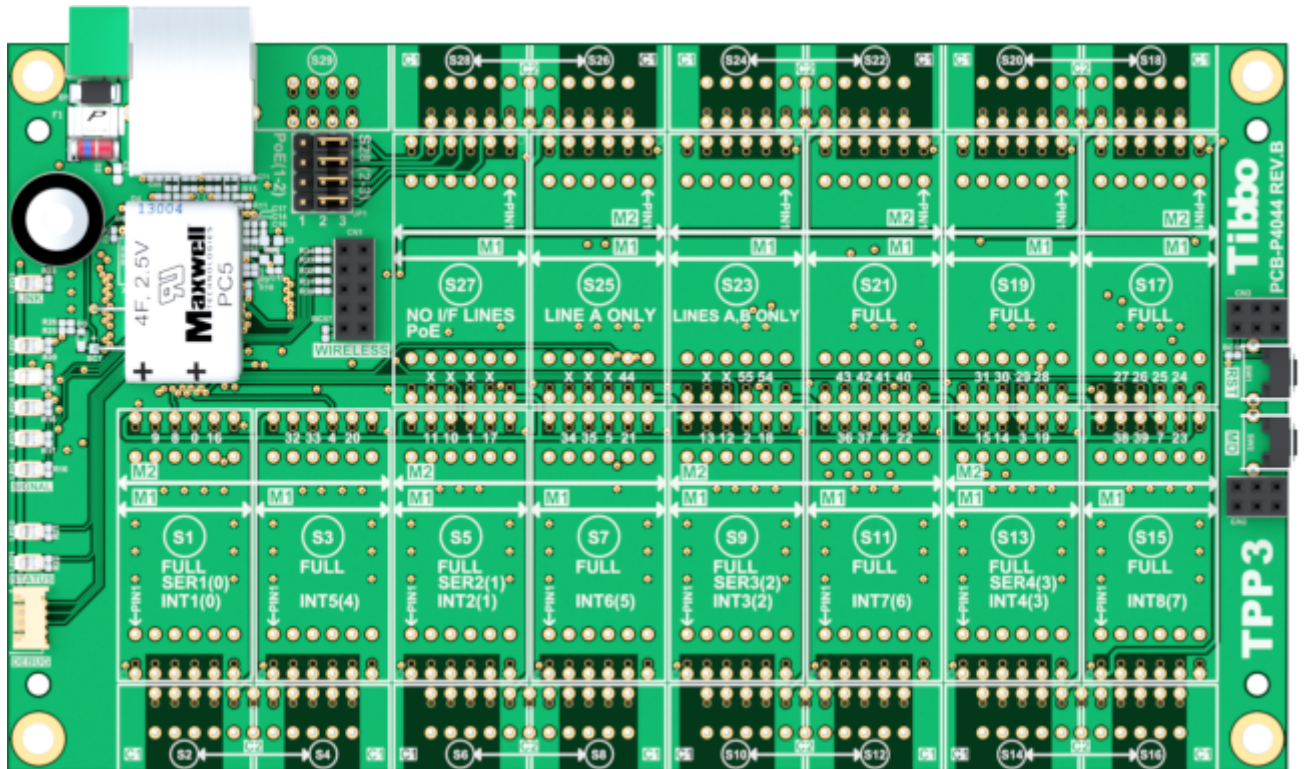


Size 3 Tibbo Project PCB (TPP3)



Introduction

Size 3 Tibbo Project PCB is ideal for applications that require no human-machine interface (HMI) while calling for a significant number of I/O lines and/or functions.

The TPP3 board can be used to replace dumb PLC controllers or work as a safety, security, or access control device. The TPP3 is also ideal for factory, lab, shop, building, hotel, and home automation projects.

Offering [7 tiles for a total of 14 "M" and 14 "C" sockets](#), the TPP3 can be used to construct devices with up to four full serial ports, up to 25 relays, or up to 47 opto-inputs, PWM, or open-collector outputs.

Further, the generous number of available Tibbit sockets means you can increase your system's versatility by offering multiple power supply options, such as +5V, +12V, PoE, etc. You can also install multiple power supply Tibbits to increase total available power or provide power redundancy.

This product can be used as a bare board, or assembled into a [size 3 Tibbo Project Box](#).

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).
- 7 [tiles](#) (6 x "M" + 6 x "C" sockets, 47 control lines):

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

- > 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.

