## Digi - 16051220 Datasheet





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#### **Understanding Embedded - Microprocessors**

Embedded microprocessors are specialized computing chips designed to perform specific tasks within an embedded system. Unlike general-purpose microprocessors found in personal computers, embedded microprocessors are tailored for dedicated functions within larger systems, offering optimized performance, efficiency, and reliability. These microprocessors are integral to the operation of countless electronic devices, providing the computational power necessary for controlling processes, handling data, and managing communications.

## Applications of **Embedded - Microprocessors**

Embedded microprocessors are utilized across a broad spectrum of applications, making them indispensable in

Details	
Product Status	Not For New Designs
Core Processor	Rabbit 6000
Number of Cores/Bus Width	1 Core, 8-Bit
Speed	200MHz
Co-Processors/DSP	·
RAM Controllers	
Graphics Acceleration	No
Display & Interface Controllers	-
Ethernet	10/100Mbps (1)
SATA	
USB	USB 2.0 (1)
Voltage - I/O	1.2V, 3.3V
Operating Temperature	-40°C ~ 85°C (TA)
Security Features	-
Package / Case	292-LFBGA
Supplier Device Package	292-BGA (17x17)
Purchase URL	https://www.e-xfl.com/product-detail/digi-international/16051220

Email: info@E-XFL.COM

Detaile

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

# Rabbit<sup>®</sup> 6000

**Communications and Control Processor** 

A System-on-Chip ideal for industrial designs requiring multiple connectivity options. On-board features include Wi-Fi, USB and Ethernet.

## Overview

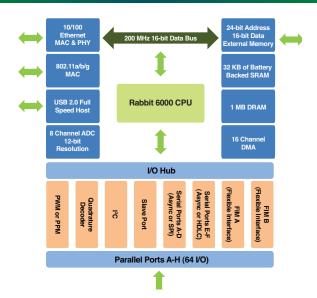
The Rabbit 6000 raises the industry standard as the first wireless processor providing a rich set of industrial embedded control features. It is the perfect complement to future hardware designs, such as our award winning single-board computer (SBC) products that provide low-cost PLC functionality. Running at 200 MHz, the Rabbit 6000 is optimized for embedded control systems requiring high performance without sacrificing costs.

The integrated hardware and software environment with processor specific libraries allows for programmable features such as I/O and peripherals to dramatically reduce development costs and time to market. The Rabbit 6000 eliminates the dependency on external components, thus increasing product longevity.





## Block Diagram



## **Features/Benefits**

- Clock speed up to 200 MHz
- On-board 802.11 a/b/g and 10/100 Ethernet
- 64 I/O and up to 6 serial ports (4 as SPI)
- 1 MB internal DRAM and 32K battery backable SRAM
- USB 2.0 full speed host
- 12-bit A/D converter samples up to 1Megasamples/s
- Ideal for industrial motor control
- Integrated hardware and software environment
- Easily add an HMI as well as CANbus protocol support with the on-board FIMs
- 4 PWM channels, 4 PPM channels

