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Understanding <u>Embedded - Microcontroller, Microprocessor, FPGA Modules</u>

Embedded - Microcontroller, Microprocessor, and FPGA Modules are fundamental components in modern electronic systems, offering a wide range of functionalities and capabilities. Microcontrollers are compact integrated circuits designed to execute specific control tasks within an embedded system. They typically include a processor, memory, and input/output peripherals on a single chip. Microprocessors, on the other hand, are more powerful processing units used in complex computing tasks, often requiring external memory and peripherals. FPGAs (Field Programmable Gate Arrays) are highly flexible devices that can be configured by the user to perform specific logic functions, making them invaluable in applications requiring customization and adaptability.

Applications of **Embedded - Microcontroller**,

Details		
Product Status	Not For New Designs	
Module/Board Type	MPU Core	
Core Processor	Rabbit 4000	
Co-Processor	-	
Speed	58.98MHz	
Flash Size	2MB (Internal), microSD Slot (External)	
RAM Size	1.5MB	
Connector Type	IDC Header 2x25, 2x5, 1xmicroSD Card	
Size / Dimension	1.84" x 2.85" (47mm x 72mm)	
Operating Temperature	-20°C ~ 85°C	
Purchase URL	https://www.e-xfl.com/product-detail/digi-international/20-101-1138	

Email: info@E-XFL.COM

Address: Room A, 16/F, Full Win Commercial Centre, 573 Nathan Road, Mongkok, Hong Kong



COMMUNICATIONS AND CONTROL PROCESSOR



RABBITCORE® RCM4300 SERIES

The RabbitCore RCM4300 series delivers larger mass storage by allowing you to implement up to 2 GB of hot swappable industry-standard microSD™ memory

The RabbitCore RCM4300 series offers larger memory for memory intensive applications. The microSD™ card slot has the ability to store up to 2 GB of data, making this an ideal module for data logging applications. In combination with our FAT file system, users can easily access data via the built-in web server or by simply using the hot-swappable feature. Dynamic C® also adds Megabyte Code Support™ (MCS), which allows the use of 1 MB of on-board SRAM for shared memory and code space.

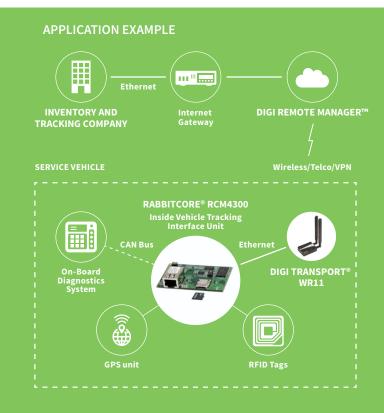
The RCM4300 series is pin-compatible with other RCM4XXX core modules, enabling migration to other designs with specific requirements.

The RabbitCore RCM4300 Development Kit makes evaluation easy with all the hardware and software needed to get started quickly.

BENEFITS

- Rabbit 4000 running at 58.98 MHz
- Supports up to 2 GB microSD memory card, 1 MB SRAM for shared code, 512K of battery-backed SRAM, FAT file organization
- 10/100Base-T Ethernet, 36 GPIO, 6 serial ports
- 8 channel 12-bit resolution (RCM4300 only)
- Embedded web server
- Easily implement secure embedded devices with client side SSL or AES encryption
- Includes Remote Program Update allowing for firmware updates from anywhere in the world

