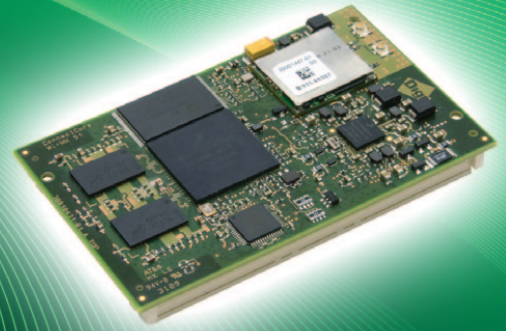


PRELIMINARY

ConnectCore™ Wi-MX51

High-End Core Module with Wired and Wireless Network Connectivity



High-end Cortex-A8 System-on-Module solution delivers industry-leading performance, low-power operation, and fully integrated 802.11a/b/g/n + Ethernet networking.

Overview

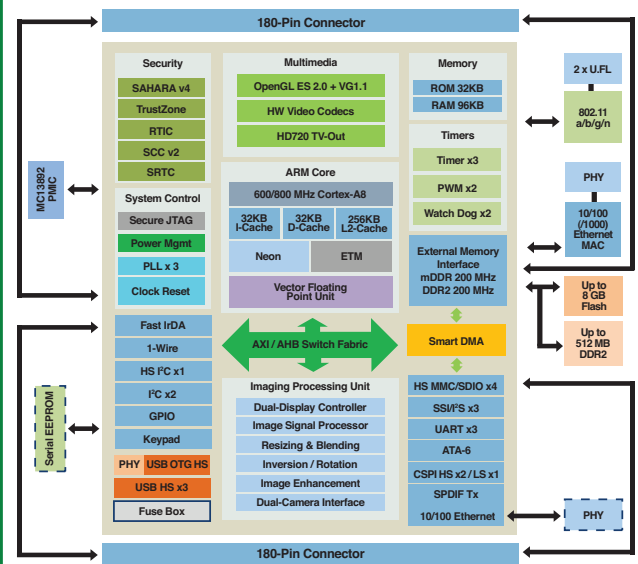
The network-enabled ConnectCore Wi-MX51 is a highly integrated and future-proof System-on-Module (SOM) solution based on the new Freescale® i.MX51 application processor, which offers high-performance ARM® Cortex-A8® core, powerful multimedia options, and a complete set of peripherals.

The module combines the fast integration, reliability and design flexibility of an off-the-shelf SOM with complete out-of-the-box software development support for platforms such as Microsoft® Windows® Embedded CE 6.0 and Digi® Embedded Linux.

With industry-leading performance and key features such as a dual-display interface and a hardware encryption engine, the module is the ideal choice for a broad range of target markets including medical, digital signage, security/access control, retail, industrial/building automation, transportation and more.

Complete and cost-efficient Digi JumpStart Kits® allow immediate and professional embedded product development with dramatically reduced design risk and time-to-market.

Block Diagram



Features/Benefits

- High-end, low-power 32-bit System-on-Module
- Integrated 10/100/(1000) Mbit Ethernet networking
- Pre-certified 802.11a/b/g/n wireless LAN interface
- On-chip hardware encryption engine
- High-definition multimedia with hardware acceleration
- Industrial operating temperature available
- Low-emission design with FCC Class B compliance
- ZigBee®, cellular, and satellite connectivity options
- Complete Microsoft Windows Embedded CE 6.0 and Linux platform support with full BSP source code

Related Items



Design Services



Accessory Kits



Support



Supported Software Platforms



Development Kits

Digi JumpStart Kits Overview

Digi JumpStart Kit for Embedded Linux

Built around a standard Linux 2.6 kernel distribution, the Digi JumpStart Kit for Embedded Linux is tailored to the specific needs of embedded Linux development and provides an easy-to-use, complete off-the-shelf embedded development platform. It includes all components that required to build secure network-enabled products based on the ConnectCore Wi-MX51.

