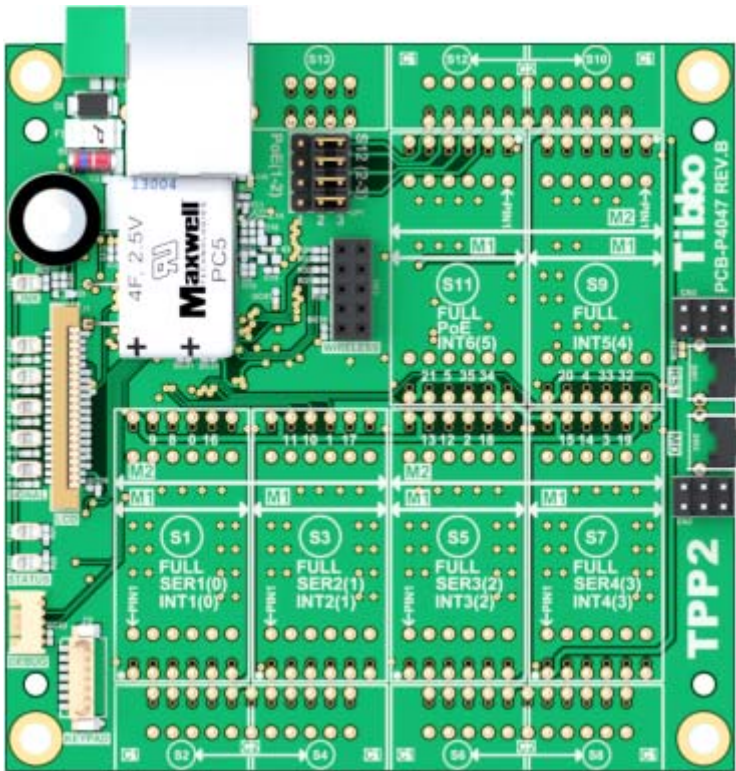


# Size 2 Tibbo Project PCB (TPP2)



## Introduction

Size 2 Tibbo Project PCB is perfect for systems with a medium number of I/O lines. The board can optionally control a TFT display and a keypad, so it is suitable for applications requiring a human-machine interface (HMI).

This product can be used as a bare board or assembled into a [size 2 Tibbo Project Box](#). For HMI applications, the board can also be assembled into the [TPB2L](#) box, which features a 320x240 TFT LCD and a 4-button sensor keypad.

Featuring [3 tiles for a total of 6 "M" and 6 "C" sockets](#), the TPP2 can implement configurations with up to four simple serial ports, up to 12 relays, or up to 24 opto-inputs, PWM, or open-collector outputs.

The TPP2 is perfect for data collection and AutoID projects, as well as factory, shop, data center, hotel, and home automation applications. The board contains enough "C" sockets to simultaneously accommodate [temperature](#), [humidity](#), [pressure](#), [ambient light](#), and [shock](#) sensors. With the use of appropriate Tibbits the board can even [control legacy IR devices](#) by emulating traditional IR remote controls.

## Hardware features

- Based on a high-performance purpose-built 88-MHz T1000 ASIC.
- 10/100BaseT auto-MDIX Ethernet port (automatic detection of "straight" and "cross" cables).
- 3 [tiles](#) (6 x "M" + 6 x "C" sockets, 24 control lines):

- Four "M" sockets with [UART capability](#):

- > 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.

- Six "M" sockets with [interrupt capability](#);

- One "M" socket with [PoE capability](#).

- Optional Wi-Fi interface (requires the [GA1000](#) add-on module).
- Connectors for optional TFT LCD and 4-button sensor keypad.
- 1024KB flash memory for firmware, application, and data storage.
- 2KB EEPROM for data storage.
- RTC with dedicated backup supercapacitor.
- Eight LEDs:

- Green and Red main status LEDs;

- Yellow Ethernet link LED;

- Five blue LEDs (can be used for Wi-Fi signal strength indication or any other purpose).

- Onboard buzzer.
- 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: 300mA @ 5V (100BaseT mode, PLL on, all LEDs off).
- Dimensions: 94x94mm.
- 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 in-circuit emulator, is required.

