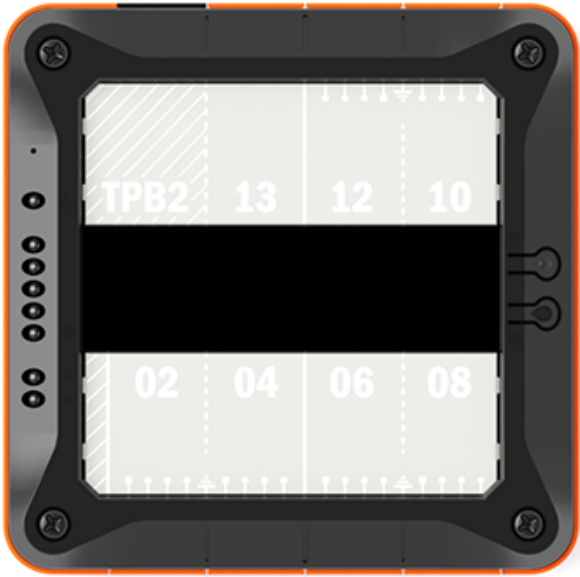


ModbusMQTTGateway

Features and Benefits

Certifications



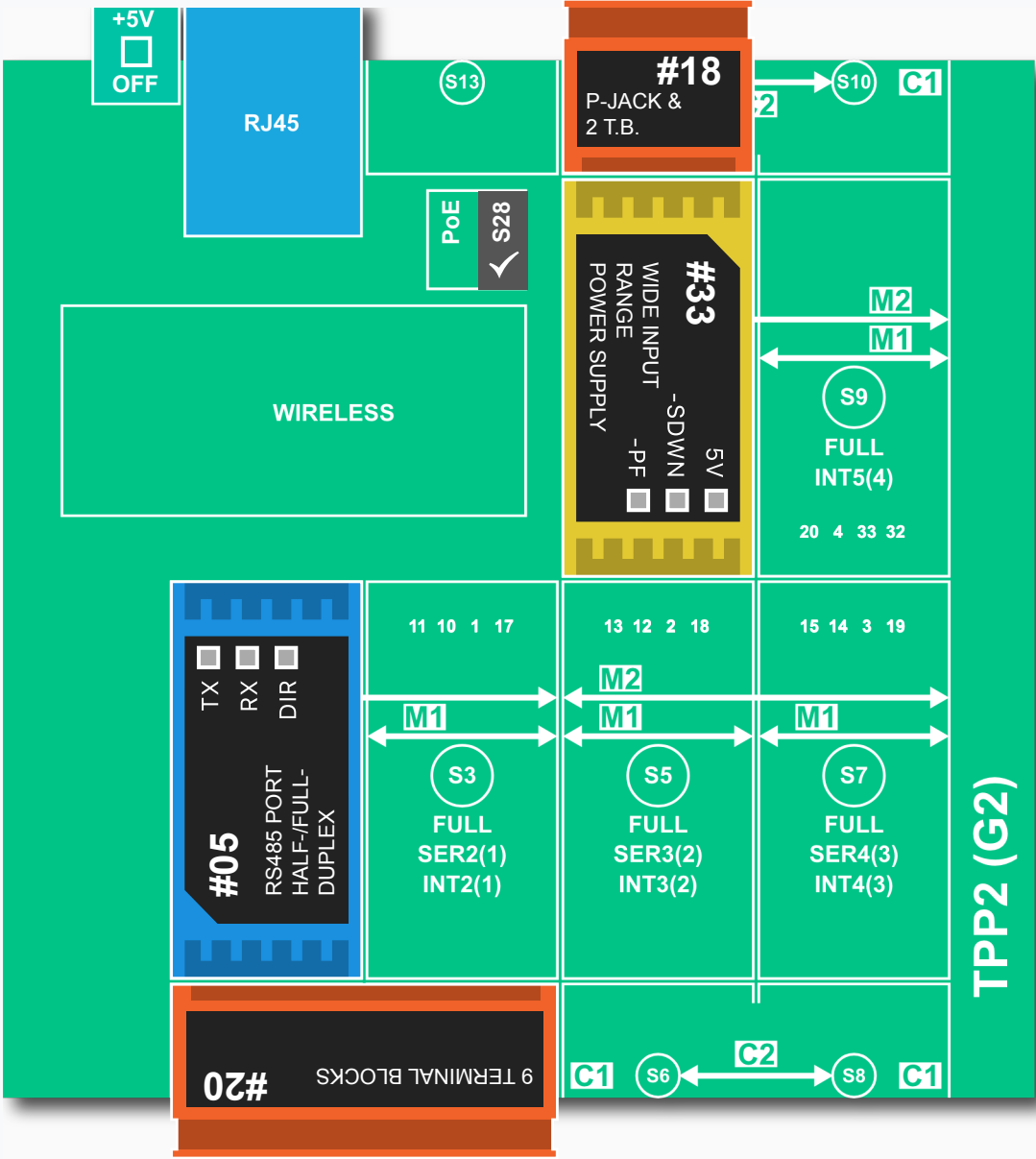
Certification	
CE	TPP2G2
FCC	TPP2G2
Shock	Shock Cert.
Vibration	Vibration Cert.

