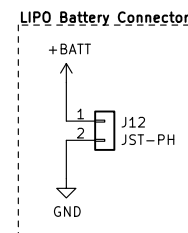
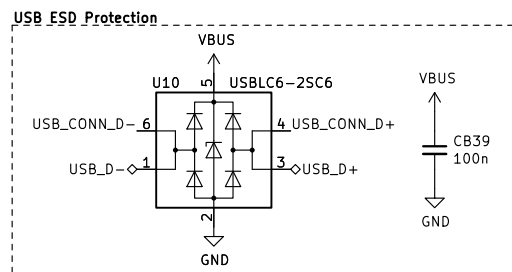
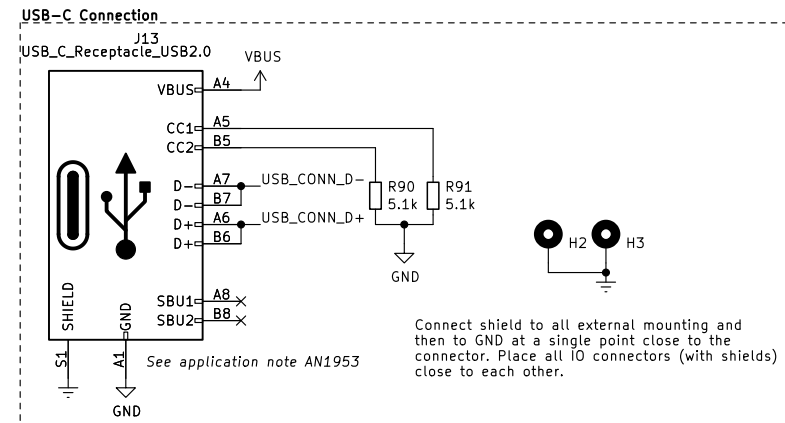
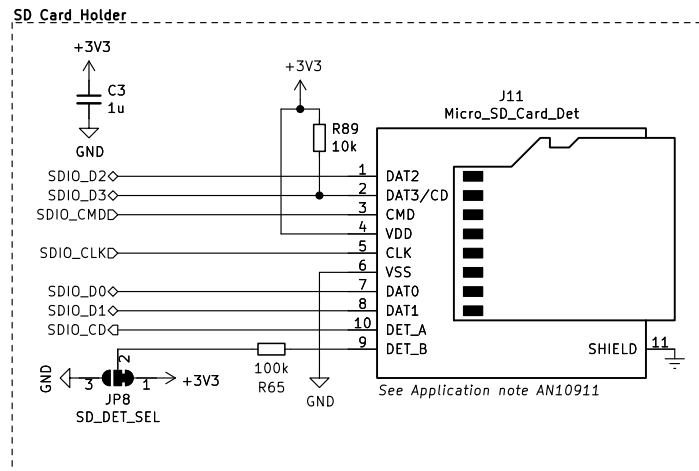


Project: Kleinvoet	
Author: CM Geldenhuys <20198329@sun.ac.za>	
Department of Electronic Engineering – Stellenbosch University	
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File: kleinvoet.kicad_sch	
Title: Kleinvoet	
Size: A4	Date: 2020-06-11
KiCad E.D.A. kicad 6.0.9	Rev: Rev. A
	Id: 1/9



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 Department of Electronic Engineering – Stellenbosch University

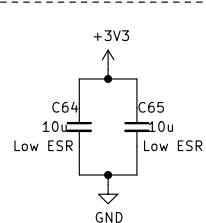
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Title: Kleinvoet

