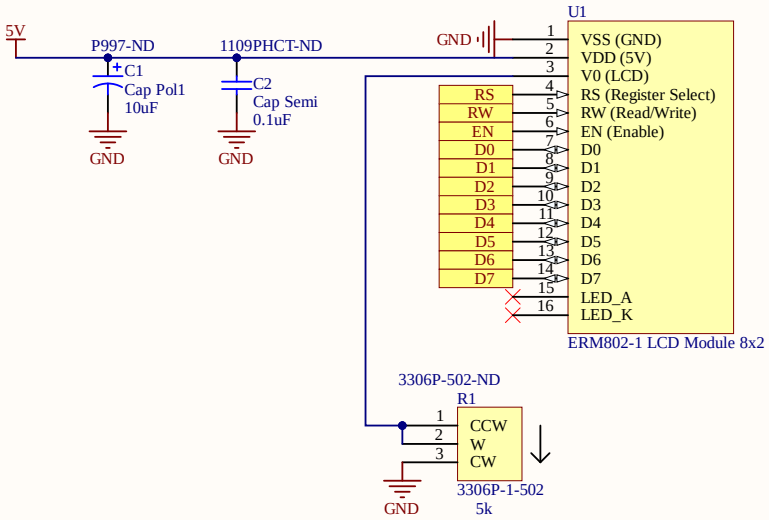
LCD Display



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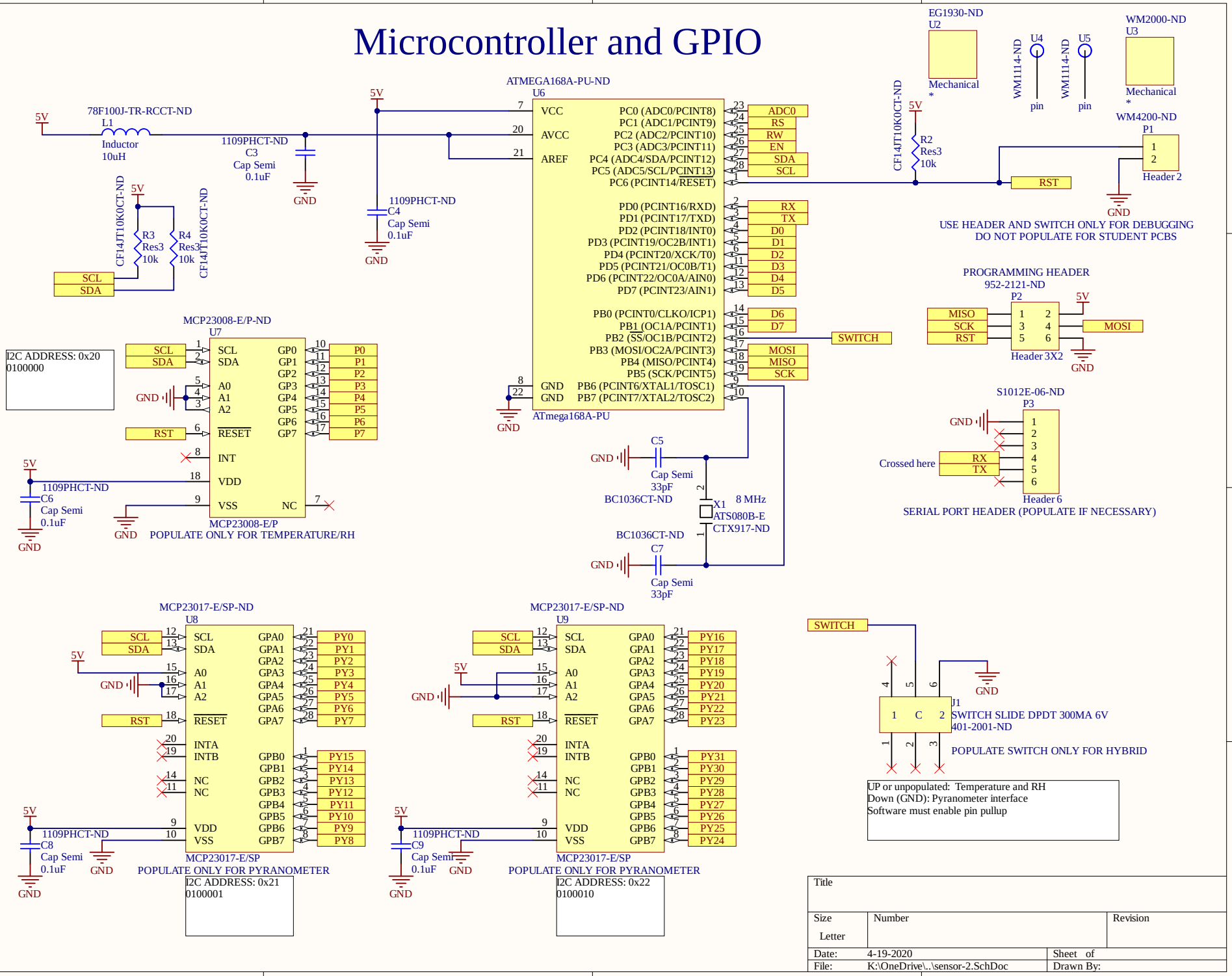
Microcontroller and GPIO