RELATED PRODUCTS RabbitCore® Romanou Series Series Series Romanou Rom



MICROPROCESSOR Rabbit* 4000 at 58.08 MHz EMI REDUCTION Spectrum spreader for reduced EMI (radiated emissions) ETHERNET PORT 10/1008ase1, RJ-45, 3 LEDs 512K (8-bit) 512	SPECIFICATIONS	RCM4300	RCM4310
EMIREDUCTION Spectrum spreader for reduced EMI (radiated emissions) ETHERRE PORT 101/008aws -T, R2-45, 3 LEDs DATA SRAM 512K (8-bit) PROGRAM EXECUTION FAST SRAM 1 MB (8-bit) SERIAL FLASH MEMORY (PROGRAM) 2 MB	FEATURES		
DATA SRAM 512K (8-bit) PROGRAM EXECUTION FAST SRAM 512K (8-bit) \$12K (8-bit) \$1X (8-bit	MICROPROCESSOR	Rabbit® 4000 at 58.98 MHz	
DATA SRAM \$12K (8-bit) PROGRAM) Z MB ALMB (8-bit) Z MB ALMC (PORGRAM) MEMORY (DATA STORAGE) MICROSD** Card 128 MB-2 GB MEMORY (DATA STORAGE) MEMORY (D	EMI REDUCTION	Spectrum spreader for reduced EMI (radiated emissions)	
SERIAL PORTS SERIAL PORTS SERIAL RATE Maximum asynchronous baud rate = CLK/8 SERIAL RATE Maximum asynchronous baud rate = CLK/8 SERIAL RATE SLAVE INTERFACE ADDITONAL OLD TO SLAVE A SLAVE A SLAVE A SLAVE A SLAVE INTERFACE SLAVE INTERFACE SLAVE INTERFACE SLAVE INTERFACE ADDITORS ON SLAVE, SCALOR SLAVE A SLAVE A SLAVE A SLAVE INTERFACE SLAVE INTERFACE APPORE I/O ADDITORS ON SLAVE A SLAVE A SLAVE A SLAVE A SLAVE A SLAVE INTERFACE ADDITORS ON SLAVE A SLAVE A SLAVE A SLAVE A SLAVE A SLAVE INTERFACE ADDITORS ON SLAVE A SLAVE AND SLAVE AND SLAVE A SLAVE AND SLAV	ETHERNET PORT	10/100Base-T, RJ-45, 3 LEDs	
SERIAL FLASH MEMORY (PROGRAM) microSD** Card 128 MB-2 GB LINK/ACT (link/activity) FDX/CDL (full-duplex/collisions) SPEED (on for 100Base-T Ethernet connection) SD (microSD** mounted status) BACKUP BATTERY Connection for user-supplied backup battery (to support RTC and data SRAM) 35 parallel digital I/O lines: Configurable with 4 layers of alternate functions Configurable with 4 layers of alternate functions ADDITIONAL INPUTS 2 startup mode, reset in, CONVERT 2 startup mode, reset in 8 channels single-ended or 4 channels differential Programmable gain 1, 2, 4, 5, 8, 10, 16, and 20 V/V 12 bits (11 bits single-ended) 130 ys AUXILIARY I/O BUS Can be configured for 8 data lines and 5 address lines (shared with parallel I/O lines), plus I/O read/write 5 shared high-speed, CMOS-compatible ports: A SI configurable as synchronous fowith inDA), 4 as clocked serial port shared with programming port 1 clocked serial port shared with port shared with port shared with port	DATA SRAM	512K (8-bit)	
PROGRAM ZMB	PROGRAM EXECUTION FAST SRAM	1 MB (8-bit)	512K (8-bit)
LINK/ACT (link/activity) FDX/CDL (full-duplex/collisions) SPEED (on for 100Base-T Ethernet connection) SD (microSD™ mounted status) BACKUP BATTERY Connection for user-supplied backup battery (to support RTC and data SRAM) Za parallel digital I/O lines: Configurable with 4 layers of alternate functions Configurable with 4 layers of alternate functions Configurable with 4 layers of alternate functions ADDITIONAL INPUTS Za startup mode, reset in, CONVERT Zatartup mode, reset in, CONVERT Z	SERIAL FLASH MEMORY (PROGRAM)	2 MB	1 MB
GENERAL-PURPOSE I/O 28 parallel digital I/O lines: Configurable with a layers of alternate functions Configurable with a layers of a darkers lines (shared with parallel I/O lines), plus I/O read/write Stance Injury I/O BUS Can be configured for 8 data lines and 5 address lines (shared with parallel I/O lines), plus I/O read/write Saparallel digital I/O lines: Configurable with a layers of alternate functions Configurable with a layers of alternate functions N/A N/A 1 disconfigurable with a supprict or a supprict	MEMORY (DATA STORAGE)	microSD™ Card 128 MB–2 GB	microSD™ Card 128 MB–2 GB