Hardware	
Operating temperature range	-40 ~ +70°C
PCB	(LxW): 94 x 94mm
TPB2	(LxWxH): 105 x 105 x 39mm

Ethernet	
10/100BaseT(X) Ports (RJ45 connector)	1
Magnetic Isolation Protection	1.5 kV (built-in)

Software Protocols	
MQTT Client	MQTT 3.1.1
HTTP Client	HTTP 1.1
HTTP Server	HTTP 1.1

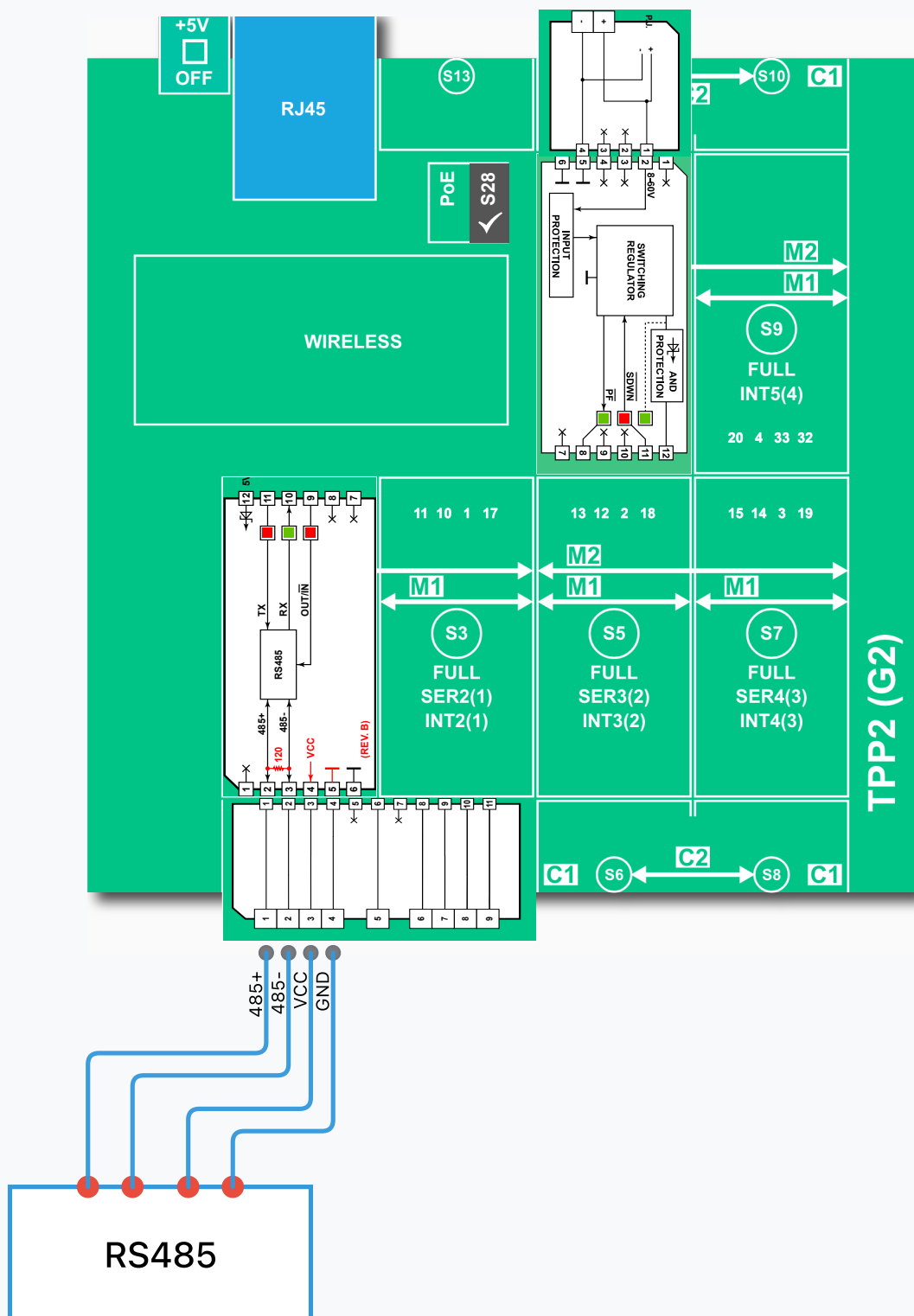
Tibbits Configuration



Tibbits		
No.	Description	Qty.
18	Power jack and two terminal blocks.	1
20	Nine terminal blocks.	1
33	8-60V input voltage (12V/24V/48V) 1.5A output current with spikes up to 2A	1
05	RS485 port with full-duplex or half-duplex operation (provides 5V output).	1