Headers

Temperature and RH
Scaling Byte
Output = Register / Byte
The scaling byte is
1010 binary
10 decimal
0x0A hex

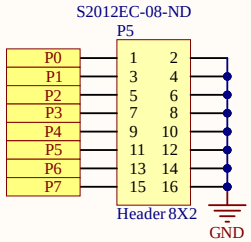
Since the GPIO expander is configured with a weak pullup and closing a jumper will cause a low logic level to occur, the input to the expander is inverted. The input for a proper scaling coefficient is:
11110101 binary
245 decimal
0xF5 hex

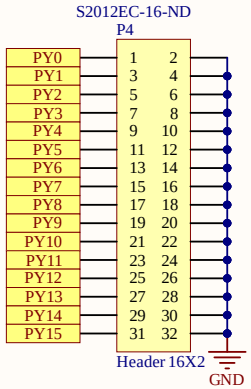
The students only have to encode the scaling byte in binary representation. A binary 1 is represented by a jumper. A binary 0 is represented by an absence of a jumper.

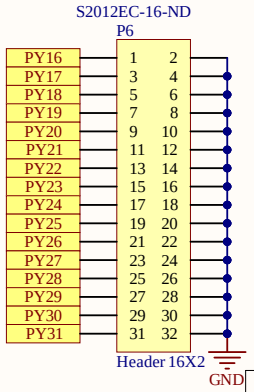
Pyranometer
Scaling Byte
Output = ADC voltage * bytes[4]
The scaling bytes[4] is the binary equivalent of a float (32 bits as 4 bytes)

Since the GPIO expander is configured with a weak pullup and closing a jumper will cause a low logic level to occur, the input to the expander is inverted. The answer is therefore encoded as
number, where the number is given in binary and the number is a binary representation of a float (IEEE 754).

The students only have to encode the float number in binary representation. The float number is a calibration coefficient that will convert voltage to a radiation flux. A binary 1 is represented by a jumper. A binary 0 is represented by an absence of a jumper.







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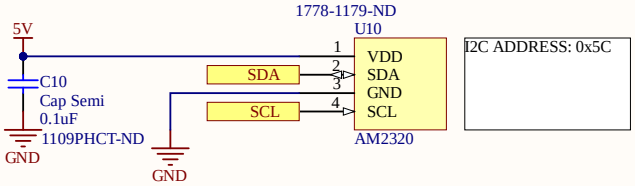
Temperature / RH Sensor