ADDITIONAL INPUTS ADDITIONAL INPUTS ADDITIONAL OUTPUTS ADDITIONAL OUTPUTS Status, reset out, analog VREF ANALOG INPUTS: 2 startup mode, reset in, CONVERT 3 channels single-ended or 4 channels differential Programmable gain 1, 2, 4, 5, 8, 10, 16, and 20 VV 12 bits (1 bits single-ended) 180 µs AUXILIARY I/O BUS Can be configured for 8 data lines and 5 address lines (shared with parallel I/O lines), plus I/O read/write 5 shared high-speed, CMOS-compatible ports: - All S configurable as a synchronous (with IrOA), - 4 as clocked serial port shared with programming port - 1 clocked serial port shared	LED INDICATORS	LINK/ACT (link/activity) FDX/COL (full-duplex/collisions) SPEED (on fo	r 100Base-T Ethernet connection) SD (microSD™ mounted status)
ADDITIONAL INPUTS ADDITIONAL INPUTS ADDITIONAL OUTPUTS Statup mode, reset in, CONVERT 2 startup mode, reset in, CONVERT 3 statup, reset out, analog VREF Status, reset out 8 channels single-ended or 4 channels differential Programmable gain 1, 2, 4, 5, 8, 10, 16, and 20 V/V 12 bits (11 bits single-ended) 180 µs AUXILIARY I/O BUS Can be configurable with a layers of alternate functions AUXILIARY I/O BUS Can be configured for 8 data lines and 5 address lines (shared with parallel I/O lines), plus I/O read/write 5 shared high-speed, CMOS-compatible ports: All 5 configurable as asynchronous (with irDA), A as accided serial GPSI), and 1 as SDIC/PIDLC A colceded serial port shared with programming port Clocked serial port shared with A/D converter, serial flash, and microSD™ card SERIAL RATE Maximum asynchronous baud rate = CLK/8 SLAVE INTERFACE Slave port allows the RCM4300 to be used as an intelligent peripheral device slaved to a master processor REAL-TIME CLOCK Yes TIMERS Ten 8-bit timers (6 cascadable from the first), one 10-bit timer with 2 match registers, and one 16-bit timer with 4 outputs and 8 set/reset registers WATCHDOG/SUPERVISOR 4 PWM registers with 10-bit free-running counter and priority interrupts INPUT CAPTURE 2 input capture channels can be used to time input signals from various port pins QUADRATURE DECODER 2-channel quadrature decoder accepts inputs from external incremental encoder modules POWER (PINS UNLOADED) 3.0-3.6 VDC, 350 mA (typ.) @ 3.3V, 385 mA @ 3.6V and 85° C (max.) OPERATING TEMPERATURE CONNECTORS One 2 × 25, 1.27 mm pitch IDC signal header; One microSD™ Card socket; One 2 × 5, 1.27 mm pitch IDC programming header	BACKUP BATTERY	Connection for user-supplied backup battery (to support RTC and data SRAM)	
ADDITIONAL OUTPUTS 8 channels single-ended or 4 channels differential Programmable gain 1, 2, 4, 5, 8, 10, 16, and 20 V/V 12 bits (11 bits single-ended) 180 μs AUXILIARY I/O BUS Can be configured for 8 data lines and 5 address lines (shared with parallel I/O lines), plus I/O read/write 5 shared high-speed, CMOS-compatible ports: - All IS configurable as asynchronous (with irDA), - 4 as clocked serial port shared with programming port - 1 clocked serial port shared with Programming port - 1 clocked serial port shared with Programming port - 1 clocked serial port shared with Programming port - 1 clocked serial port shared with Programming port - 1 clocked serial port shared with Programming port - 1 clocked serial port shared with Programming port - 1 clocked serial port shared with Programming port - 1 clocked serial port shared with programming port - 1 clocked serial port shared with programming port - 1 clocked serial port