



Introduction

The EM500 is a miniature stand-alone BASIC-programmable embedded module, designed to be used in combination with a standard LED/magnetics RJ45 jack. The combined footprint of the EM500 and a standard jack is only 28.5x18.5mm.

The module's hardware mix, which includes 10/100BaseT Ethernet port, a serial port, and 8 I/O lines, has been carefully tailored to address the basic needs of lightweight network-enabled control devices. In the near future, the EM500 will also support Wi-Fi communications (using the [GA1000](#) add-on board), as well as external LCD, keypad, and flash disk (via an SPI flash IC).

Compact dimensions, a space-saving "vertical slice" mechanical design, low power consumption, and innovative dual-function LED control lines make the module an excellent fit for miniature, cost-sensitive designs.

The EM500 is fully supported by TIDE software and a dedicated EM500 platform that covers all hardware facilities of the module (see "TIDE and Tibbo BASIC Manual"). For convenient testing and evaluation Tibbo offers the [EM500EV](#) development system.

The EM500 can be ordered standalone or in combination with an industry-standard RJ45 jack and/or other discrete components required to complete a working circuit.

Hardware features

- Based on a second-generation Tibbo ASIC (T2000).
- 10/100BaseT auto-MDIX Ethernet port (no magnetics).
- One serial port (CMOS-level):
 - Baudrates of up to 460'800bps;
 - 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.
- 512KB flash memory; 320KB available for compiled Tibbo BASIC application (this memory cannot be used as a flash disk for application data storage).
- 208 bytes of EEPROM space for data storage.
- 8 general-purpose I/O lines (including 2 interrupt lines) and excluding TX and RX lines of the serial port.

- Control lines for two external dual-function status LEDs.
- Additional control line for a dedicated Ethernet link LED.
- RST input for an external reset source (which is required).
- Power: 260mA @ 3.3V.
- "Vertical slice" construction; dimensions: 18.5x16.0x6.5mm.
- Firmware is upgradeable through the serial port or network (including "cold upgrade" firmware uploads through the network).
- The following will be available at a later date:
 - Optional Wi-Fi interface (will require [GA1000](#) add-on module);
 - Flash disk (will require an external SPI flash IC);
 - Support for external LCD and keypad.

Programming features

- Variable Types: Byte, char, integer (word), short, dword, long, real, string, plus ser-defined arrays and structures.
- Function Groups: Strings functions (21 in total!), date/time conversion functions, and hash calculation functions (md5 and sha1).
- Platform objects:
 - Sock — socket communications (up to 16 UDP, TCP, and HTTP sessions);
 - Net — controls Ethernet port;
 - Ser — in charge of serial ports (UART, Wiegand, and clock/data modes);
 - Io — handles I/O lines, ports, and interrupts;
 - Stor — provides access to the EEPROM;
 - Romfile — facilitates access to resource files (fixed data);
 - Pat — "plays" patterns on up to five LED pairs;
 - Button — monitors MD line (setup button);
 - Sys — in charge of general device functionality.
- The following will be available at a later date:
 - Wln — handles Wi-Fi interface (requires [GA1000](#) add-on module);
 - Lcd — controls graphical display panels (several types supported);
 - Kp — scans keypads of matrix and "binary" types;
 - Fd — manages flash memory file system and direct sector access.