ATL-100 (Multiparametric Station)

Components Format: THT

Internal Modules:
- MCU (ESP32-S3)
- XL4005 (Voltage Regulator - Step Down)
- Voltage Sensor (power supply voltage)
- HW-519 (RS-485)
- RGB LED

External Modules:
- BME-280 (I2C port)
  - Air Temperature (°C)
  - Air Humidity (%)
  - Atmospherical Pressure (mmHg)
- Pluviometer (pulse port)
  - Rain Amount (mm)
- Anemometer (pulse port)
  - Wind Speed (m/sec. or Km/h)
- Windsock (ADC port)
  - Wind Direction (N, NE, E, SE, S, SW, W, NW)
- ADC 4mA - 20mA (4x ports)
- Soil Sensor (RS-485 port)
  - Temperature (%)
  - Moisture (°C)
  - PH (index)
  - Conductivity (µs/cm)
  - Nitrogen (mg/Kg)
  - Potassium (mg/Kg)
  - Calcium (mg/Kg)

BME280
Air Temperature: -40°C ~ 85°C (0,01°C / ±1°C)
Air Humidity: 0% ~ 100% (0,008% / ±3%)
Atmospheric Pressure: 300hPa ~ 1100hPa (0,18hPa / ±1hPa)
I2C Addr: 0x76 (SDO Low)
0x77 (SDO High)

DS18B20
Soil Temperature: -55°C ~ 125°C (0,01°C / ±0,5°C)
Resolution: 9 ~ 12 (adjustable)

Power Supply | MCU | Analog Inputs

Terminals | RS-485 | LTE

Total Supply Current: ??mA (??mA)
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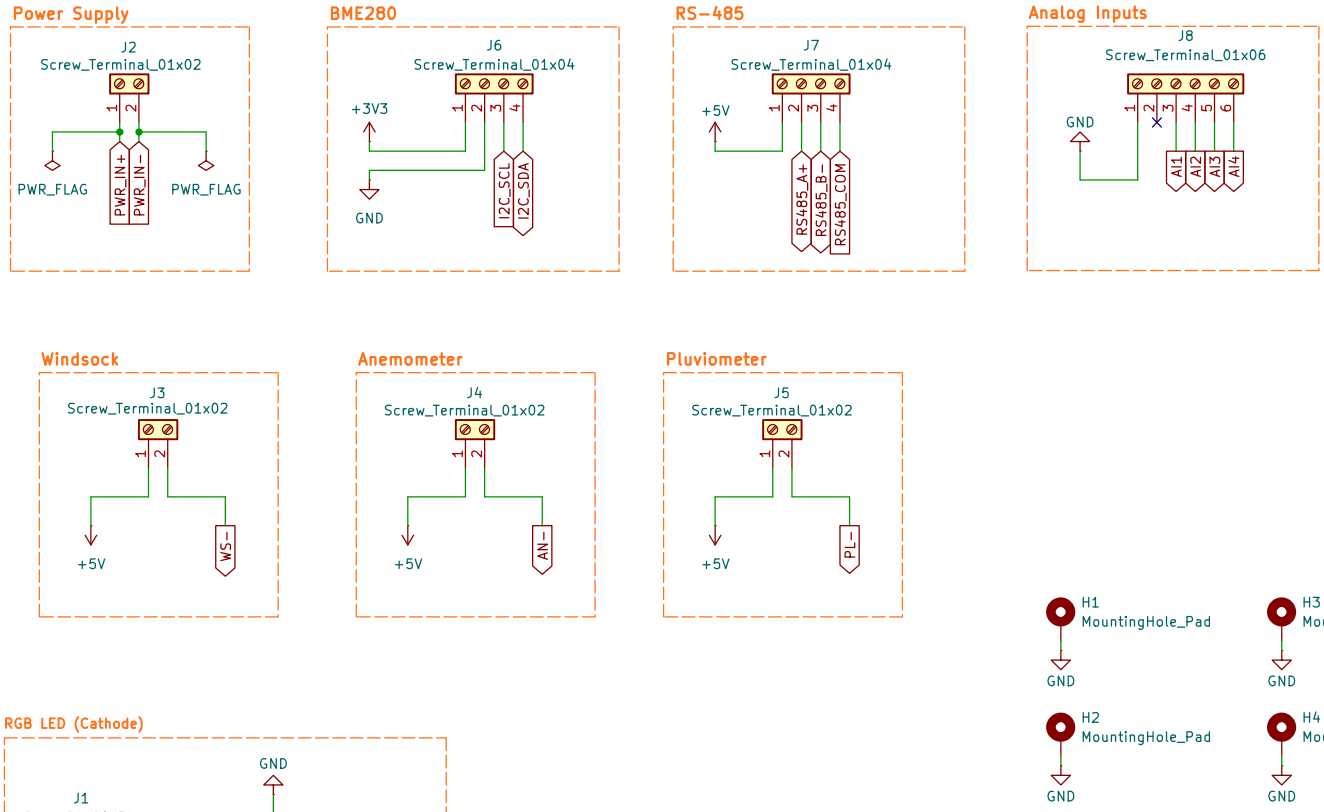
File: atl100_tht.kicad_sch