shared with programming port - 1 clocked serial port shared with serial flash, and microSD™ card SERIAL RATE - Maximum asynchronous baud rate = CLK/8 SLAVE INTERFACE - Slave port allows the RCM4300 to be used as an intelligent peripheral device slaved to a master processor REAL-TIME CLOCK - Yes - TIMERS - Ten 8-bit timers (6 cascadable from the first), one 10-bit timer with 2 match registers, and one 16-bit timer with 4 outputs and 8 set/reset registers WATCHDOG/SUPERVISOR - Yes - Yes - WIM registers with 10-bit free-running counter and priority interrupts INPUT CAPTURE - 2 input capture channels can be used to time input signals from various port pins QUADRATURE DECODER - 2-channel quadrature decoder accepts inputs from external incremental encoder modules POWER (PINS UNLOADED) - 3.0-8 VDC, 350 mA (typ.) @ 3.3V, 385 mA @ 3.6V and 85° C (max.) OPERATING TEMPERATURE - 20° C to +85° C - HUMIDITY - 596 to 95%, non-condensing - CONNECTORS - Con 2 × 5, 1.27 mm pitch IDC signal header; One microSD™ Card socket; One 2 × 5, 1.27 mm pitch IDC programming header	GENERAL-PURPOSE I/O		
ANALOG INPUTS: 8 channels single-ended or 4 channels differential Programmable gain 1, 2, 4, 5, 8, 10, 16, and 20 V/V 12 bits (11 bits single-ended) 180 µs AUXILIARY I/O BUS Can be configured for 8 data lines and 5 address lines (shared with parallel I/O lines), plus I/O read/write 5 shared high-speed, CMOS-compatible ports: • All 5 configurable as asynchronous (with IrDA), • 4 as clocked serial (SPI), and 1 as SDIC./HDLC • 1 clocked serial port shared with programming port • 1 clocked serial port shared with programming port • 1 clocked serial port shared with A/D converter, serial filash, and microSD™ card SERIAL RATE Maximum asynchronous baud rate = CLK/8 SLAVE INTERFACE Slave port allows the RCM4300 to be used as an intelligent peripheral device slaved to a master processor REAL-TIME CLOCK Yes TIMERS MATCHDOG/SUPERVISOR Yes PULSE-WIDTH MODULATORS 4 PWM registers with 10-bit free-running counter and priority interrupts INPUT CAPTURE 2 input capture channels can be used to time input signals from various port pins QUADRATURE DECODER 2-channel quadrature decoder accepts inputs from external incremental encoder modules POWER (PINS UNLOADED) 3.0-3.6 VDC, 350 mA (typ.) @ 3.3V, 385 mA @ 3.6V and 85° C (max.) OPERATING TEMPERATURE 4. 20° C to +85° C HUMIDITY 5% to 95%, non-condensing One 2 × 25, 1.27 mm pitch IDC programming header	ADDITIONAL INPUTS	2 startup mode, reset in, CONVERT	2 startup mode, reset in
ANALOG INPUTS: gain 1, 2, 4, 5, 8, 10, 16, and 20 V/V 12 bits (11 bits single-ended) 180 µs AUXILIARY I/O BUS Shared high-speed, CMOS-compatible ports: All 5 configured for 8 data lines and 5 address lines (shared with parallel I/O lines), plus I/O read/write Shared high-speed, CMOS-compatible ports: All 5 configurable as asynchronous (with IrDA), 4 as clocked serial (SPI), and 1 as SDLC/HDLC 1 clocked serial port shared with Programming port 1 clocked serial port shared with Programming port 1 clocked serial port shared with No converter, serial flash, and microSD™ card 1 clocked serial port shared with A/D converter, serial flash, and microSD™ card 1 clocked serial port shared with name and microSD™ card 1 clocked serial port shared with serial flash and microSD™ card 1 clocked serial port shared with serial flash and microSD™ card 1 clocked serial port shared with serial flash and microSD™ card	ADDITIONAL OUTPUTS	Status, reset out, analog VREF	Status, reset out