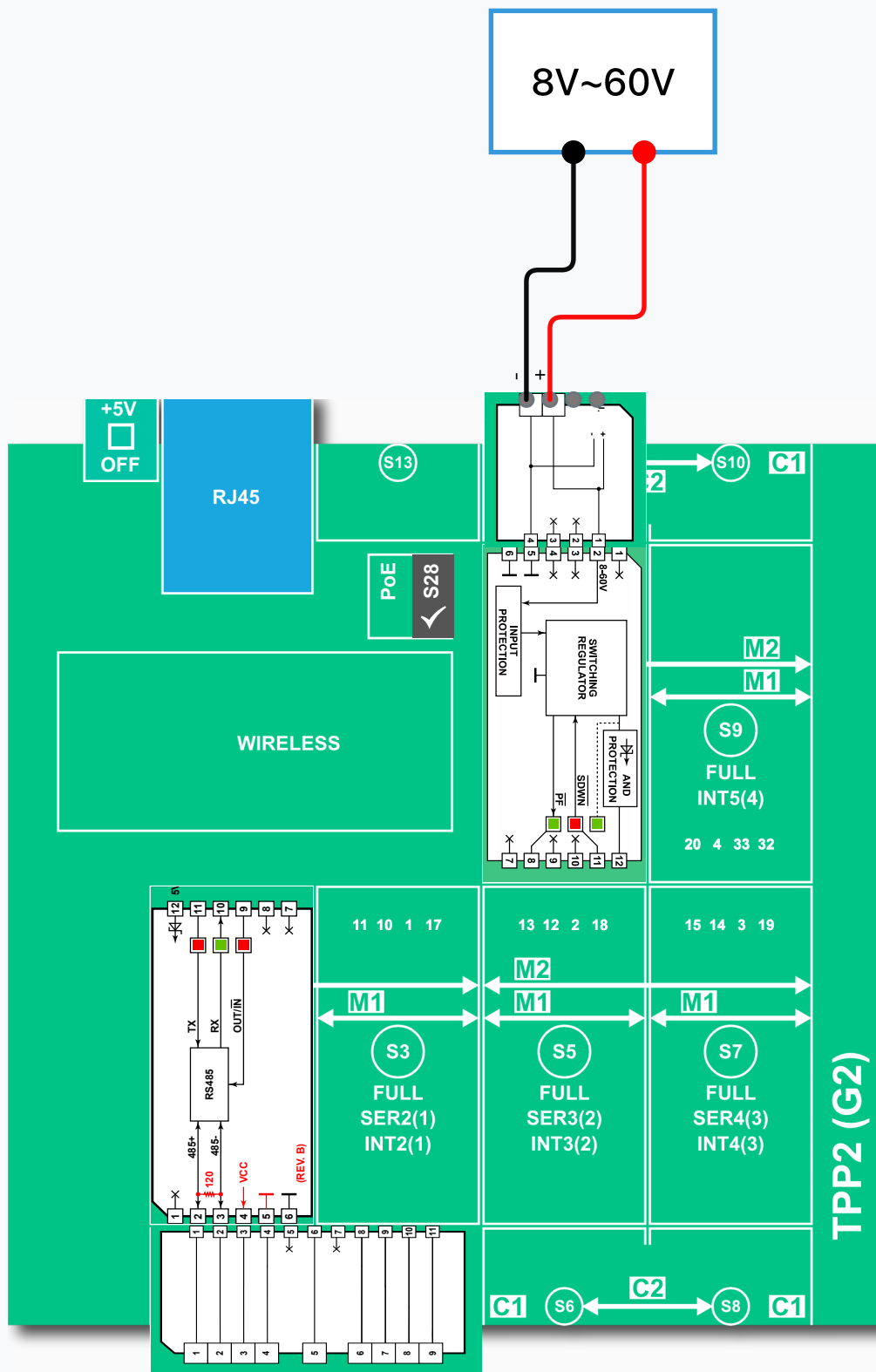
Tibbit #05 Wiring (Socket 1)

RS485 port with full-duplex or half-duplex operation (provides 5V output).