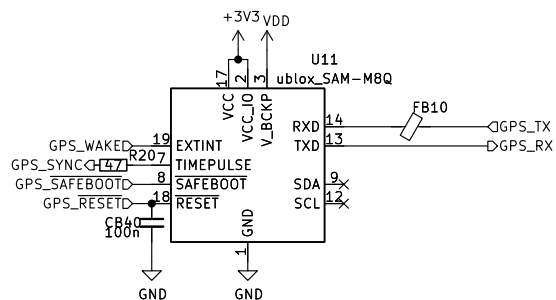
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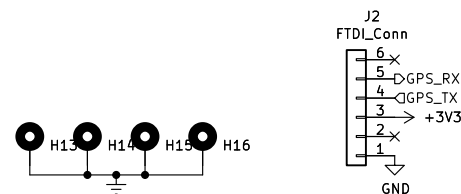
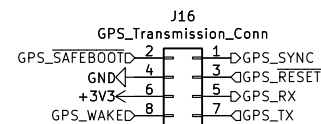
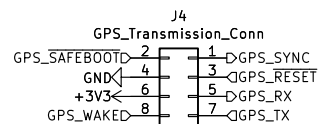
GPS Power



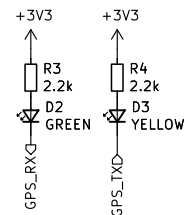
Doesn't require a small bypass cap (100nF). There is bypass cap on the GPS daughter board close to the chip.



See Application Note: SAM-M8Q Hardware Integration



Place all components as close as possible to module. Do NOT drive RESET pin high (this will cause an reset on bootup). Keep a 10mm spacing around module. Do not break GND plane (50x50mm).



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Author: CM Geldenhuys <20198329@sun.ac.za>
Department of Electronic Engineering – Stellenbosch University

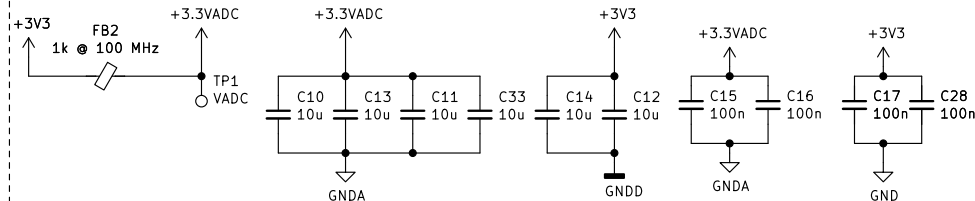
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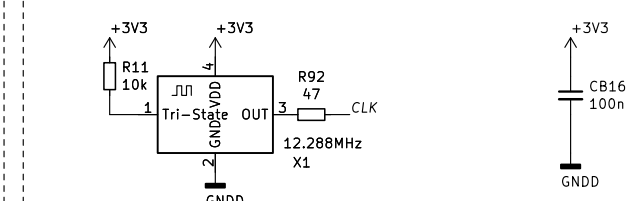
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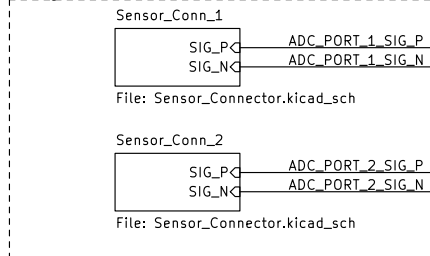
ADC Power