AUXILIARY I/O BUS Can be configured for 8 data lines and 5 address lines (shared with parallel I/O lines), plus I/O read/write 5 shared high-speed, CMOS-compatible ports:	ANALOG INDUTS		N/A
AUXILIARY I/O BUS Can be configured for 8 data lines and 5 address lines (shared with parallel I/O lines), plus I/O read/write 5 shared high-speed, CMOS-compatible ports: All 5 configurable as asynchronous (with IrDA), 4 as clocked serial (SPI), and 1 as SDLC/HDLC 1 clocked serial aport shared with programming port 1 clocked serial port shared with Programming port 1 clocked serial port shared with A/D converter, serial flash, and microSD™ card Maximum asynchronous baud rate = CLK/8 SLAVE INTERFACE Slave port allows the RCM4300 to be used as an intelligent peripheral device slaved to a master processor REAL-TIME CLOCK Yes TIMERS Ten 8-bit timers (6 cascadable from the first), one 10-bit timer with 2 match registers, and one 16-bit timer with 4 outputs and 8 set/reset registers WATCHDOG/SUPERVISOR Yes PULSE-WIDTH MODULATORS 4 PWM registers with 10-bit free-running counter and priority interrupts INPUT CAPTURE 2 input capture channels can be used to time input signals from various port pins QUADRATURE DECODER 2-channel quadrature decoder accepts inputs from external incremental encoder modules POWER (PINS UNLOADED) 3.0-3.6 VDC, 350 mA (typ.) @ 3.3V, 385 mA @ 3.6V and 85° C (max.) OPERATING TEMPERATURE One 2 × 25, 1.27 mm pitch IDC signal header; One microSD™ Card socket; One 2 × 5, 1.27 mm pitch IDC programming header	ANALOG INPUTS:	12 bits (11 bits single-ended)	N/A
SERIAL PORTS 5 shared high-speed, CMOS-compatible ports: • All 5 configurable as asynchronous (with IrDA), • 4 as clocked serial [SPI), and 1 as SDLC/HDLC • 1 clocked serial port shared with programming port • 1 clocked serial port shared with programming port • 1 clocked serial port shared with A/D converter, serial flash, and microSD™ card Maximum asynchronous baud rate = CLK/8 SLAVE INTERFACE Slave port allows the RCM4300 to be used as an intelligent peripheral device slaved to a master processor REAL-TIME CLOCK Ten 8-bit timers (6 cascadable from the first), one 10-bit timer with 2 match registers, and one 16-bit timer with 4 outputs and 8 set/reset registers WATCHDOG/SUPERVISOR Ves PULSE-WIDTH MODULATORS 4 PWM registers with 10-bit free-running counter and priority interrupts INPUT CAPTURE 2 input capture channels can be used to time input signals from various port pins QUADRATURE DECODER 2-channel quadrature decoder accepts inputs from external incremental encoder modules POWER (PINS UNLOADED) 3.0-3.6 VDC, 350 mA (typ.) @ 3.3V, 385 mA @ 3.6V and 85° C (max.) OPERATING TEMPERATURE 2 one 2 × 25, 1.27 mm pitch IDC signal header; One microSD™ Card socket; One 2 × 5, 1.27 mm pitch IDC programming header			
PAIL 5 configurable as a synchronous (with IrDA), 4 as clocked serial (SPI), and 1 as SDLC/HDLC 1 clocked serial port shared with programming port 1 clocked serial port shared with A/D converter, serial flash, and microSD™ card Maximum asynchronous baud rate = CLK/8 SLAVE INTERFACE Slave port allows the RCM4300 to be used as an intelligent peripheral device slaved to a master processor REAL-TIME CLOCK Yes Ten 8-bit timers (6 cascadable from the first), one 10-bit timer with 2 match registers, and one 16-bit timer with 4 outputs and 8 set/reset registers WATCHDOG/SUPERVISOR Yes PULSE-WIDTH MODULATORS 4 PWM registers with 10-bit free-running counter and priority interrupts INPUT CAPTURE 2 input capture channels can be used to time input signals from various port pins QUADRATURE DECODER 2-channel quadrature decoder accepts inputs from external incremental encoder modules POWER (PINS UNLOADED) 3.0-3.6 VDC, 350 mA (typ.) @ 3.3V, 385 mA @ 3.6V and 85° C (max.) OPERATING TEMPERATURE One 2 × 25, 1.27 mm pitch IDC signal header; One microSD™ Card socket; One 2 × 5, 1.27 mm pitch IDC programming header	AUXILIARY I/O BUS	Can be configured for 8 data lines and 5 address lines (shared with parallel I/O lines), plus I/O read/write	