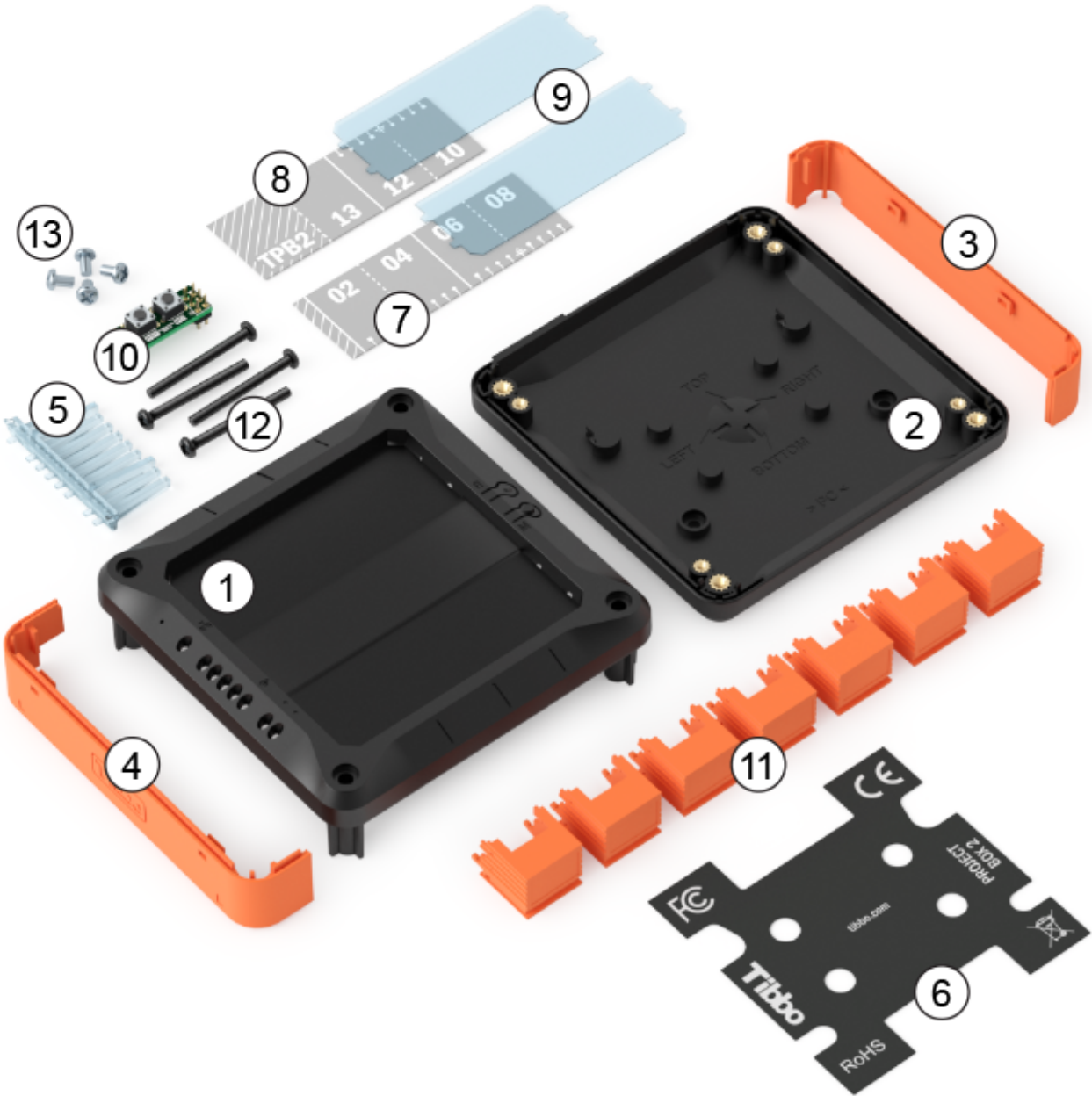


Tibbit #33 Wiring (Socket 11)