Title: ATL100 (Multiparametric Station) - THT Based

Size: A4	Date: 2024-10-29	**Rev: v1.0.0**
KiCad E.D.A. 8.0.6		Id: 1/7



Terminals
Author: Robson Costa (robson.costa@ifsc.edu.br)
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Sheet: /Terminals/
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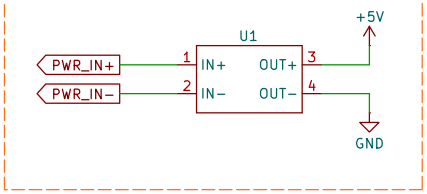
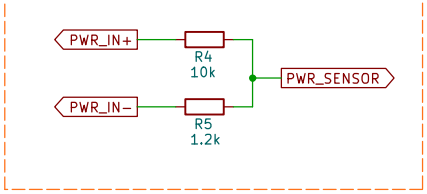
Power Supply
Input: +5V ~ +30V (DC)
Output: +0,8V ~ +24V (DC) – adjustable
Current: +2.5A / +5A (with heat sink)
Conversion efficiency: >90%
Switching Frequency: 300kHz
Maximum Output Power: 80W
Maximum Voltage Fluctuation: ±30mV

XL4005 Module



Voltage Sensor



Power Supply (Max. Supply Current: 2.5 A)
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Sheet: /Power Supply/
File: atl100_power_supply.kicad_sch

