UPB32
UNIVERSAL PROJECT BOARD

Manual and specification

WARNING ! WARNING ! WARNING ! WARNING ! WARNING ! WARNING ! WARNING !

UPB32 BOARD OUTPUT TO CONTROLLER IS NOT CALIBRATED – BEFORE INSERTING
CONTROLLER, PLEASE READ SECTION **III. EASY START** OF THIS DOCUMENT -
OTHERWISE IT WILL BE DAMAGED BEYOND REPAIR.
CHECK OUTPUT VOLTAGE AGAIN WHILE YOU CHANGE ADAPTER !

WARNING ! WARNING ! WARNING ! WARNING ! WARNING ! WARNING ! WARNING !

REQUIREMENTS AND HINTS:

- Base knowledge how to handle electronic devices ie. Touch USB connector before manipulation and handle
  parts by holding their edges, don't ride on chair or shove feet to avoid creation of static charge..
- How electricity works - Ohm law is a friend..
- Multimeter for initial calibration and later to verify pin or cable outputs voltage / position
- PH1 screw driver to calibrate board output.
- While you connecting accessories – disconnect power supply.

TABLE OF CONTENTS:

I.   DESCRIPTION

UPB32 will speed up your controller development and let you use the same device as a final product too.
It is originally developed for 9102 version of TTGO - LILYGO® - ESP32 controller and other in the future
released controller's where bracket distance, Power and Ground pin's match below indicated position.

I/O (input outputs) are assembled by standard JST connectors connected in same logical order.
UPB32 using all available TTGO I/O without limitation of any integrated functions as
SD-CARD, GPS, Bluetooth, WiFi.

PnP architecture: Removable controller & optocoupler, wide voltage range of DC power I/O and possibility to
program controller while powered by adapter at the same time – uninterrupted development.

II. BOARD CONNECTION DETAILS
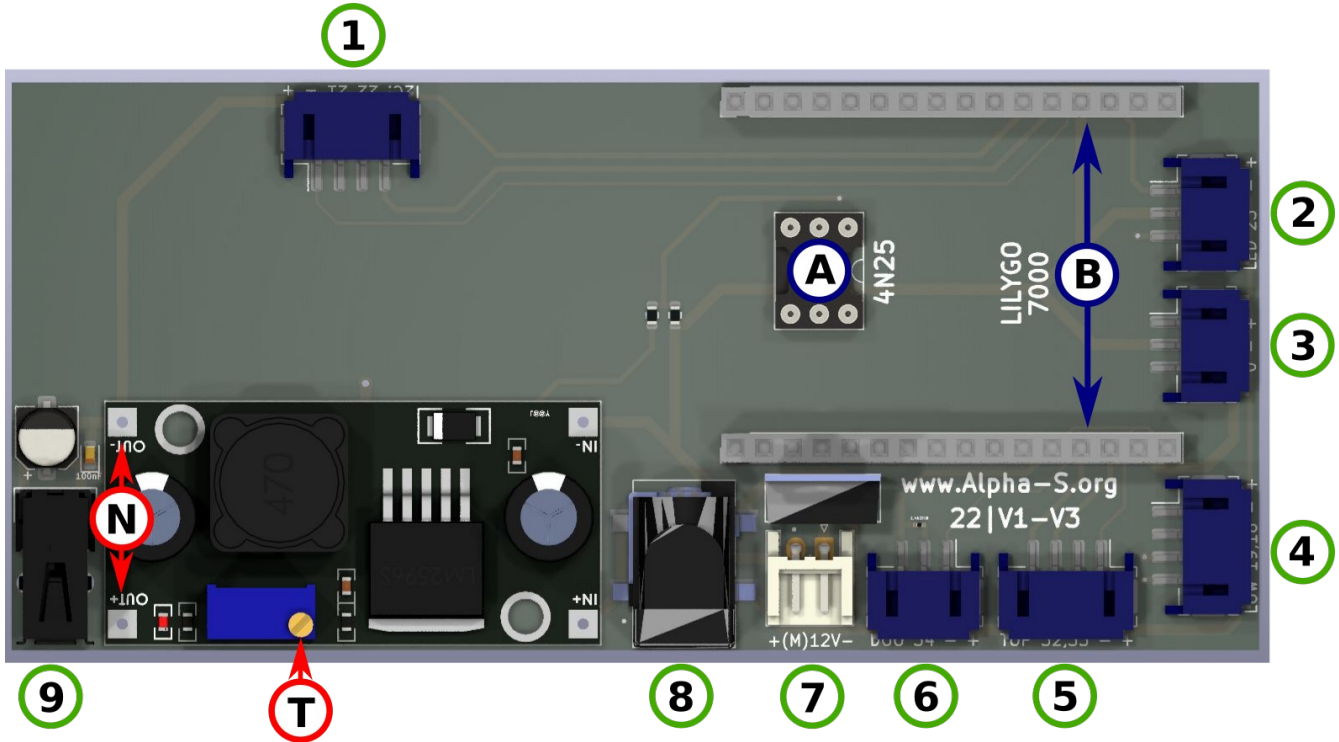
Position	Conn. Type	Proffered I/O	RX*	TX*
1	JST4P	I2C	22	21
2	JST3P	Digital I/O PWM	23	
3	JST3P	Digital I/O PWM	0	
4	JST4P	Digital I/O PWM/UART	19	18
5	JST4P	Digital I/O PWM/UART	32	33
6	JST3P	Digital input 1. pin or 2. pin with 1.4kOHM.	34	
7	JST2P	Output voltage is equal adapter input	5 via (B) and Darlington	
8	Barrel jack 5.5x1.25	DC 12-36V		
9	USB-B	5V 1 A	N/C	N/C