8-60V input voltage (12V/24V/48V) 1.5A output current with spikes up to 2A



Parts and Accessories

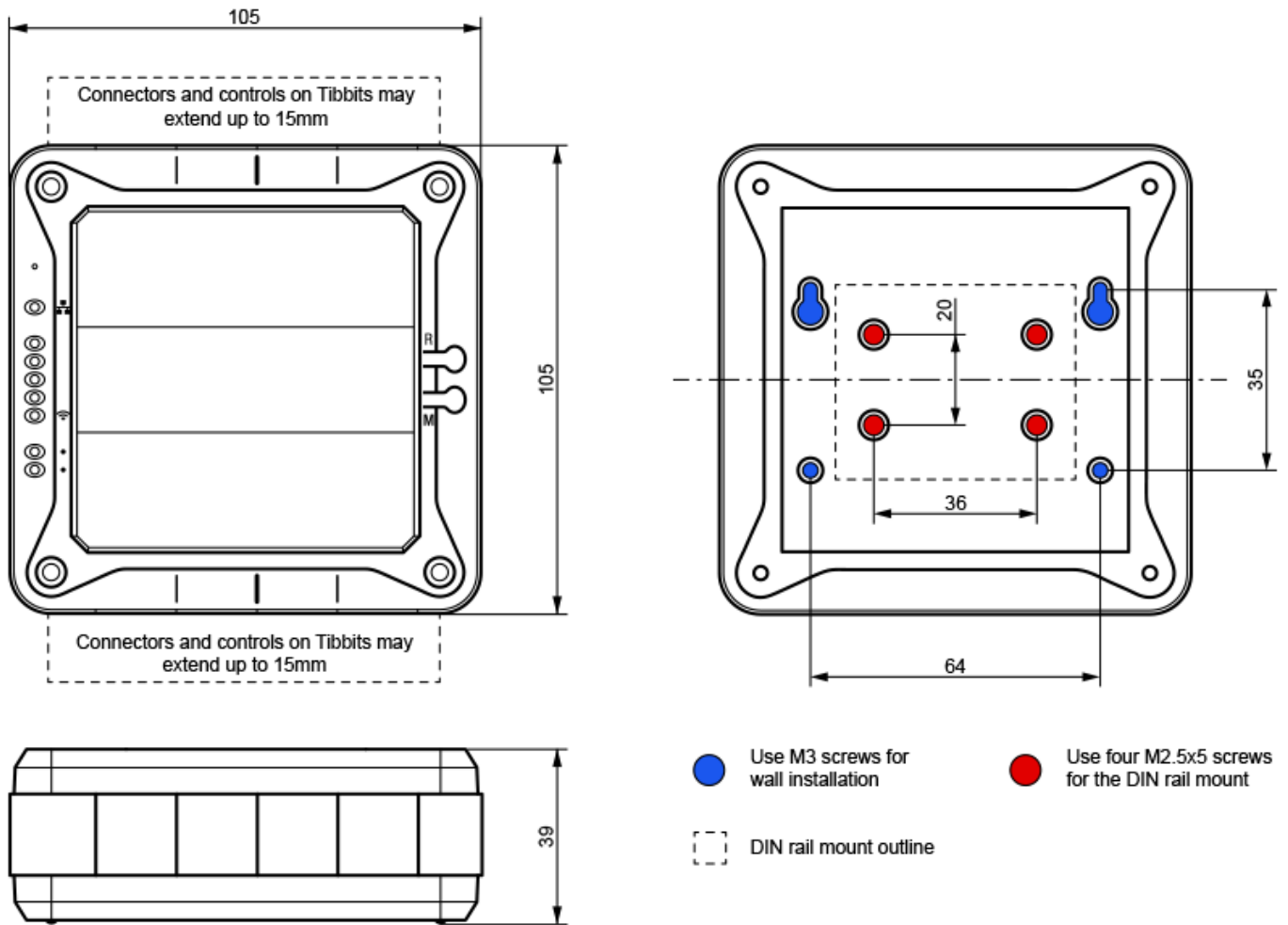


Parts included in the TPB2 kit			
No.	Part	Description	Qty.
1.	PM01P1054	Top cover (TPB2)	1
2.	PM01P1055	Bottom cover (TPB2, TPB2L)	1
3.	PM01P1049	Right side wall (all TPB models)	1

4.	PM01P1050	Left side wall (all TPB models)	1
5.	PM06P1004	LED light guide (all TPB models)	1
6.	PM03P1017	Back label (TPB2, TPB2L)	1
7.	PM921009	Paper insert, bottom row (TPB2)	1
8.	PM921010	Paper insert, top row (TPB2)	1
9.	PM03P1020	Paper Insert Cover (TPB2)	2
10.	PCB-P2164	MD/RST button PCB (all TPB models)	1
11.	PM12P1001-03	Blank Tibbit shell, C1 form factor, orange	7
12.	SM3R5+32SPBC	Main Screw — 2.5mm hex socket, 3.5mm x 32mm thread (all TPB models)	4
13.	SM2R6+05SPNC	PCB screw (all TPB models)	4

The [TPB2](#) can be purchased with an optional DIN rail mounting kit and an available [vibration protection kit \(VPK\)](#), with which [Tibbo Project System \(TPS\)](#) devices meet the shock and vibration resistance requirements of the IEC 60068-2-27 standard.

Mechanical Dimensions



Dimensions are for reference only. Tibbo assumes no responsibility for any errors in this manual, and does not make any commitment to update the information contained herein.

#18, C1: Power Input



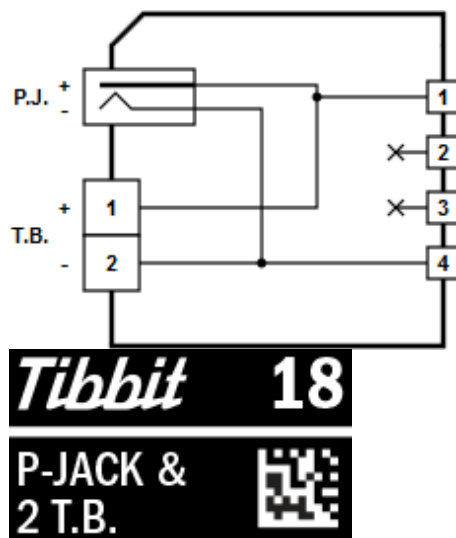
Function: Power jack and two terminal blocks

Form factor: [C1](#)

Special needs: ---

Power requirements: ---

See also: [#19](#), [#20](#), [#21](#)



Details

Tibbit #18 is a straightforward [C1 module](#) that implements a power jack and a two-pin terminal block.