#### Programming features

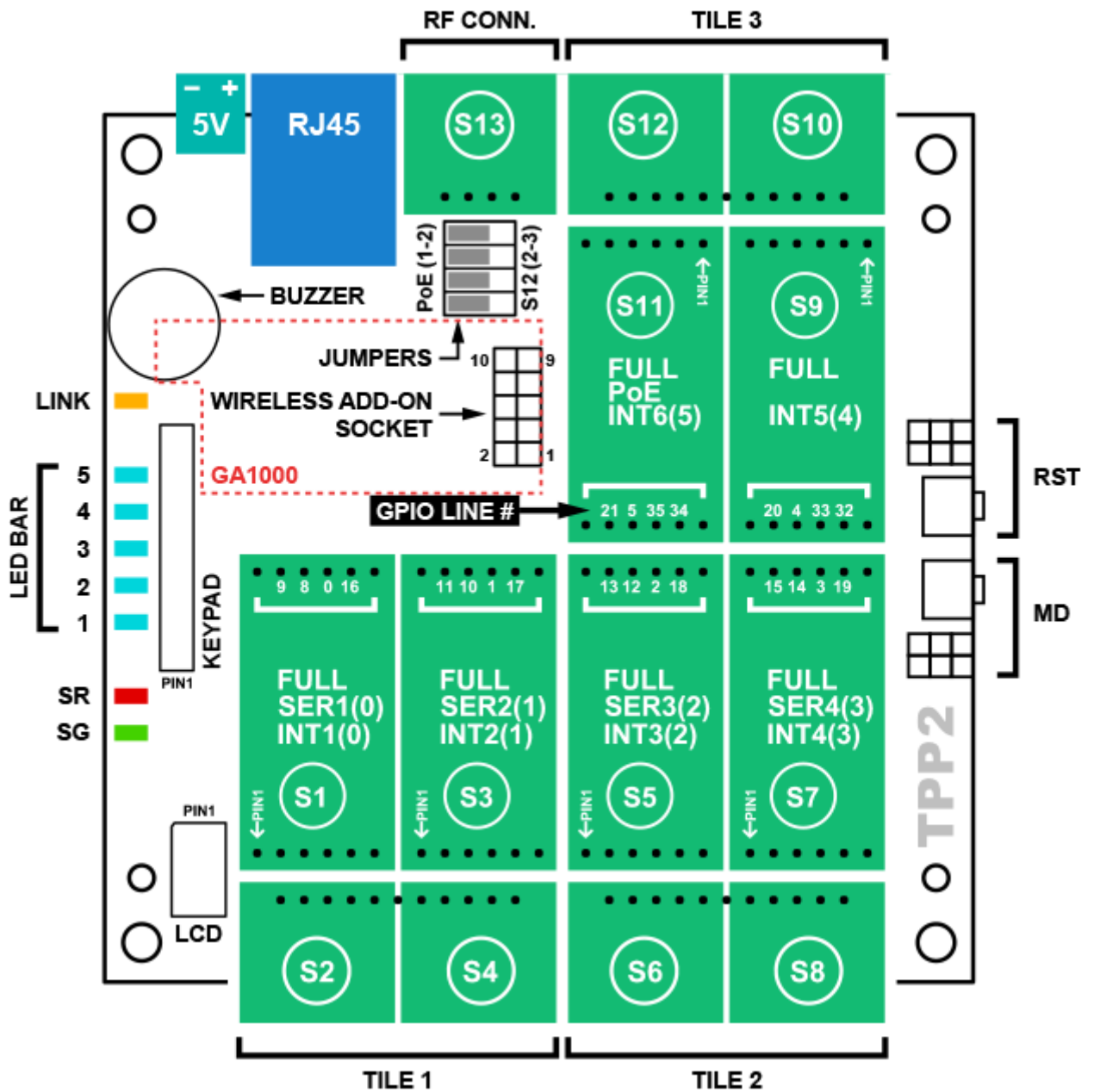
- Variable Types: Byte, char, integer (word), short, dword, long, real, string, plus user-defined arrays and structures.

- 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:

- Lcd — controls the TFT LCD display (optional, connected externally);
- Kp — handles four-button keypad (optional, connected externally);
- Sock — socket communications (up to 16 UDP, TCP, and HTTP sessions);
- Net — controls the Ethernet port;
- Wln — handles the Wi-Fi interface (requires [GA1000](#) add-on module);
- Ssi — implements up to four serial synchronous interface (SSI) channels, supports SPI, I2C, clock/data, etc.;
- Ser — in charge of four serial ports (UART, Wiegand, and clock/data modes);
- Io — handles I/O lines, ports, and six interrupts;
- 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 green and red status LEDs;
- Beep — generates buzzer patterns;
- Button — monitors the MD (setup) button;
- Sys — in charge of general device functionality.

# Tiles, Sockets, Connectors, Controls



The TPP2 board features 6 x "M" and (6+1) x "C" sockets.

Sockets (S1) ~ (S12) form 3 standard [tiles](#).

There are 24 control lines connecting "M" sockets to the CPU -- four per each socket.

Additionally:

- "M" sockets (S1), (S3), (S5), and (S7) have the [UART capability](#).
- "M" sockets (S1), (S3), (S5), (S7), (S9), and (S10) have the [interrupt capability](#).

- "M" socket (S11) has the [PoE capability](#), provided that four TPP2 jumpers are set to 1-2 position (see below).
- "C" socket (S13) exists exclusively for the installation of the RF connector Tibbit [#37](#). This socket has no other functions.

### The jumpers

Four jumpers next to the RJ45 jack define the connection between the "M" socket (S11), "C" socket (S12), and the RJ45 jack:

- When the jumpers are in the 1-2 position, four power lines from the RJ45 jack are connected to four I/O lines of (S11). Under this arrangement you can install an M1 PoE device into the (S11), or M2 PoE device into the (S9)-(S11).
- When the jumpers are in the 2-3 position, the RJ45 jack is disconnected from the socket (S11). The socket (S11) is instead connected to (S12) in a "standard tile way".