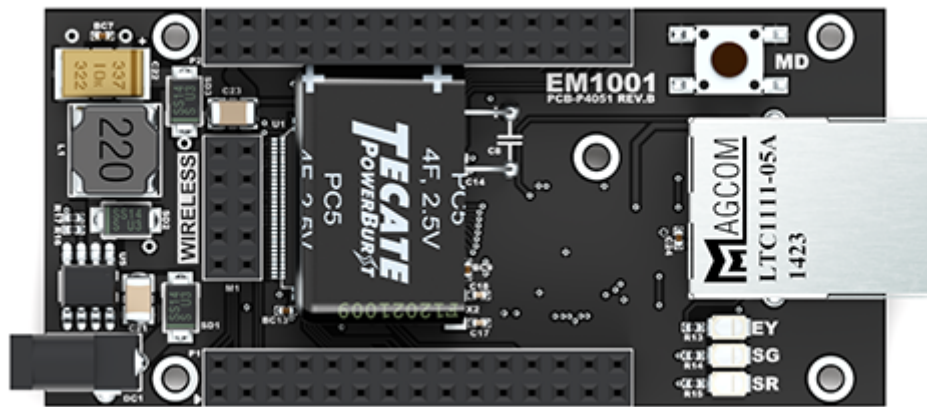


EM1001 BASIC-programmable Ethernet Board



Introduction

The EM1001 is Tibbo's most powerful and versatile BASIC-programmable Ethernet board. The EM1001 is a close relative of the [EM1000 Ethernet module](#). Two devices have the same feature set, including the 10/100BaseT Ethernet port, four serial ports, onboard flash disk, EEPROM, and the RTC with optional backup supercapacitor. Like the EM1000, the EM1001 board can control a [GA1000 Wi-Fi add-on](#), as well as an external LCD, keypad, buzzer, and many other peripheral components.

Unlike the EM1000, the EM1001 is a *self-sufficient board*: it has a 12V-to-3.3V switching power regulator, RJ45 connector with magnetics, [three LEDs](#), and the [MD button](#). Thus, the EM1001 does not require a host board to plug into. The EM1001 *is* the host board. As such, the EM1001 is equally suited to low-volume production devices and hobbyist projects alike.

The EM1001 is fully supported by TIDE software. The board shares the same platform with the EM1000 module (see "TIDE and Tibbo BASIC Manual").

Hardware features

- Based on a high-performance purpose-built 88-MHz T1000 ASIC.
- 10/100BaseT auto-MDIX Ethernet port with RJ45/magnetics (MDIX feature means automatic detection of "straight" and "cross" cables).
- Optional Wi-Fi interface (requires the [GA1000](#) add-on module).
- Four high-speed serial ports (CMOS-level):
 - Baudrates of up to 921,600bps;
 - None/even/odd/mark/space parity modes;
 - 7/8 bits/character modes;

- Full-duplex mode with optional flow control;
- Half-duplex mode with direction control;
- Encoding and decoding of Wiegand and clock/data streams.
- 1024KB flash memory for firmware, application, and data storage.
- 2KB EEPROM for data storage.
- RTC with an optional onboard supercapacitor.
- Up to 54 general-purpose I/O lines. Among them:
 - 8 interrupt lines;
 - Serial port lines;
 - 40 lines that are combined into five 8-bit ports;
 - Square wave output (6Hz - 22'1184MHz), which can be used to control an external buzzer.
 - Supports external LCD and keypad.
 - [Three LEDs onboard](#):
 - Green and red status LEDs;
 - Yellow Ethernet status LED.
 - Control lines for external green and red status LEDs.
 - [MD button onboard](#).
 - RST and MD control lines.
 - Software- and hardware-controlled onboard PLL to select the clock frequency of the device: 11.0592MHz with PLL off, 88.4736MHz with PLL on.
 - Reliable power-on/ brown-out reset circuit.
 - Power options:
 - Through the switching power regulator: 8-20V supplied via the power jack or VIN line;
 - Direct 3.3V power: regulated 3.3V supplied via the 3.3V line.
 - Available current: when powered through the switching regulator, the EM1001 can supply up to 1A of power through its 3.3V pin (1.3A without the GA1000).
 - Dimensions: 75x36x17.5mm (not including protruding RJ45 and power jack; GA1000, when installed, adds 1.5mm to the combined device height).
 - Firmware and Tibbo BASIC application are upgradeable through the serial port or network.

- Tibbo BASIC application can be debugged through the network and no additional debugging hardware (such as a JTAG board) is required.

Programming features

- Variable Types: Byte, char, integer (word), short, dword, long, real, string, plus user-defined arrays and structures.
- Function Groups: string functions (27 in total!), date/time conversion functions (8), encryption/hash calculation functions (AES128, RC4, MD5, SHA-1), and more.
- Platform objects:
 - Sock — socket communications (up to 16 UDP, TCP, and HTTP sessions);
 - Net — controls the Ethernet port;
 - Wln — handles the Wi-Fi interface (requires the [GA1000](#) add-on module);
 - Ssi — implements up to four serial synchronous interface (SSI) channels, supports SPI, I2C, clock/data, etc.;
 - Ser — in charge of serial ports (UART, Wiegand, and clock/data modes);
 - Io — handles I/O lines, ports, and interrupts;
 - Lcd — controls graphical display panels (several types supported, LCD must be connected externally);
 - Kp — scans keypads of matrix and "binary" types (keypad must be connected externally);
 - Rtc — keeps track of date and time;
 - Fd — manages flash memory file system and direct sector access;
 - Stor — provides access to the EEPROM;
 - Romfile — facilitates access to resource files (fixed data);
 - Pppoe — provides access to the Internet over an ADSL modem;
 - Ppp — provides access to the Internet over a serial modem (GPRS, POTS, etc.);
 - Pat — "plays" patterns on up to five LED pairs (2 LEDs onboard, additional LEDs must be connected externally);
 - Beep — generates buzzer patterns (buzzer must be connected externally);
 - Button — monitors the MD line (button);
 - Sys — in charge of general device functionality.