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

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

- Optional Wi-Fi interface (requires [GA1000](#) add-on module).
- 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: 165x94mm.
- 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

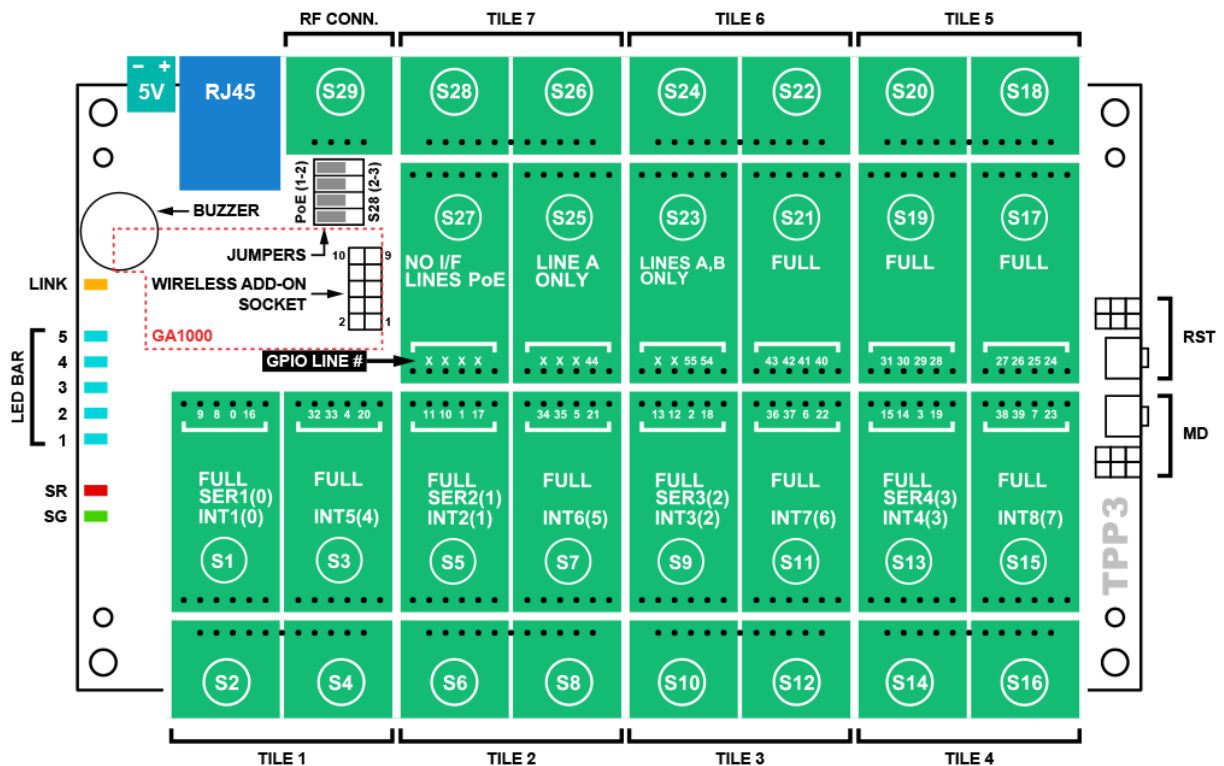
- Variable Types: Byte, char, integer (word), short, dword, long, real, string, plus user-defined arrays and structures.

•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:

- 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 eight 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 TPP3 board features 14 x "M" and (14+1) x "C" sockets.

Sockets (S1) ~ (S28) form 7 standard [tiles](#).

There are 47 control lines connecting "M" sockets to the CPU. The number of control lines is smaller than the number of "M" sockets multiplied by four. This is because some sockets have a reduced number of control lines, or have no lines connected at all:

- Socket (S23) only has control lines A and B. Control lines C and D are not implemented.
- Socket (S25) only has the control line A. Control lines B, C, and D are not implemented.
- Socket (S27) has no control lines connected to it.
- Remaining "M" sockets have all four control lines implemented.

Additionally:

- "M" sockets (S1), (S5), (S9), and (S13) have the [UART capability](#).
- "M" sockets (S1), (S3), (S5), (S7), (S9), (S11), (S13), and (S15) have the [interrupt capability](#).
- "M" socket (S27) has the [PoE capability](#), provided that four TPP2 jumpers are set to 2-3 position (see below).
- "C" socket (S29) 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 (S27), "C" socket (S28), 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 (S27). Under this arrangement you can install an M1 PoE device into the (S27), or M2 PoE device into the (S25)-(S27).
- When the jumpers are in the 2-3 position, the RJ45 jack is disconnected from the socket (S27). The socket (S27) is instead connected to (S28) in a "standard tile way".