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Address Bus24-bitData Bus8/16-bitTimersImage: ClockReal-Time ClockImage: ClockReal-Time ClockImage: ClockRect Gording Timer/SupervisorImage: ClockClock ModesImage: ClockPower-Down ModesImage: ClockExternal I/OImage: ClockA/D ConvertersImage: Clock ModesImage: Clock ModeImage: Clock ModesImage: Clock ModeImage: Clock ModesImage: Clock ModeImage: Clock ModesImage: Clock ModeImage: Clock	Specifications	Rabbit® 6000
Package Size17 mm x 17 mm x 1.3 mmOperating Votage1.2V / 0. ingOperating Current372 µA/MHz @ 1.2V / 3.3V (Wi-Fi and Ethernet Disabled)Operating Temperature-40° C to +85° CMaximum Clock Speed200 MHzDigital I/O64+ (arranged in eight 8-bit ports)Network Interfaces10/1008ase-T, 802.11a/b/g Wi-FiSerial Ports6 CMOS-compatibleBaud RateClock speed / 8 max. asynchronousFC1Address Bus24-bitData Bos6 MICReal-Time ClockYesReal-Time ClockYesClock Modes1x, 2x, /2, /3, /4, /6, /8Power-Down ModesSiergi (32 kHz), Utra Sleepy (16, 8, 2 kHz)Add Conserters12-bit, eight multiplexed channels, up to 1 megasample/s (Wi-Fi disabled)Af Converters12-bit, eight multiplexed channels, up to 1 megasample/s (Wi-Fi disabled)	Features	
Constant   Constant     Operating Yoldage   1.2VDC core. 3.3V DC 1/0 ring     Operating Gurrent   372 µA/MHz @ 1.2V / 3.3V (Wi-Fi and Ethernet Disabled)     Operating Temperature   -40° C to +85° C     Maximum Clock Speed   200 MHz     Digital I/O   644 (arranged in eight 8-bit ports)     Network Interfaces   10/100Base-T, 802.11a/b/g Wi-Fi     Serial Ports   6 CMOS-compatible     Baud Rate   Clock speed / 8 max, asynchronous     FC   1     Address Bus   20.4 Hz     Data Bus   8/16-bit     Times   Ten 8-bit, one 10-bit with 2 match registers, and one 16-bit with 8 match registers     Real-Time Clock   Yes, battery-backable     RT Coscillator Gircuitry   Yes     Vatchodgs Timer/Supervisor   Yes     Rto Goldator Gircuitry   Yes     Power-Down Modes   Seriegit Ruttiplexed channels, up to 1 megasamples/s (Wi-Fi disabled)     A/D Converters   12-bit, eight multiplexed channels, up to 1 megasamples/s (Wi-Fi disabled)	Package	292-ball BGA
Operating Temper372 μA/MHz @ 1.2V / 3.3V (Wi-Fi and Ethernet Disabled)Operating Temperature-40° C to +85° CMaximum Clock Speed200 MHzDigital I/064+ (arranged in eight 8-bit ports)Network Interfaces10/100Base-T, 802.11a/b/g Wi-FiSerial Ports6 CMOS-compatibleBaud RateClock speed / 8 max, asynchronousI*C1Address Bus24-bitData Bus8/16-bitTimersTen 8-bit, one 10-bit with 2 match registers, and one 16-bit with 8 match registersReal-Time ClockYes, battery-backableRtC Oscillator CircuitryYesVatchdog Timer/SupervisorYesClock ModesSteepy (32 kHz), Ultra Sleepy (16, 8, 2 kHz)Eternal I/O8 or 16-bit data, 8 address linesA/D Converters12-bit, eight multiplexed channels, up to 1 megasamples/s (Wi-Fi disabled)	Package Size	17 mm x 17 mm x 1.3 mm
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Anxinum Clock Speed   Constrained     Maximum Clock Speed   200 MHz     Digital J/O   64+ (arranged in eight 8-bit ports)     Network Interfaces   10/100Base-T, 802.11a/b/g Wi-Fi     Serial Ports   6 CMOS-compatible     Baud Rate   Clock speed / 8 max. asynchronous     I*C   1     Address Bus   24-bit     Data Bus   8/16-bit     Timers   Ten 8-bit, one 10-bit with 2 match registers, and one 16-bit with 8 match registers     Real-Time Clock   Yes, battery-backable     RTC Oscillator Circuitry   Serial Ports     Vatchdog Timer/Supervisor   Yes     Clock Modes   Sleepy (32 kHz), Ultra Sleepy (16, 8, 2 kHz)     External I/O   8 or 16-bit data, 8 address lines     A/D Converters   10-bit, 2 synchronous channels, up to 40 megasample/s 10-bit, single channel, up to 1 megasample/s (Wi-Fi disabled)	Operating Current	372 μA/MHz @ 1.2V / 3.3V (Wi-Fi and Ethernet Disabled)