Note: Do **not** connect active power sources to both the power jack and terminal block at the same time. Doing so will likely result in damage to the [Tibbit](#).

#20, C2: Nine Terminal Blocks



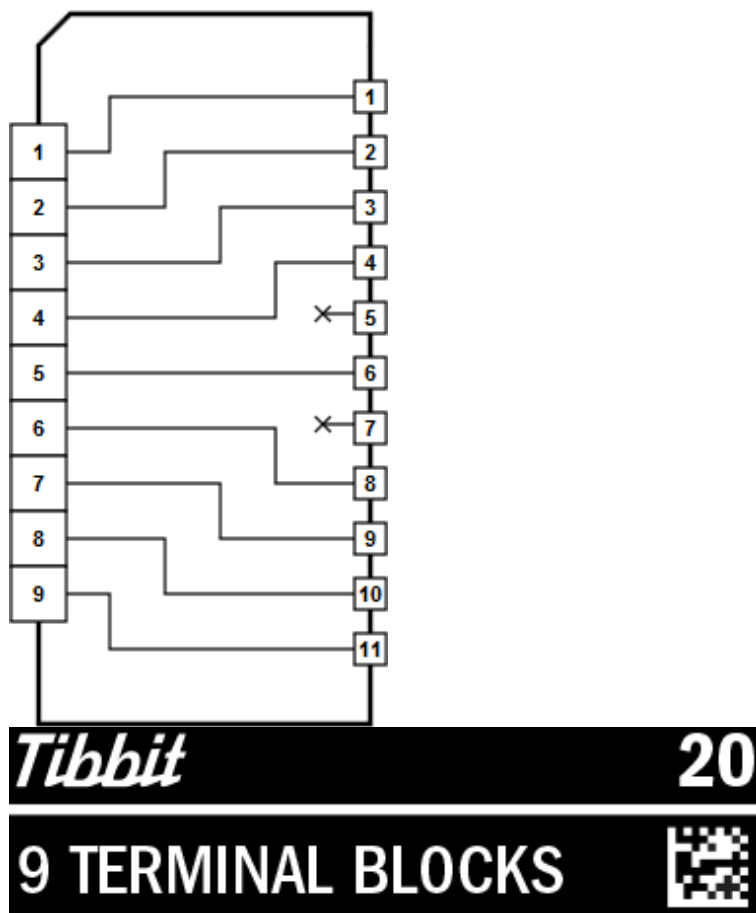
Function: Nine terminal blocks

Form factor: [C2](#)

Special needs: ---

Power requirements: ---

See also: [#18](#), [#19](#), [#21](#)



#33, M1T: Wide Input Range Power Supply



Function: Wide input range power supply with 5V output, shutdown control, and power failure detection

Form factor: [M1T](#)

Category: Power supply module

Special needs: [\[INT\]](#) (optional)

Input voltage: 8–60V (accepts voltage dips down to 6V and spikes up to 100V)