The kit includes Digi ESP™ for Embedded Linux, a powerful and fully Linux-hosted Integrated Development Environment based on the open Eclipse™ framework. Ideal for new and experienced Linux developers, Digi ESP improves software design productivity by accelerating and greatly simplifying driver and application development through a user-friendly graphical interface.

- Complete Linux development platform for embedded systems
- Royalty-free and with optimized 2.6 kernel and services support
- Linux-based Digi ESP IDE for rapid product development
- Full Linux and Digi Board Support Package (BSP) source code included



Digi JumpStart Kit for Microsoft Windows Embedded CE 6.0

Microsoft Windows Embedded CE 6.0 is a highly componentized operating system, offering pre-tested technology components designed to create sophisticated embedded applications with minimized design effort and risk. It includes a wide range of ready-to-use components such as a graphical user interface, networking, web browser and multimedia. The professional Microsoft Visual Studio 2005 development tools also support native and managed code applications using various programming languages.

The Digi JumpStart Kit for Microsoft Windows Embedded CE 6.0 provides a complete kit with all hardware and software components needed to start immediate software development on the ConnectCore Wi-MX51 module platforms. This includes support for all processor platform features such as power management, multimedia interfaces, and other peripherals.

- Complete kit for immediate Windows Embedded CE 6.0 R3 development
- Seamless integration into Microsoft Windows Embedded CE environment
- Full Digi Board Support Package (BSP) source code included
- 180-day Visual Studio 2005 and Windows Embedded CE 6.0 evaluation



Digi JumpStart Kit Contents

| Software Platform | Embedded Linux | Microsoft Windows Embedded CE 6.0 |
|--------------------------------|--|---|
| Module | ConnectCore Wi-MX51 w/ 512 MB NAND Flash, 512 MB DDR2 | |
| Development Board | 3 serial ports (1 x RS-232/422/485, 1 x RS-232 Tx/Rx, 1 x TTL), VGA interface, HDMI 1.3 interface, external LCD/Touchscreen connectors, external camera connectors, user/application connectors, Ethernet connector, WLAN antenna connectors, SD/MMC slot, MicroSD slot, USB OTG, 4 x USB Host, I2C/SPI headers, 1-Wire connector, audio: line in/out and microphone in (3.5 mm), Digi XBee module socket (module sold separately), GPIO screw terminal, user push-buttons, user LEDs, battery, 802.3af (PoE) module socket (module sold separately), JTAG connector, 9-30VDC power supply, power switch | |
| CD/DVD | Digi Embedded Linux with Live DVD support, Eclipse-based Digi ESP IDE, Linux and platform specific source code, Universal boot loader source code (U-Boot), sample code, documentation | Digi Windows CE 6.0 CD: Microsoft Windows Embedded CE 6.0 BSP w/source code, Universal Boot Loader (U-Boot) source code, sample code, documentation Microsoft Embedded Windows CE 6.0 R3 evaluation DVD: 180-day trial of Microsoft Embedded Windows CE 6.0 R3, Platform Builder, Visual Studio 2005 |
| Documentation | Quick start guide, Digi Embedded Linux user's guide, hardware reference manual, development board schematics | Quick start guide, Digi Windows CE 6.0 BSP user's guide, hardware reference manual, development board schematics |
| Power Supplies and Accessories | External wall power supply with interchangeable outlet adapters (North America, EU, UK, and Australia), Ethernet cable, serial cable | |
| Part Numbers (Ethernet + WLAN) | CC-WMX51-LX | CC-WMX51-CE6 |
| Part Numbers (Ethernet only) | CC-MX51-LX | CC-MX51-CE6 |

Please refer to the feature specs on the Digi website for detailed information about the specific software platform capabilities.