Position	Conn. Type	Used with
A	DIP-6	4N25 pin-out: 1+; 2 -; 5 +5V; 6 +impulse)
B	Pair of 16 pin Header connector 1x 2.54mm	Spacing 31mm |1.2 inch

* If applicable

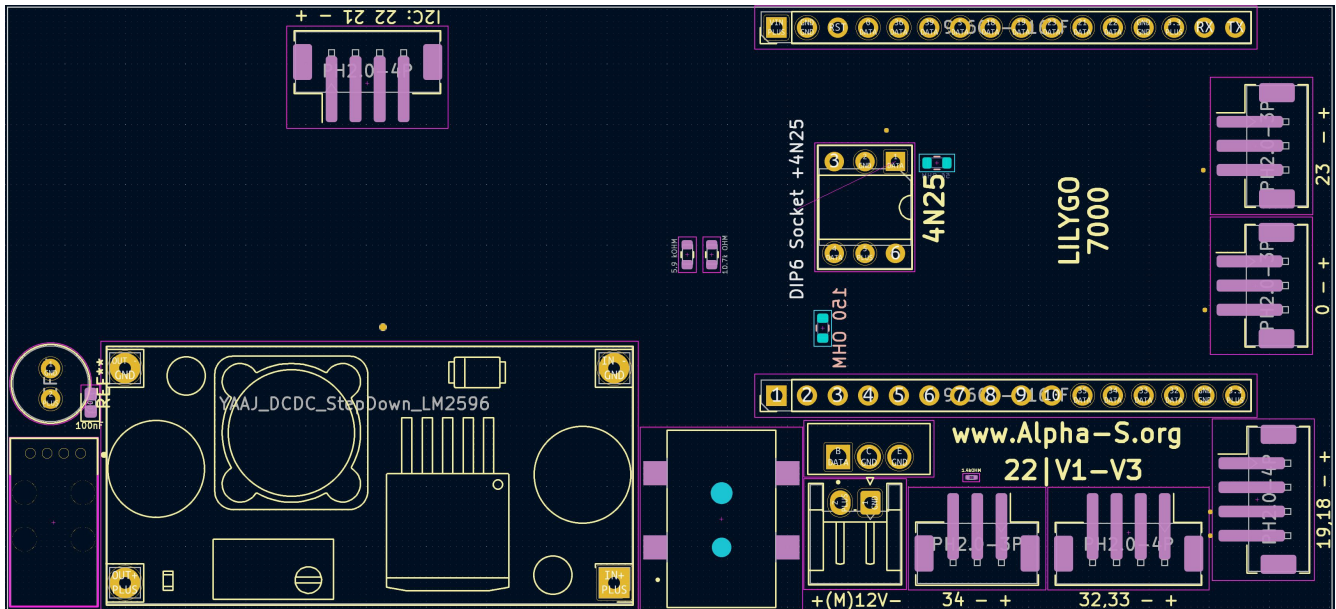UPB32 dimensions: 110 x 50 x 18 mm | 4.33 x 1.96 x 0.7 inch
Weight: 20g | 0.7 oz
Operating temperature: -35 +80°C | -31 +176°F

III. EASY START

1. Unpack UPB32 and verify its not physically damaged. Keep UPB32 bare without controller !
2. If board contain silver hologram sticker – it's calibrated for 12V already.
3. Prepare your Multimeter and set it to your DC Adapter working range.
4. Locate screw "T" on blue Trimmer and use corresponding size screw driver (PH1).
5. Plug Adapter to UPB32 and keep measuring voltage on pin's "N" and at the same time rotate by Trimmer "T" anti- clockwise as long as measured voltage is 5-5.05V. <u>Disconnect Adapter !</u>
6. Insert controller and start to program it in your favorite IDE.

Description on UPB32 is identical with PIN-out of LILYGO® TTGO T-SIM7000 module.
While using different controller than described – always double check Input, Ground pins match.

IV. TTGO PARAMETERS AND TESTED CONTROLLERS

UPB32 with assembled LILYGO® TTGO T-SIM7000G/7400 module:

Dimensions: 110 x 50 x 32 mm | 4.33 x 1.96 x 1.25 inch
Weight: ~65g | ~2.29 oz
If you are not using battery in your project and prefer compact size, de-solder battery holder.
Height without holder: 22mm | 0.86 inch

General TTGO LILYGO controller parameters:

CHIP Dual Core ESP32 - 4(8)Mb Flash + 8Mb PSRAM, W-Rover-B, SIM7000G GSM modem with Nano-SIM.
Bluetooth 4.2BR\EDR, Wi-Fi (2400M~2483.5M 22dBm), 3.6V & 18650 Battery Holder, Solar charging 4.4-6V
780mA, GPS, USB to TTL: CP2104, USB-C connector to power and program. Working current ~200 mA.

