Ethernut 2.1 128

Embedded Ethernet

8 inputs
to monitor
analog values

Digital I/O port, 5 V logic,
additionally offers
counter I/O, USART, SPI, I2C
or PWM to connect almost
any peripheral

512 kByte RAM
supports large
data buffers

Power supply from
and to the board

Memory
expansion bus

RS-232 connector
to control
and monitor
external devices

RS-485 bus
for industrial
applications

512 kByte
non-volatile
serial data
memory

Memory mapped
industrial grade
Ethernet controller

9-12 V
power supply
connector

JTAG
programming
and
debugging

Low power, high performance
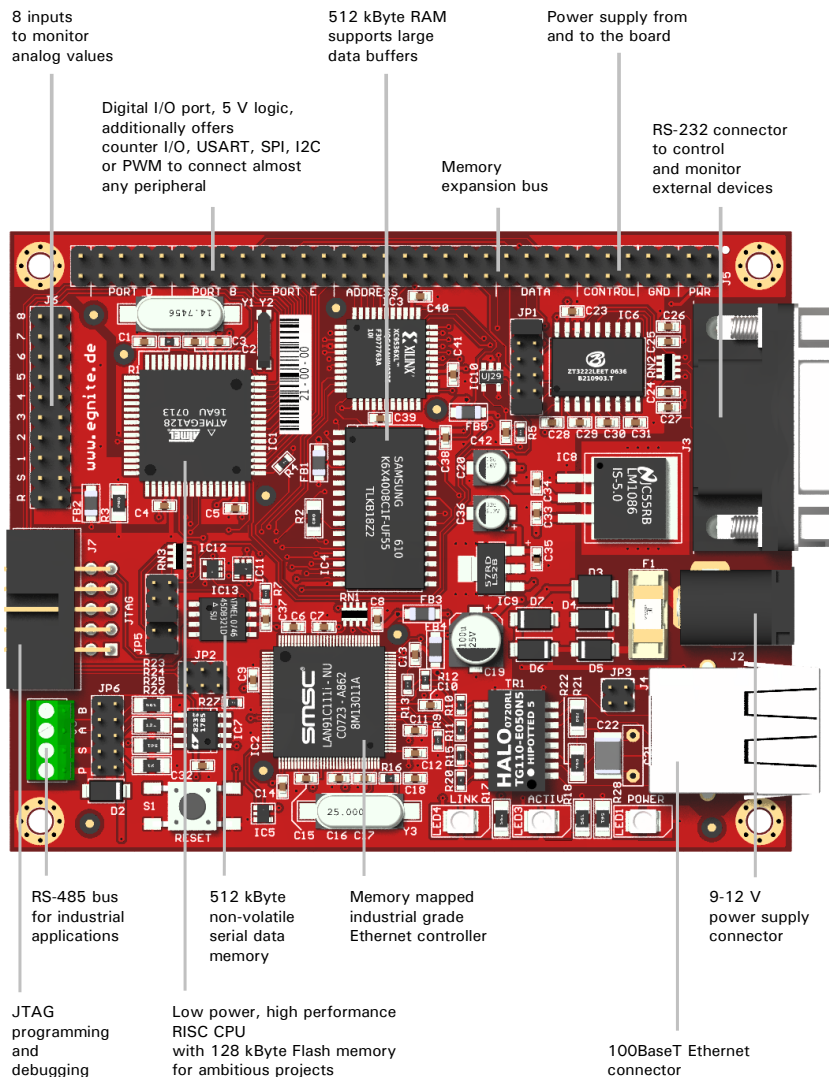RISC CPU
with 128 kByte Flash memory
for ambitious projects

100BaseT Ethernet
connector

Hardware

Since their introduction in 1997, Atmel's AVR microcontrollers guarantee fast code execution combined with the lowest possible power consumption. Ethernut 2.1 is a single board computer with an extended temperature range, which integrates the 8-bit AVR ATmega128 into an Ethernet network.

In addition to 100 Mbit Ethernet, the board offers a larger memory than its predecessor, Ethernut 1. With the extra RS-485 interface and the extended temperature range from -40 to 85 °C, Ethernut 2.1 is predestined for industrial applications.