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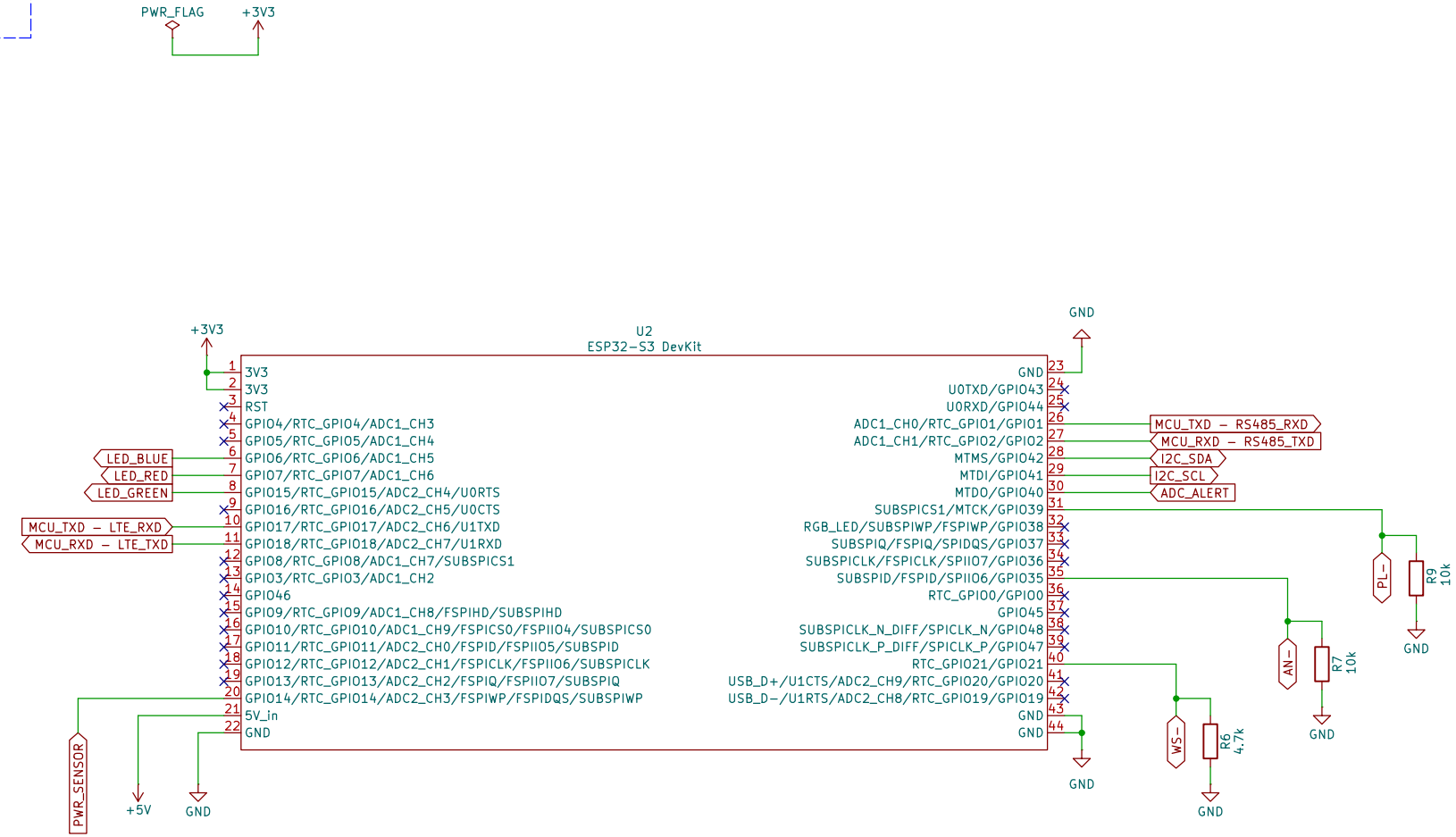
MCU (ESP32S3N16R8)
CPU: RISC 32 bits Dual Core 240MHz
Flash: 16Mb
SRAM: 512Kb
SRAM in RTC: 16Kb
PSRAM: 8Mb
ROM: 384Kb



MCU (Max. Supply Current: 405.3 mA)
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Sheet: /MCU/
File: atl100_mcu.kicad_sch

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Size: A4	Date: 2024-10-29	**Rev: v1.0.0**
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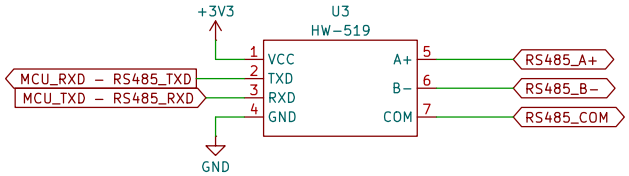
RS-485 (HW-519)
Mode: Half-Duplex
Protection: Thermal Fuse
Noise Reduction: Transient Suppressor Diodes

HW-519 (RS-485 Interface)