Tested compatible controllers in 8-2022:
TTGO LILYGO 7000, TTGO LILYGO 7400.

V. PIN TO PIN AND SCHEME

ESP32 SIM Card T-SIM7000G V1.0
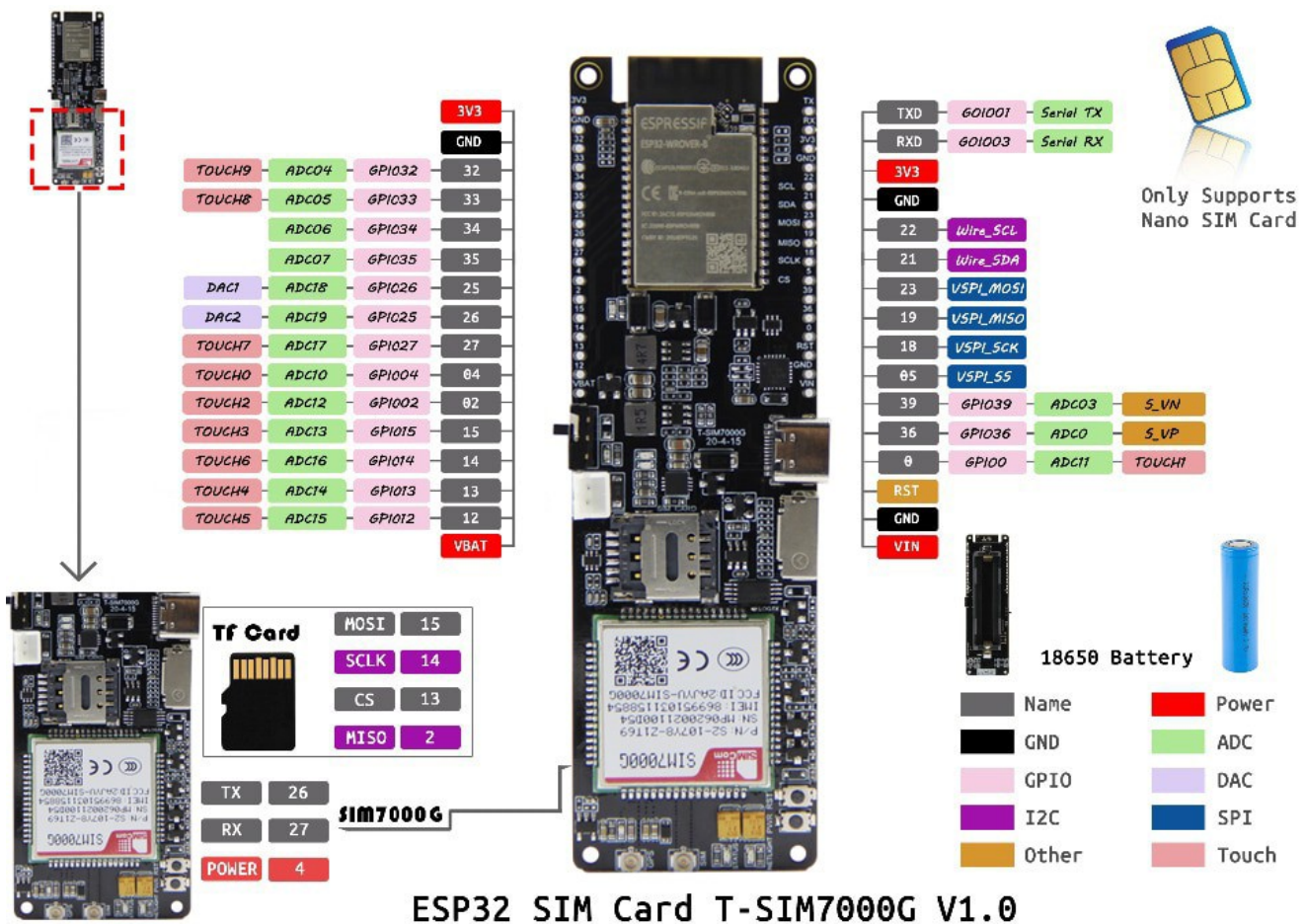
Input voltage can be measured on Analog pin 36 [0-4095].
N/C pins: PIN1 – (bottom left) till pin 11 = 35 – SD CARD. Third on top = RST, 39 – SD CARD, RX TX (last pair)

VI. RESOURCES & EXAMPLES

Resources for LiliGO controller based projects - feel free to use controller manufacturer maintained GITHUB repository:
https://github.com/Xinyuan-LilyGO/LilyGo-LoRa-Series
If files are N/A anymore our backup site: https://www.alpha-s.org/DLD/LilyGO-T-SIM7000G-master.zip

3D printable folding box: https://www.alpha-s.org/DLD/2022-V1-V3.STEP

Dashboard: https://www.alpha-s.org/Dashboard