| Processor | |
|---------------------------------------|--|
| Processor Model | Freescale i.MX51 |
| Speed Grades | 600/800 MHz |
| Core Type | ARM Cortex-A8 |
| Cache Memory | 32k L1 I-Cache, 32k L1 D-Cache, 256k L2-Cache (unified) |
| Internal RAM | 128 KB (secure/non-secure) |
| Vector Floating Point | • |
| NEON Media Acceleration | • |
| Memory | |
| Flash | Up to 8 GB NAND flash |
| RAM | Up to 512 MB DDR2 |
| Debug | |
| Secure JTAG | • |
| ETM/ETB | • |
| Power Management | |
| Power Modes | Run, Wait, Stop, Low-power screen refresh |
| Wake-up Events | GPIO, keypad, RTC (day/time of day), SD card/USB cable insertion, battery/charger attach |
| Dynamic Voltage and Frequency Scaling | • |
| Backlight Drivers | 3 |
| Battery Management | • |
| Real Time Clock | |
| Battery Backup | • |
| Security | |
| Hardware encryption/decryption | AES, DES/3DES, RC4, C2 RSA, ECC MD5, SHA-1/224/256 |
| Random Number Generator | • |
| Run Time Integrity Checker | • |
| Secure RAM (internal) | • |
| Fuse Box (e-Fuses) | 64 Bits (application-specific use) |
| Physical Tamper Detectors | • |
| Timers | |
| General Purpose Timer | 32-bit up-counter with clock source selection 2 input capture channels 3 output compare channels, forced compare |
| Enhanced Periodic Interrupt Timer | 32-bit down-counter with clock source selection Set-and-forget/free-running modes Precision interrupt generation |
| Watchdog | • |

Specifications

ConnectCore™ Wi-MX51

| Connectivity | |
|---------------------------|---|
| UART | Up to 3 channels with bit rates up to 4 MHz, IrDA 1.0 support |
| IrDA Infrared | Medium InfraRed (0.576/1.152 Mbps), Fast InfraRed (4 Mbps) |
| CSPI | Master and slave mode Bit rate up to 25 Mbps (master) |
| eCSPI | Up to 2 eCSPI channels, master and slave mode Bit rates up to 66.5 Mbps (master) |
| I ² C | Up to 3 channels, master/slave (7-/10-bit addressing) All: Standard (100 kbps) and fast (400 kbps) mode |
| HS-I ² C | Master/slave (7-/10-bit addressing) Standard mode (100 kbps), fast mode (400 kbps) mode, high-speed mode (3.4 Mbps) |
| SD/SDIO/MMC | Up to 4 ports, 1-/4-/8-bit modes MMC: Up to 416 Mbps (8-bit mode), SD/SDIO: Up to 200 Mbps (4-bit mode) CE-ATA mode support (1 port) |
| P-ATA | Up to 66 MB/s data rate PIO mode (0,1,2,3,4), multi-word DMA mode (0,1,2), Ultra DMA mode (0,1,2,3,4,5) |
| USB 2.0 High-Speed | Up to 3 USB 2.0 High-Speed Host ports (transceiver-less) Up to 1 USB 2.0 OTG port with PHY |
| MIPI SLIMbus | Up to 28.8 MHz |
| 1-Wire | • |
| ISO 7816 (SIM/Smart Card) | • |
| Keypad | 8x8 keypad matrix |
| PWM | 2 |
| ADC (10-bit) | Up to 4 channels |
| GPIO | Up to 128 GPIOs |
| External Memory Bus | • |
| Multimedia | |
| Camera | 2 camera ports Bayer RGB, Full RGB, YUV 4:4:4, YUV 4:2:2, Gray scale, Generic data Parallel interface (up to 522 Mbps) or fast serial interface (up to 1.44 Gbps) Fast serial: Up to 6M pixels @ 15 fps (Bayer), Parallel: Up to 8M pixels @ 15 fps (Bayer) Window-of-interest selection, frame rate reduction, color depth reduction |
| Display | Primary and secondary display support / TV out (SD/HD) Up to 24 bit color depth, software contrast control Up to XGA (1024x768) @ 100 fps/720p (1280x720) @ 60 fps/1080i (1920x1080) @ 30 fps 3-/4-/5-wire serial interface, parallel, parallel bidirectional, DSI (4 lanes/4 channels) |
| Image Processing Unit | Image enhancements, video/graphics combining, resizing, rotation/inversion, color conversion/correction |
| Video Processing Unit | MPEG-4, H.263, H.264, MPEG-2, VC-1, DivX, RV10, MJPEG |

Not all signals available at the same time due to muxing dependencies. Please refer to user documentation for more information.

