The RC240 package provides a desktop environment for designers of advanced imaging and signal processing systems using a combination of programmable logic and ARM microprocessor for applications such as digital entertainment and communications, in-car infotainment, robotics and machine vision.

**BENEFITS**

- High performance FPGA for manipulation of high-speed Video and data streams
- Integrated ARM 922T processor
- Experimental features including 3-axis accelerometer and high speed DAC & ADC
- High-speed bit file loading and RC240 / Host integration through USB and Gigabit Ethernet
- Easy to use in combination with Agility's DK Design Suite, PAL and DSM technologies
- Rapid development of imaging applications using PixelStreams

**MAJOR FUNCTIONALITY**

- Xilinx Virtex-4 FPGA (XC4VLX40-10)
- ARM 922T CPU (Sharp LH7A404)
- Memory
  - 3 banks 1M x 36bit Pipelined ZBT SRAM
  - 128MB DDR SDRAM (for FPGA)
  - 128MB SDRAM (for ARM CPU)
- Video sub-system
  - Camera Link input
  - On-board CMOS camera (optional)
  - VGA / DVI output (UXGA / 1080p)
  - 8.1" touchscreen LCD (optional)
- Gigabit Ethernet PHY
- USB
  - Full-speed to FPGA via Cypress FX2
  - Device interface to ARM
  - 2 x host interface from ARM
- ADC - 65MS/s 10bit x 2
- DAC - 125MS/s 10bit x 2
- 3-axis accelerometer
- CAN Bus
- RS232
- SDIO
- Programmable PLLs

The RC240 board includes a 4M Gate Xilinx Virtex-4 LX40 FPGA with direct access to 12M bytes of pipelined ZBT SRAM and 128M bytes of DDR SDRAM. A Sharp LH7A404 is fitted featuring an ARM922T CPU, connected to the FPGA via the EBI bus. The ARM is provided with another 128MB of SDRAM for its private use and USB host and device ports.

Imaging and video capabilities are provided by the CameraLink video input and optional on-board CMOS camera. Both digital and analog video outputs, capable of pixel frequencies up to 165MHz are provided via a DVI-I connector. An optional 1024x768 8.1-inch TFT/touchscreen is available.

Communications are provided by a Gigabit Ethernet PHY and 10/100/1000baseT socket offering capability for data streaming, data distribution and high performance network applications. The board also offers a USB 2.0 connection for high-speed file transfer and host to FPGA application communications. The board is equipped with RS232 ports connected directly to both FPGA and CPU to assist with development.

For user interaction, eight status LEDs, a four digit seven segment display, two push buttons, a digital joystick, an optional touch screen and PS2 mouse and keyboard ports provide many possibilities.
Configuration files and user data may be stored together on a FAT formatted SD card, accessed via the dedicated microcontroller, giving the FPGA the ability to self-reconfigure. This enables a stand alone-system to be realized. A 1GB SD card pre-programmed with many demonstration files is provided with the RC240.

To enable the development of innovative applications the board also features a 3 axis accelerometer, dual channel 65Msps A to D converter inputs and 125Msps dual channel D to A converter outputs, CAN bus, 4 servo control outputs, an FPGA compatible expansion port and an SDIO card socket to accommodate other I/O requirements such as WiFi or Bluetooth.

The RC240 package provides the following features:

- Virtex 4 4VLX40-10 FPGA
- Gigabit Ethernet PHY with 10/100/1000baseT socket
- 3 banks 1M x 36 bit pipelined ZBT SRAM
- 1 bank 32M x 36 bit DDR SDRAM
- Video support including:
  - Camera Link input
  - CMOS Camera (optional)
  - Combined VGA / DVI output
- Optional 8.1" 1024 x 768 LCD touchscreen
- AC97 compatible Audio
  - On-board microphone
  - Line-level input (Stereo)
  - Line / Headphone output (stereo)
  - On board stereo speakers
- SD card (removable) for configuration / data files
- SDIO card socket (separate from above)
- Cypress FX2 microcontroller for:
  - USB 2.0 port management
  - FPGA configuration / reconfiguration
  - SD card file management
  - RS232 port (via level shifter to FPGA)
- PS2 x 2 (keyboard / mouse)
- User-programmable (white) LEDs x 8
- Seven-segment displays (red) x 4
- 2 momentary contact switches
- 5 way mini-joystick
- 50 pin expansion header including:
  - 33 general I/O pins (layout / electrically compatible with ATA UDMA-4 or higher)
  - 3 power pins (+12V, +5V, +3.3V)
  - 2 clock pins
- 4 servo connectors (3-way headers)
- CAN bus connector
- Dual channel 10-bit 65MS/s ADC
- Dual channel 10-bit 125MS/s DAC
- JTAG connector
- Sharp LH7A404 ARM 922T device processor with:
  - 128MB SDRAM
  - USB host port
  - USB device ports x 2
  - RS232 port (via level shifter to inbuilt UART)
  - JTAG
  - GP (green) LEDs x 4
- Acrylic (3mm, blue tinted) upper and lower covers
- Universal 110/240V power supply
- Pre-programmed 1GB SD Card including:
  - Configurable menu program
  - Technology demonstrator programs
  - Test program

Software features include a PAL (Platform Abstraction Layer) implementation allowing Handel-C developers to access board features using the portable PAL API (Application Programming Interface). Supporting the PAL implementation is a comprehensive Platform Support Library (PSL) – a set of board specific Handel-C device drivers allowing lower level access to board features. Utilities are provided to download configuration files and control the board for Microsoft Windows XP.

The platform is available with a suite of electronic system level (ESL) design software and the powerful PixelStreams library for ultra-rapid development of video image streaming applications featuring over 140 parameterizable video and imaging IP cores.

The RC240 package includes the Agility Platform Developer’s Kit which provides:

- Platform Support Library for RC240*
- Platform Abstraction Layer for RC240*
- FTU file transfer utility (for Windows 2000 and Windows XP)

Note: The RC240 package does not include any software for programming or debugging the ARM processor.

*Requires DK Design Suite