Digital I/O 64+ (arranged in eight 8-bit ports)   Network Interfaces 10/1008ase-T, 802.11a/b/g Wi-Fi   Serial Ports 6 CMOS-compatible   Baud Rate Clock speed / 8 max, asynchronous   PC 1   Address Bus 24-bit   Data Bus 8/16-bit   Timers Ten 8-bit, one 10-bit with 2 match registers, and one 16-bit with 8 match registers   Real-Time Clock Yes, battery-backable   RTC Oscillator Circuitry Ves   Vatchdog Timer/Supervisor Yes   Clock Modes 1x, 2x, /2, /3, /4, /6, /8   Power-Down Modes Sleepy (32 kHz), Ultra Sleepy (16, 8, 2 kHz)   External I/O 8 or 16-bit multiplexed channels, up to 1 megasample/s (Wi-Fi disabled)	Operating Temperature	-40° C to +85° C
Network Interfaces10/100Base-T, 802.11a/b/g Wi-FiSerial Ports6 CMOS-compatibleBaud RateClock speed / 8 max. asynchronousI*C1Address Bus24-bitData Bus8/16-bitTimersTen 8-bit, one 10-bit with 2 match registers, and one 16-bit with 8 match registersReal-Time ClockYes, battery-backableRTC Oscillator CircuitryYes, battery-backableWatchdog Timer/SupervisorYesClock Modes11, 2x, /2, /3, /4, /6, /8Power-Down ModesSleepy (32 kHz), Ultra Sleepy (16, 8, 2 kHz)External I/O8 or 16-bit data, 8 address linesA/D Converters10-bit, 2 synchronous channels, up to 40 megasamples/s 10-bit, single channel, up to 1 megasample/s (Wi-Fi disabled)	Maximum Clock Speed	200 MHz
Serial Ports 6 CMOS-compatible   Baud Rate Clock speed / 8 max. asynchronous   I*C 1   Address Bus 24-bit   Data Bus 8/16-bit   Timers Ten 8-bit, one 10-bit with 2 match registers, and one 16-bit with 8 match registers   Real-Time Clock Yes, battery-backable   Rt Oscillator Circuitry Yes   Clock Modes 1x, 2x, /2, /3, /4, /6, /8   Power-Down Modes Sleepy (32 kH2), Ultra Sleepy (16, 8, 2 kH2)   External I/O 8 or 16-bit data, 8 address lines   A/D Converters 10-bit, 2 synchronous channels, up to 40 megasamples/s 10-bit, single channel, up to 1 megasample/s (Wi-Fi disabled)	Digital I/O	64+ (arranged in eight 8-bit ports)
Baud Rate Clock speed / 8 max. asynchronous   FC 1   Address Bus 24-bit   Data Bus 8/16-bit   Timers State Context of the state of the	Network Interfaces	10/100Base-T, 802.11a/b/g Wi-Fi
I*C 1   Address Bus 24-bit   Data Bus 8/16-bit   Timers Ten 8-bit, one 10-bit with 2 match registers, and one 16-bit with 8 match registers   Real-Time Clock Yes, battery-backable   RTC Oscillator Circuitry External   Watchdog Timer/Supervisor Yes   Clock Modes 1x, 2x, /2, /3, /4, /6, /8   Power-Down Modes Sleepy (32 kHz), Ultra Sleepy (16, 8, 2 kHz)   External I/O 8 or 16-bit data, 8 address lines   A/D Converters 10-bit, 2 synchronous channels, up to 0 megasamples/s 10-bit, single channel, up to 1 megasamples/s (Wi-Fi disabled)	Serial Ports	6 CMOS-compatible
Address Bus24-bitData Bus8/16-bitTimersImage: ClockReal-Time ClockImage: ClockReal-Time ClockImage: ClockRect Gording Timer/SupervisorImage: ClockClock ModesImage: ClockPower-Down ModesImage: ClockExternal I/OImage: ClockA/D ConvertersImage: Clock ModesImage: Clock ModeImage: Clock ModesImage: Clock ModeImage: Clock ModesImage: Clock ModeImage: Clock ModesImage: Clock ModeImage: Clock	Baud Rate	Clock speed / 8 max. asynchronous
Data Bus 8/16-bit   Timers S/16-bit with 2 match registers, and one 16-bit with 8 match registers   Real-Time Clock Yes, battery-backable   RtC Oscillator Circuitry Converters   Power-Down Modes Yes   External I/O Se or 16-bit data, 8 address lines   A/D Converters 12-bit, 2 synchronous channels, up to 40 megasamples/s 10-bit, single channel, up to 1 megasamples/s (Wi-Fi disabled)	I²C	1
Timers Ten 8-bit, one 10-bit with 2 match registers, and one 16-bit with 8 match registers   Real-Time Clock Yes, battery-backable   RTC 0scillator Circuitry Converters   Watchdog Timer/Supervisor Yes   Clock Modes Yes   Power-Down Modes Sleepy (32 kHz), Ultra Sleepy (16, 8, 2 kHz)   External I/O 8 or 16-bit data, 8 address lines   A/D Converters 10-bit, 2 synchronous channels, up to 40 megasamples/s 10-bit, single channel, up to 1 megasample/s (Wi-Fi disabled)	Address Bus	24-bit