Like all other Ethernut boards, it provides an extension connector for attaching additional hardware. Hence it is suitable for both the prototyping of your own hardware as well as for direct integration into your finished product.

This robust board has been in production since 2003. Our in-house quality control procedures guarantee a consistently high level of reliability.

Software

Application development is carried out in the high level programming language C, using either free GNU tools or the commercially supported ImageCraft compiler.

An active Open Source community developed and managed Nut/OS, a cooperative multithreading operating system with TCP/IP stack, which was specially designed with tiny embedded systems in mind. The

well documented source code provides a convenient user interface, which is very similar to the C programming of desktop PC's. Programmers will therefore quickly feel at ease operating this.

Although pre-configured for Ethernut 2.1, all important settings can be customized with just a few mouse clicks with an easy to use graphical interface available on Linux,

Windows and Mac OS X PCs incorporating any special requirements. A complete Internet enabled web server needs less than 60 kByte Flash and 12 kByte RAM. This leaves enough space for ambitious product ideas, including a boot loader for the update of firmware via the network. Many useful example applications are included in the distribution.
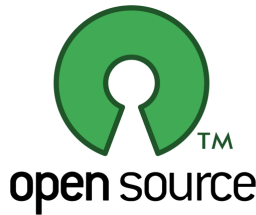
Ethernut 2.1 128

Embedded Ethernet

Support

Several companies with many years of experience in Nut/OS software and Ethernut hardware offer commercial support.

Furthermore, mailing lists are an important element of this Open Source project, which enable developers to share their experiences and to help one another in problem solving.

Licence

The entire source code for the target system, as well as the hardware design, have a permissive BSD licence. This is available for commercial products without any licence fees.

In contrast to some other Open Source licence models, there is no obligation to publish your own source code enhancements.

Technical data

Processor

CPU	ATmega128-16AU, 14.7456 MHz clock
Flash memory	Internal 128 kByte
EEPROM	Internal 4 kByte
Static RAM	External 512 kByte
Serial Flash	External 512 kByte
RTC	Software with 32.768 kHz crystal

Interfaces

Ethernet	RJ-45 10/100BaseT (LAN91C111i)
RS-232	1 x 9-pin DCE, 4-Wire
RS-485	Half duplex
Digital I/O	20 configurable GPIO lines with alternate functions
Analog I/O	10-bit ADC, 8 multiplexed inputs with alternate functions
Programming	10-pin JTAG
Indicators	Power (red), link (yellow), activity (green)

Power supply

Regulator	Linear 1.5 A LDO (LM1086)
Input	2.1 mm barrel connector, unregulated 9 to 12 V DC
Expansion port	9 to 12 V unregulated or 5 V regulated, output > 4 W
Consumption	< 3 W at 9 V
Battery backup	None

Protection

RS-232	15 kV ESD protection
RS-485	15 kV ESD protection
Ethernet	Transformer isolation
Power supply	1 A replaceable fuse, rectifier bridge, current limiter, thermal shutdown

Environmental

Operating temperature	-40 to 85 °C (-40 to 185 °F)
Storage temperature	-65 to 140 °C (-85 to 284 °F)
Humidity	5 to 95 %, non-condensing

Approvals

Immunity	EN 61000-6-1:2001
	EN 61000-6-2:2001
Emission	EN 61000-6-3:2001
	EN 61000-6-4:2001
Safety	PCB flammability rating UL94-V-0
RoHS compliance	EU directive 2002/95/EC

Metrics

Dimensions (L x B x H)	98 x 78 x 17 mm (3.86 x 3.07 x 0,67 in)
Weight	64 g (0.141 lb)

Product identification

PCB revision	Written in copper on the PCB's backside
Serial number	IEEE registered MAC Address on barcode sticker label (Code 128C)

Order information

Ethernut Starter Kit 2.1C 128

Item no.	EGN100703
Included in delivery	Ethernut Bulk 2.1C 128
	1 spare fuse
	1 SP DUO 2 (AVR in-system programmer)
	1 serial cable
	manual, software CD
	2-year warranty

Ethernut Bulk 2.1C 128

Item no.	EGN100603
Included in delivery	Ethernut Bulk 2.1C 128
	2-year warranty