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TIMERS Ten 8-bit timers (6 cascadable from the first), one 10-bit timer with 2 match registers, and one 16-bit timer with 4 outputs and 8 set/reset registers WATCHDOG/SUPERVISOR Yes PULSE-WIDTH MODULATORS 4 PWM registers with 10-bit free-running counter and priority interrupts INPUT CAPTURE 2 input capture channels can be used to time input signals from various port pins QUADRATURE DECODER 2-channel quadrature decoder accepts inputs from external incremental encoder modules POWER (PINS UNLOADED) 3.0-3.6 VDC, 350 mA (typ.) @ 3.3V, 385 mA @ 3.6V and 85° C (max.) OPERATING TEMPERATURE -20° C to +85° C HUMIDITY 5% to 95%, non-condensing CONNECTORS One 2 × 25, 1.27 mm pitch IDC signal header; One microSD™ Card socket; One 2 × 5, 1.27 mm pitch IDC programming header	SERIAL RATE	Maximum asynchronous baud rate = CLK/8	
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PULSE-WIDTH MODULATORS 4 PWM registers with 10-bit free-running counter and priority interrupts 2 input capture channels can be used to time input signals from various port pins QUADRATURE DECODER 2-channel quadrature decoder accepts inputs from external incremental encoder modules POWER (PINS UNLOADED) 3.0-3.6 VDC, 350 mA (typ.) @ 3.3V, 385 mA @ 3.6V and 85° C (max.) OPERATING TEMPERATURE -20° C to +85° C HUMIDITY 5% to 95%, non-condensing CONNECTORS One 2 × 25, 1.27 mm pitch IDC signal header; One microSD™ Card socket; One 2 × 5, 1.27 mm pitch IDC programming header	TIMERS	· · · · · · · · · · · · · · · · · · ·	
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QUADRATURE DECODER 2-channel quadrature decoder accepts inputs from external incremental encoder modules 3.0-3.6 VDC, 350 mA (typ.) @ 3.3V, 385 mA @ 3.6V and 85° C (max.) OPERATING TEMPERATURE -20° C to +85° C HUMIDITY 5% to 95%, non-condensing CONNECTORS One 2 × 25, 1.27 mm pitch IDC signal header; One microSD™ Card socket; One 2 × 5, 1.27 mm pitch IDC programming header	PULSE-WIDTH MODULATORS	4 PWM registers with 10-bit free-running counter and priority interrupts	
POWER (PINS UNLOADED) 3.0–3.6 VDC, 350 mA (typ.) @ 3.3V, 385 mA @ 3.6V and 85° C (max.) OPERATING TEMPERATURE -20° C to +85° C HUMIDITY 5% to 95%, non-condensing CONNECTORS One 2 × 25, 1.27 mm pitch IDC signal header; One microSD™ Card socket; One 2 × 5, 1.27 mm pitch IDC programming header	INPUT CAPTURE	2 input capture channels can be used to time input signals from various port pins	
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CONNECTORS One 2 × 25, 1.27 mm pitch IDC signal header; One microSD™ Card socket; One 2 × 5, 1.27 mm pitch IDC programming header	OPERATING TEMPERATURE	-20° C to +85° C	
	HUMIDITY	5% to 95%, non-condensing	
	CONNECTORS	One 2 × 25, 1.27 mm pitch IDC signal header; One microSD™ Card socket; One 2 × 5, 1.27 mm pitch IDC programming header	
BOARD SIZE 1.84" × 2.85" × 0.84" (47 mm × 72 mm × 21 mm)	BOARD SIZE	1.84" × 2.85" × 0.84" (47 mm × 72 mm × 21 mm)	

PART NUMBERS	DESCRIPTION
20-101-1138	RCM4300
20-101-1139	RCM4310

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