• Module Feature

| Multimedia (cont'd) | |
|--------------------------------|---|
| GPU (2D/3D) | 227 million triangles/sec, 166 million pixels/sec raw OpenVG 1.0, Open GL ES Common Profile v1.0/v1.1/Direct3D Mobile, Open GL ES Profile v2.0 |
| Touchscreen Interface (4-wire) | • |
| SPDIF (Tx) | • |
| I2S/AC97/SSI | Up to 3 channels |
| Ethernet | |
| Physical Layer | 10/100Base-T |
| Data Rates | 10/100 Mbps, auto-sensing |
| Duplex Mode | Full or half duplex, auto-sensing |
| Power over Ethernet (802.3af) | |
| Power Over Ethernet | Development board ready for 802.3af PoE application kit (sold separately) |
| Wireless LAN | |
| Standard | 802.11a/b/g/n |
| Antenna Connectors | 2 x U.FL |
| Dual Diversity | • |
| Frequency Bands | 2.412 - 2.484 GHz |
| | 4.900 - 5.850 GHz |
| Data Rates | 802.11b: 1, 2, 5.5, 11 Mbps |
| | 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps |
| | 802.11n: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps (MCS 0-7) |
| Modulation | DBPSK, DQPSK, CCK, BPSK, QPSK, 16-QAM, 64-QAM |
| 802.11n Features | A-MPDU / A-MSDU, PSMP, MTBA, STBC, Greenfield Preamble, RIFS |
| Transmit Power (± 2 dBm) | 802.11b: 17 dBm typical |
| | 802.11g/n: 15 dBm typical |
| | 802.11a: 12 dBm typical |
| Security | WEP, WPA-PSK/WPA2-Personal, WPA/WPA2 Enterprise, 802.11i |
| QoS | WMM, WMM-PS, 802.11e |
| Roaming Enhancements | 802.11k/r |
| Extended Range (802.11n) | • |
| Radio Certifications (Pending) | USA, Canada, EU, Japan |
| Power Requirements | |
| Maximum | TBD |
| Normal Operation | TBD |
| Sleep Mode | TBD |

Specifications

ConnectCore™ Wi-MX51

| Mechanical | |
|-------------------------------------|--|
| Dimensions (L x W x H) | 3.228 in x 1.968 in x 0.266 in (82.0 mm x 50.0 mm x 6.75 mm) |
| Module Connectors | 2 x 180-pin board-to-board connectors (Mating connector FCI P/N 61083-184409LF or similar) |
| Module Population Options* | |
| Processor Speed Grade | • |
| Memory (Flash/RAM) | • |
| Network Interfaces | Ethernet: Single 10/100 (standard population), Dual 10/100, Single 10/100/1000 Wireless LAN |
| Accelerometer | ±2g/±4g/±8g Three Axis Low-g (Freescale MMA7455L) |
| Environmental | |
| Operating Temperature | -40° C to +85° C / -40° F to +185° F (Depending on processor speed grade) |
| Storage Temperature | -50° C to +125° C (-58° F to +257° F) |
| Relative Humidity | 5% to 90% (non-condensing) |
| Altitude | 12,000 feet (3,658 meters) |
| Regulatory Approvals (Pending) | |
| FCC Part 15 Class B | • |
| FCC Part 15 Sub C Section 15.247 | • |
| IC RSS-210 Issue 5 Section 6.2.2(o) | • |
| EN55022:2006 Class B | • |
| ICES-003, Class B | • |
| VCCI, Class B | • |
| EN55024:1998 +A1:2001, A2:2003 | • |
| EN61000-3-2:2006 | • |
| EN61000-3-3:1995 +A1:2001, A2:2005 | • |
| EN60950-1:2001 (UL60950-equivalent) | • |
| CSA C22.2, No. 60950 | • |

* Contact your local distributor or Digi sales office for details.

• Module Feature



Visit www.digiembedded.com for part numbers.

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