Microcontroller

J3
RJ12
6
5
4 Rain
3
2
1

(J9 pin 1 and 6)
GND

+5V
R3
100k
C8
10p
GND

J6
RJ12
6
5 Wind direction
4 Wind speed
3
2
1

(J3 and J6)
GND

+5V   +5V
R2   R4
10k   10k

DE

U2
+9V +5V
1 IO10   IO9 24
2 IO11   IO8 23
3 IO12   IO7 22
4 IO13   IO6 21
                IO5 20
5 ADC0   IO4 19
6 ADC1   IO3 18
7 ADC2   IO2 17
8 ADC3

RX 14 RX
TX 13 TX

10 RESET
15 RESET   SDA 25 SDA
               SCL 26 SCL

16 GND   11 GND

Arduino Pro Mini

J9
ADDRESS
(J9 pin 3, 4, 5 and 6)
1 6
2 5
3 4
GND
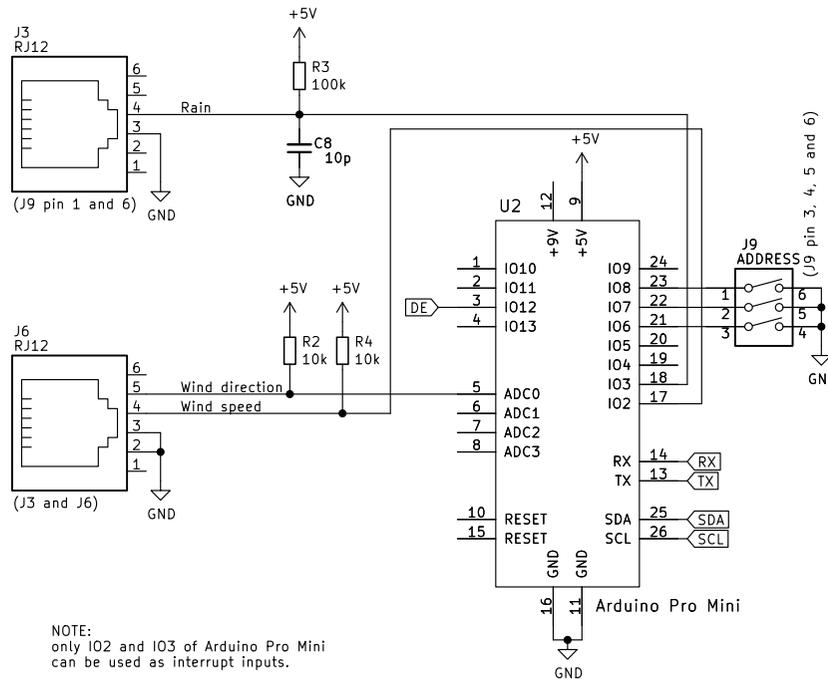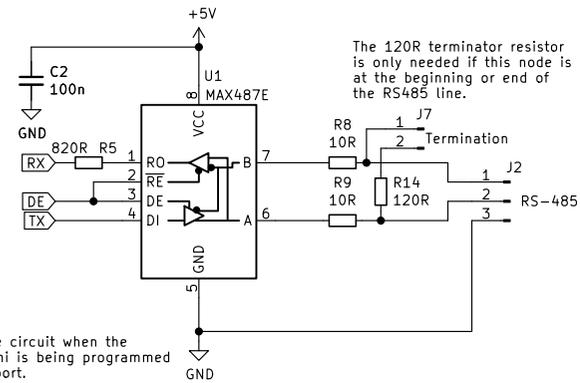
NOTE:
only IO2 and IO3 of Arduino Pro Mini
can be used as interrupt inputs.