Real-Time Clock Yes, battery-backable   RTC Oscillator Circuitry External   Watchdog Timer/Supervisor Yes   Clock Modes Yes   Power-Down Modes Sleepy (32 kHz), Ultra Sleepy (16, 8, 2 kHz)   External I/O 8 or 16-bit data, 8 address lines   A/D Converters 10-bit, 2 synchronous channels, up to 40 megasamples/s 10-bit, single channel, up to 1 megasample/s (Wi-Fi disabled)	Data Bus	8/16-bit
RTC Oscillator Circuitry External   Watchdog Timer/Supervisor Yes   Clock Modes 1x, 2x, /2, /3, /4, /6, /8   Power-Down Modes Sleepy (32 kHz), Ultra Sleepy (16, 8, 2 kHz)   External I/O 8 or 16-bit data, 8 address lines   A/D Converters 10-bit, 2 synchronous channels, up to 40 megasamples/s 10-bit, single channel, up to 1 megasamples/s (Wi-Fi disabled)	Timers	Ten 8-bit, one 10-bit with 2 match registers, and one 16-bit with 8 match registers
Watchdog Timer/Supervisor Yes   Clock Modes Yes   Power-Down Modes Sleepy (32 kHz), /U, /6, /8   External I/O So or 16-bit data, 8 address lines   A/D Converters 10-bit, 2 synchronous channels, up to 40 megasamples/s 10-bit, single channel, up to 1 megasample/s (Wi-Fi disabled)	Real-Time Clock	Yes, battery-backable
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External I/O 8 or 16-bit data, 8 address lines   A/D Converters 12-bit, eight multiplexed channels, up to 1 megasamples/s 10-bit, 2 synchronous channels, up to 40 megasamples/s 10-bit, single channel, up to 1 megasample/s (Wi-Fi disabled)	Clock Modes	1x, 2x, /2, /3, /4, /6, /8
A/D Converters 12-bit, eight multiplexed channels, up to 1 megasamples/s 10-bit, 2 synchronous channels, up to 40 megasamples/s 10-bit, single channel, up to 1 megasample/s (Wi-Fi disabled)	Power-Down Modes	Sleepy (32 kHz), Ultra Sleepy (16, 8, 2 kHz)
A/D Converters 10-bit, 2 synchronous channels, up to 40 megasamples/s 10-bit, single channel, up to 1 megasample/s (Wi-Fi disabled)	External I/O	8 or 16-bit data, 8 address lines
	A/D Converters	
D/A Converters 10-bit, 2 synchronous channels, up to 80 megasamples/s (Wi-Fi Disabled)	D/A Converters	10-bit, 2 synchronous channels, up to 80 megasamples/s (Wi-Fi Disabled)

## Software

The Dynamic C® integrated development environment reduces the time and effort to write real-time software for embedded systems that use a Rabbit microprocessor, enabling easy development of a wide range of applications.

Rabbit integrates editing, compiling, linking, loading and debugging into a single development environment as one function. There are no compatibility issues when moving from one stage to another. Once the design is complete, you can debug it on the target hardware and see how your code works. Because it is a dialect of C, the Dynamic C language has all the statements and constructions of traditional C, plus extensions that make it easier to write reliable, real-time multi-tasking software. The Dynamic C integrated development environment allows for easy hardware migration, moving from a single-board computer to chip level production.

Dynamic C also includes highly useful software components that can add functionality and value to your applications. This functionality includes web server capability, filing system, remote firmware updates, and wired and wireless security. Compatible software components are listed below.



## **Rabbit Program Update**

Allows for remote firmware updates from anywhere in the world using an Internet connection

Wi-Fi Authentication Provides strongest Wi-Fi security

available via WPA-2 and 802.11i



#### RabbitWeb

Easily create web interfaces to monitor and control embedded applications

You can purchase with confidence knowing that Digi is always available to serve you with expert technical support and our industry leading warranty. For detailed information visit www.digi.com/support

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