RS-485
Author: Robson Costa (robson.costa@ifsc.edu.br)
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Size: A4	Date: 2024-10-29	**Rev: v1.0.0**
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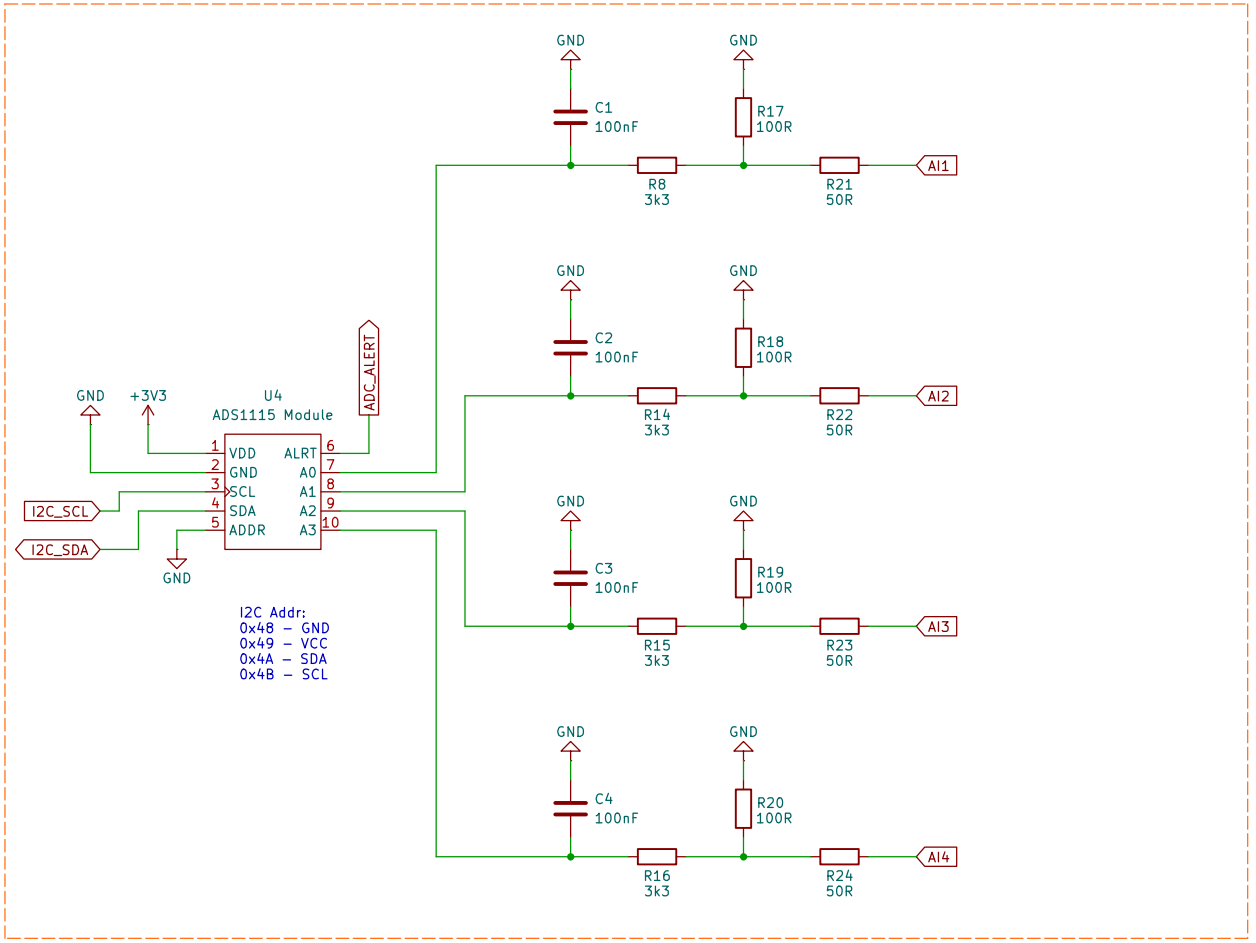
Analog Inputs
Qtd: 4
Typ: 4mA ~ 20mA
Max: 30mA / 5V

ADC 4mA ~ 20mA Module (4x ports)



Analog Inputs (4 x 2mA ~ 20mA)
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Sheet: /Analog Inputs/
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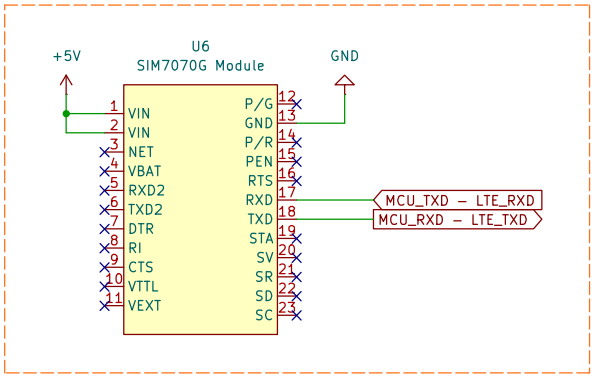
KiCad E.D.A. 8.0.6		Id: 6/7

LTE Module (SIM7070G)
Mode: Half-Duplex
Protection: Thermal Fuse
Noise Reduction: Transient Suppressor Diodes

SIM7070G Module



LTE Module (SIM7070G)
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KiCad E.D.A. 8.0.6		Id: 7/7