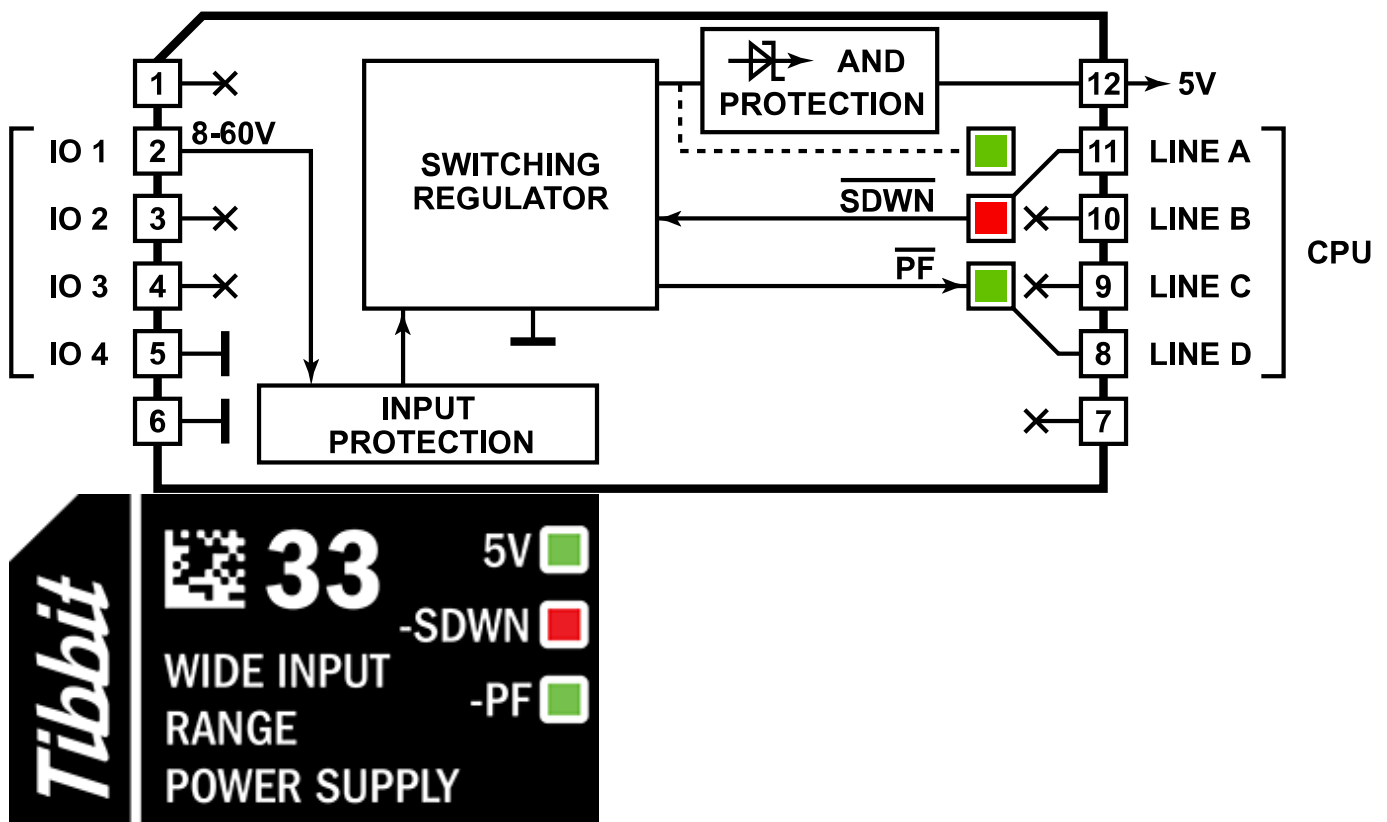
Output voltage: 5V

Output current: Continuous 1.5A and peaks up to 2A

Temperature range: –40°C to +85°C

Mates with: [#18](#), [#19](#), [#20](#), [#21](#)

See also: [#09](#), [#10](#), [#12](#), [#23](#), [#25](#)



Details

Tibbit #33 is ideal for powering [Tibbo Project System \(TPS\)](#) devices from the popular 12V, 24V, and 48V DC

spikes up to 100V, which makes it suitable for battery-powered and automotive applications. Tibbit #33 also features transient input voltage, reverse input voltage, reverse output current, output current (short circuit), and temperature (overheating) protection.

Multiple Tibbits #33 can be used to increase the available current, for power redundancy, or for load sharing⁽²⁾.

Combine Tibbit #33 with [#18](#) (it has a power jack and two terminal blocks), [#19](#) (DB9M), [#20](#) (nine terminal blocks), or [#21](#) (four terminal blocks).

1. To ensure your system's reliability and longevity, derate this value for input voltages above 48V, especially in high ambient temperature conditions. While driving the Tibbit at the specified maximum current will not lead to an immediate failure, it may reduce the Tibbit's life. We recommend a maximum current of 1.3A for sustained operation at input voltages above 48V. When in need of higher currents in harsh conditions, consider using more than one power Tibbit for load sharing.
2. Be aware that when you use multiple power Tibbits, their grounds (IO4) are interconnected (tied together) through the TPS.

Control Lines

- Tibbit #33 has a dedicated shutdown (–SDWN) line. Pull the line LOW to disable the Tibbit.
- The Tibbit also features a power fail (–PF) output. The following table details the output's state under different operating conditions:

Table 1 — –PF Line States	
Condition	–PF Line State
The switching regulator is on and is able to maintain the output voltage within the 4.5–5.5V range	HIGH (no power failure)
The switching regulator is on, but the output voltage is outside of the 4.5–5.5V range (for example, because of excessive load or insufficient input voltage)	LOW (power failure)
The switching regulator is shut down (the –SDWN line is driven LOW)	LOW (Tibbit powered off)

Table 1 — –PF Line States

Input power removed from the Tibbit's power input (IO1)

When the input power is removed, the output voltage of the Tibbit will start to drop. Once the output voltage falls below 4.5V, the state of the –PF line will change to LOW. As the output voltage continues to drop, it will eventually reach the point where the Tibbit's switching regulator is unable to operate, at which point the –PF line will switch back to HIGH. Hence, disconnecting the input power will cause a negative pulse on the –PF line. The pulse is typically 50–100ms in duration. It can be detected by the TPS' GPIO line running in the interrupt mode.

Note: Tibbo recommends monitoring the –PF line with an interrupt routine instead of polling the status of the line. Using interrupts will help catch transient failures or instabilities that cannot be detected through polling.