Annotations in brackets are the annotations of
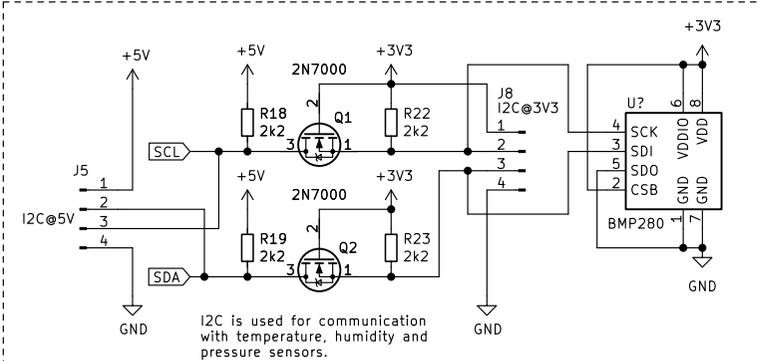the "aprs_measurement_node" pcb.

RS-485 transceiver

+5V
C2
100n
GND

U1
MAX487E
8 VCC
RX 820R R5 1 RO
            2 RE
DE   3 DE
TX   4 DI
      B 7
      A 6
5 GND

The 120R terminator resistor
is only needed if this node is
at the beginning or end of
the RS485 line.

R8
10R   J7
       1
       2 Termination
R9
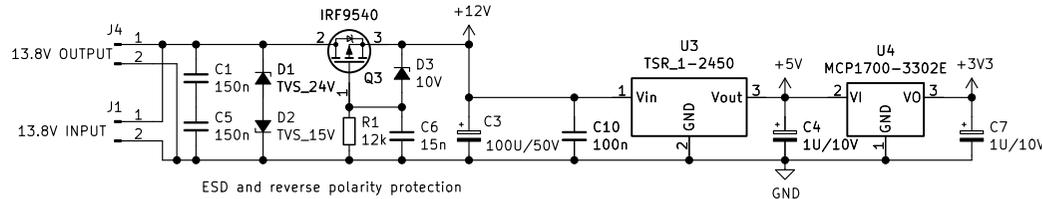10R   R14
       120R
              J2
              1
              2 RS-485
              3

GND

R5 protects the circuit when the
Arduino Pro Mini is being programmed
via the serial port.

I2C level shifter

+5V
J5
1
2
I2C@5V
3
4

SCL

SDA

GND

+5V   +3V3
R18 Q1   R22
2k2 2N7000 2k2

+5V   +3V3
R19 Q2   R23
2k2 2N7000 2k2

GND

J8
I2C@3V3
1
2
3
4

+3V3
U?
4 SCK   VDDIO 6
3 SDI   VDD   8
5 SDO
2 CSB   GND 1
         GND 7
BMP280

GND

I2C is used for communication
with temperature, humidity and
pressure sensors.

Power supply

J4
1
2 13.8V OUTPUT

J1
1
2 13.8V INPUT

C1   D1
150n   TVS_24V

C5   D2
150n   TVS_15V

IRF9540
2
Q3
3
1
R1
12k

+12V
D3
10V
C6
15n

C3
100U/50V

C10
100n

U3
TSR_1-2450
1 Vin Vout 3
2 GND

+5V
C4
1U/10V

U4
MCP1700-3302E
2 VI   VO 3
1 GND

+3V3
C7
1U/10V

GND

ESD and reverse polarity protection

H1 MountingHole
H2 MountingHole
H3 MountingHole
H4 MountingHole

Convert "aprs_measurement_node" pcd:

– Remove RV1, RV2, R3, R6, R7, R10, C11 and C12
– Replace C8 and C9 with jumper
– Change R2 and R4 to 10k
– Place 100k resistor between pin 1 and 2 of J9
– Place 10pF capacitor between pin 2 and 6 of J9
– Place I2C level converter
– Place U4, C4 and C7
– Connect U2 pin 18 to U4 pin 24
– Connect U2 pin 17 to U4 pin 6
– Short U4 pin 2 and U4 pin 3

The ModBus address can be selected by connecting
pin 3, 4 and/or 5 of J9 to pin 6 (ground).

https://meezenest.nl/mees
M.T. Konstapel
Mees Electronics

Sheet: /
File: ds-15901_interface.kicad_sch
Title: DS-15901 weather station interface with RS-485 ModBus
Size: A4 | Date: 2023-12-29 | Rev: A
KiCad E.D.A. kicad 6.0.11 | Id: 1/1

MEES