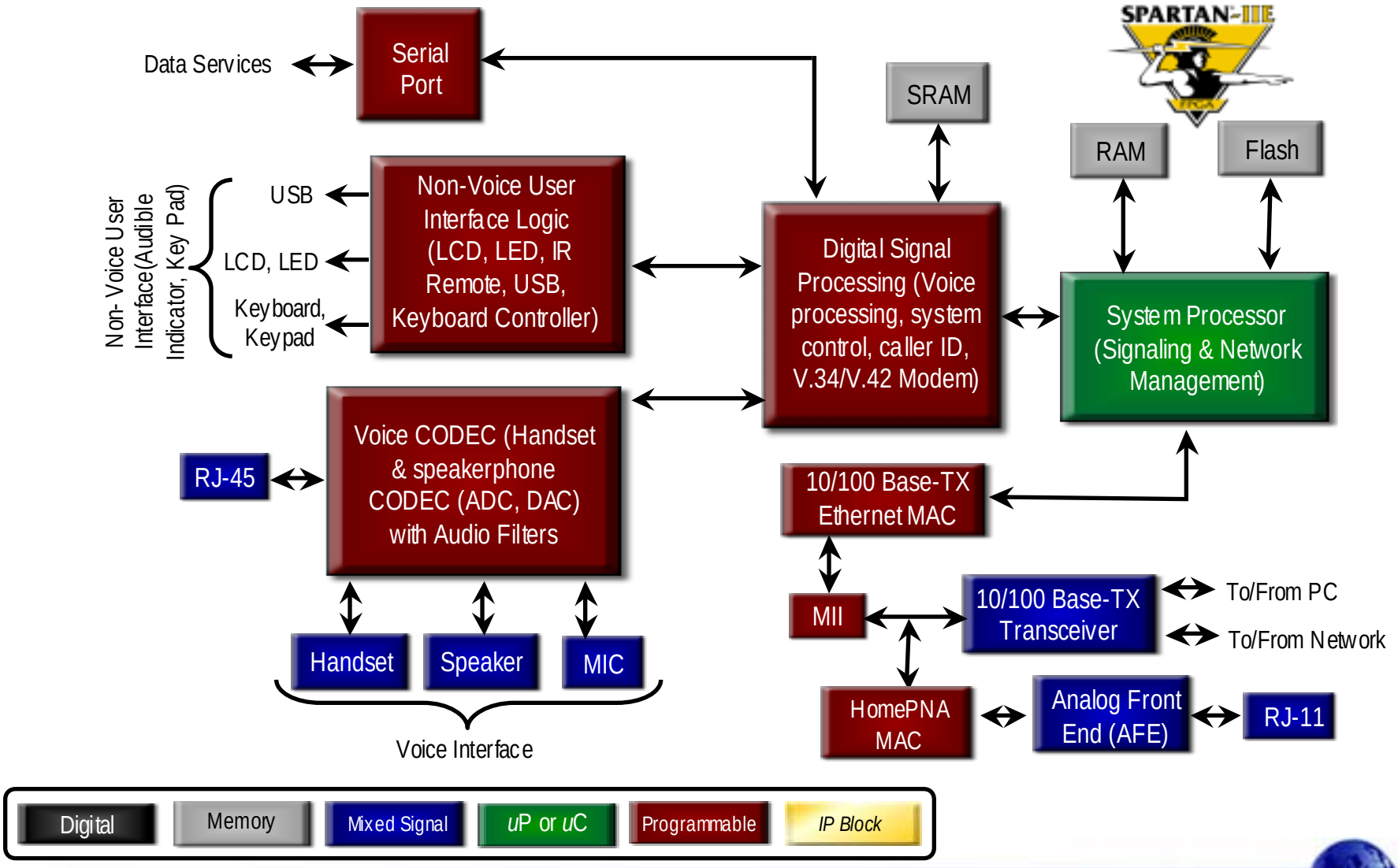
Trends

- Touchscreen control
- Biometric security features
- Speech recognition
- Evolving standards in security and data processing
- Advanced LCD technology

Digital Video Phone



VoIP Phone


Data Services
Serial Port
SRAM
SPARTAN-IIE
RAM
Flash
Non- Voice User Interface(Audible Indicator, Key Pad)
USB
LCD, LED
Keyboard, Keypad
Non-Voice User Interface Logic (LCD, LED, IR Remote, USB, Keyboard Controller)
Digital Signal Processing (Voice processing, system control, caller ID, V.34/V.42 Modem)
System Processor (Signaling & Network Management)
RJ-45
Voice CODEC (Handset & speakerphone CODEC (ADC, DAC) with Audio Filters
10/100 Base-TX Ethernet MAC
MII
10/100 Base-TX Transceiver
To/From PC
To/From Network
Handset
Speaker
MIC
Voice Interface
HomePNA MAC
Analog Front End (AFE)
RJ-11
Digital
Memory
Mixed Signal
uP or uC
Programmable
IP Block

Xilinx IP for Video Phone

- System Logic
- Clock Distribution - DLLs
- SDRAM Interface
- FLASH Memory Adapter
- Power Management
- Error Correction
  - Reed Solomon, Viterbi
- HDLC Controller
- FIR Filter
- DCT/IDCT MPEG
- Compact Display Control
- Keyboard Control
- I/O Control
  - HCI Bridge
  - PCI
  - USB Controller
  - UART
  - IEEE-1394

IP for Compact Video/ Display Control

- Provided by Xylon - AllianceCore member
- Features
  - Compatible with Xilinx Core Generator tool
  - 128x64 to 1024x768 display resolution
  - Support for single and double panel displays
  - Gray and color shades
    - Up to 4 gray levels or 256 colors for STN displays
  - Programmable display data bus: 1, 2, 4 or 8-bits
    - 16-bit data support with an external register
  - Supports Electroluminescent, Plasma, LCD and CRT displays
  - Support for two video pages
  - Hardware or software controlled CPU to video memory access

Applications & Functional Blocks

- Applications for the compact video controller IP ported on Xilinx low-cost FPGAs include
  - PDAs and handheld PCs
  - Auto PCs
  - Set-top boxes
  - Human machine interfaces
  - Video-phones and screen phones
- Functional blocks
  - Video memory access block
  - Video control register block
  - Clock generator unit
  - Video data scrambler
  - Video display synchronization signals generator

Summary

- Screenphones are the next step in the evolution of personal communication
  - Built around a telephone-like form factor
  - Includes base module, voice communications module, keypad and screen display
- Screenphones face traditional issues with products serving needs of digital convergence marketplace
  - Time-to-market pressures, market fragmentation, increasing need to interface to other products
- Xilinx fit in Screenphones
  - CCD interface, timing generation, memory controllers, hjard disk interface, display interface, and system control