LEDs

Tibbit #33 features two green LEDs and one red LED:

- The green "5V" LED is connected to the 5V output of the Tibbit's switching regulator. It is on when the regulator is outputting power. The LED will be off when the regulator is not outputting power, even if the host TPS system is receiving power from some other source (for example, a second Tibbit #33).
- The red –SDWN LED turns on when the host processor pulls the –SDWN line LOW, thus disabling the Tibbit's switching regulator.
- The green –PF LED is on when the corresponding –PF line is LOW. –PF line behavior is detailed in the table above.

Library Support

Tibbit #33 works as soon as a power source is connected, and no code is required to make the Tibbit function in your system. If you want to monitor the –PF line, you can use an interrupt line. You can use [AppBlocks](#) for configuration and creating your application. It will also help you implement the shutdown, reset, and restart mechanisms for your application.

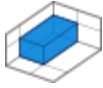
Additional Info

[Specifications](#)

[Efficiency Data](#)

[Handling Current and Power Spikes](#)

#05, M1S: RS485 Port



Function: RS485 port with half-duplex operation

Form factor: [M1S](#)

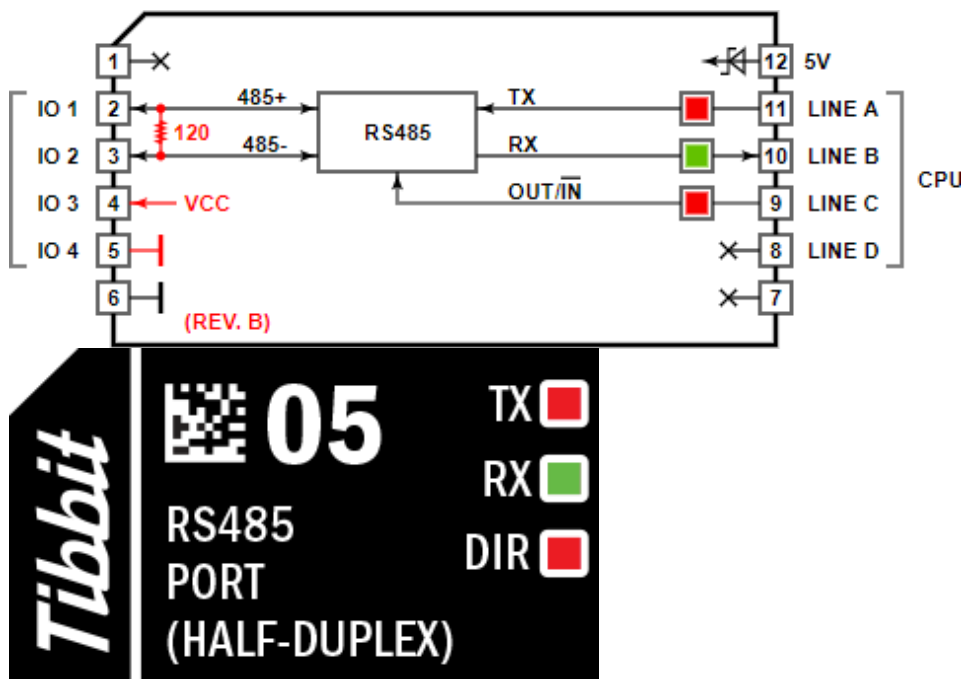
Category: Input/output module

Special needs: [\[SER\]](#)

Power requirements: 5V/15mA

Mates with: [#19](#), [#20](#), [#21](#)

See also: [#01](#), [#02](#)



Details

This serial port offers a single pair of +/-485 lines. Hence, it can only communicate in half-duplex mode.

Direction control is through the RTS line — the line must be LOW for data input (data flowing into the host [Tibbo Project PCB](#)) and HIGH for output.

For proper operation, the RTS line must be mapped and configured to be an output. This can be accomplished through the [ser.rtsmap](#) and [io.enabled](#) properties.

Combine Tibbit #05 with terminal block devices — [#20](#) (nine terminal blocks) or [#21](#) (four terminal blocks).

Tibbit Versions

The original version of this [Tibbit](#) made no use of IO3 and IO4.

Revision B of this Tibbit provides 5V power on IO3 and GND on IO4. There is also an onboard 120Ω termination resistor (0402 package) between the +/–RS485 lines. This resistor was added for the convenience of users.

Revision B devices are marked by a small round sticker with the letter "B" on the side of the Tibbit.

LEDs

There are three LEDs: two red and one green. The red LEDs are connected to the TX and OUT/–IN outputs. The green LED is for the RX input. All LEDs are buffered (with logic gates) and light up for the LOW state of their respective lines.



VCC output (IO 3) of this Tibbit is taken from the 5V rail of the TPS. When heavy loads are placed on the VCC output, the current draw from the TPS 5V rail can increase significantly. Therefore, make sure you use a reliable power Tibbit or another robust method of powering the TPS to avoid any power dips. For the same reason, caution should be taken when using multiple instances of this Tibbit on a single TPS board.