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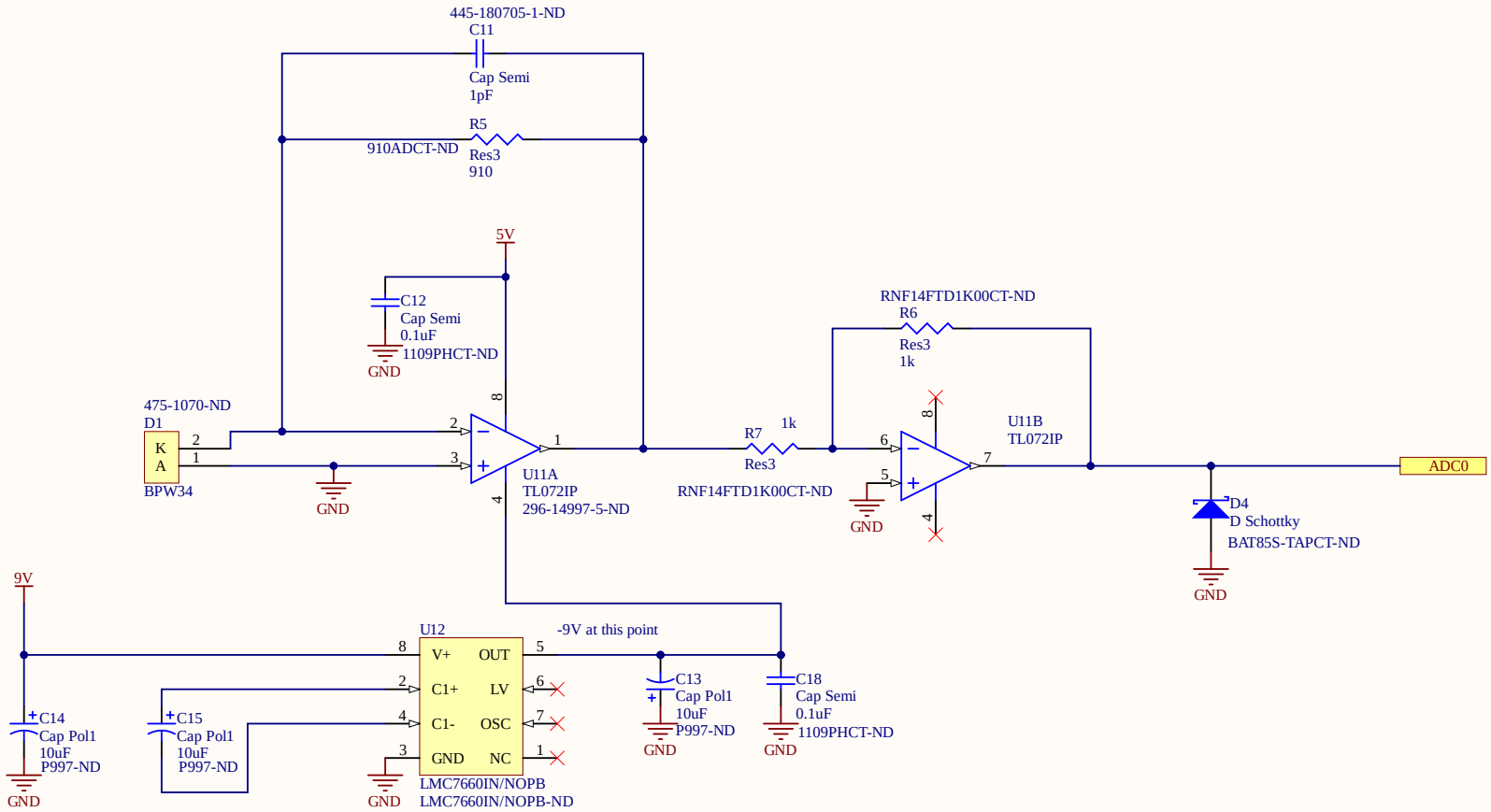
Photodiode and Photovoltaic Mode Amplifier



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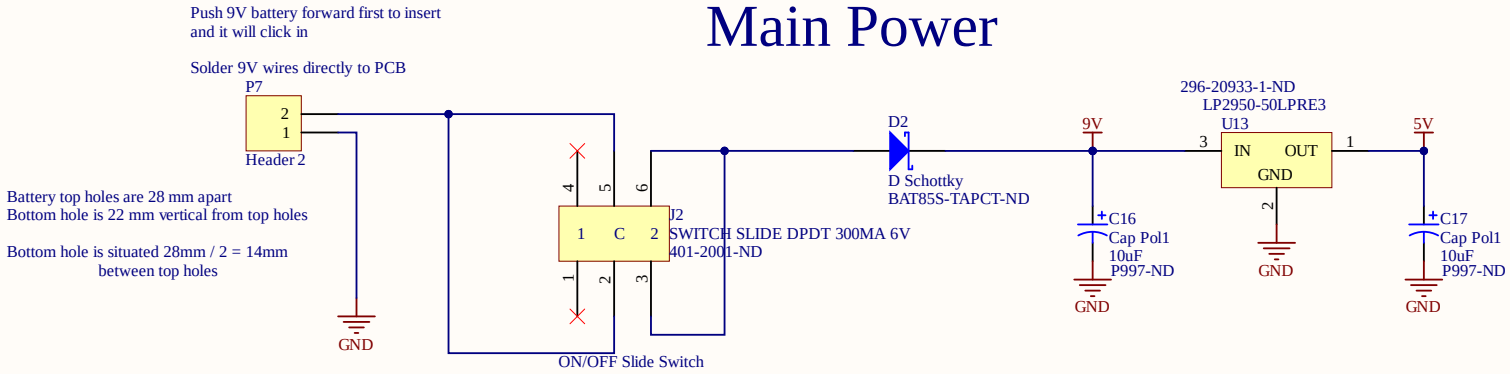
Main Power



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