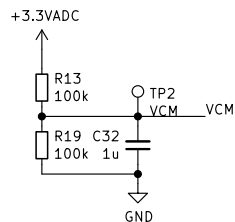
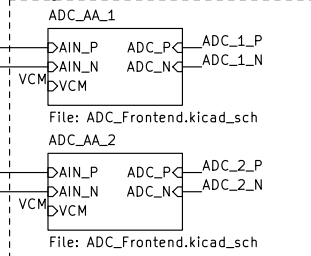
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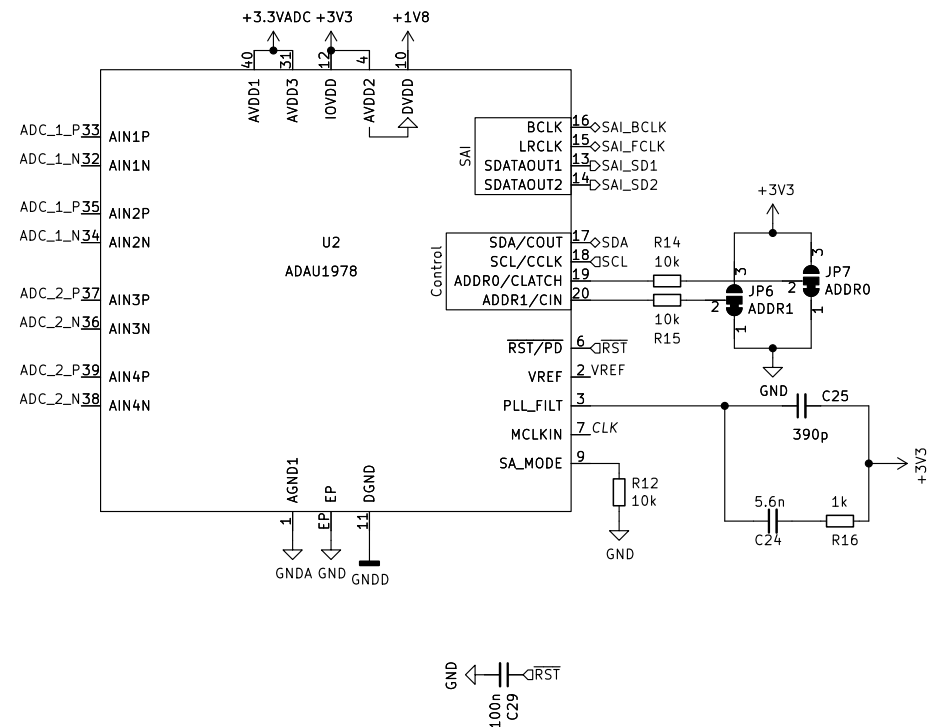
Analogue Sensor Connectors



Analogue Frontend



TP6
BCLK
TP7
FCLK
TP8
SD1
TP9
SD2
TP10
SDA
TP11
SCL



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Department of Electronic Engineering – Stellenbosch University

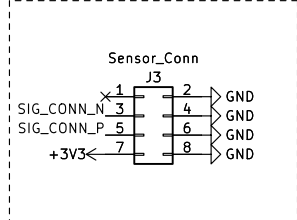
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File: ADC_Interface.kicad_sch

Title: Kleinvoet

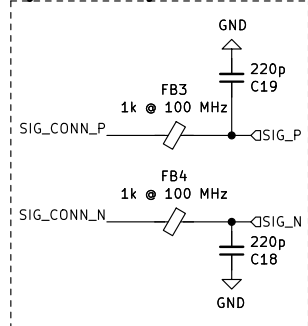
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Date: 2020-06-11
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Sensor_Connector



Signal Conditioning



PIN LAYOUT

1	NC
2	GND
3	SIG_N
4	GND
5	SIG_P
6	GND
7	3V3
8	GND

Any connector could technically be used here. But I prefer using JST connectors because... The JST-GH series seems to be a good fit and allows for the connector to be secured with a locking connector and uses crimp-style connectors allowing for easy wire creation. In the future one might consider moving to a shielded connector but this isn't currently required due to the low EMI noise environment the Kleinvoet will see deployment. The reserved signals currently have no defined feature but could be useful in the future.

The GND lines should be connected to a GND plane at the sensor end. There should be a 10 Ohm resistor placed between the GND plane and GND line. The voltage rail can also be filtered using a FB and bypass capacitors. It is recommended that a reservoir capacitor is placed on the sensor that can handle current spikes on the line.

The connector allows for a differential signal, but if a single ended signal is required tie the SIG_N (Pin 3) to GND at the sensor end. This turns the signal into a single ended/quasi-differential signal.

The sensor is also assumed to use less than 25mA of current. This should be more than enough for most applications.

Project: Kleinvoet

Author: CM Geldenhuys <20198329@sun.ac.za>

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Sheet: /ADC_Interface/Sensor_Conn_1/

File: Sensor_Connector.kicad_sch

Title: Kleinvoet

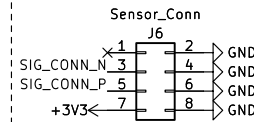
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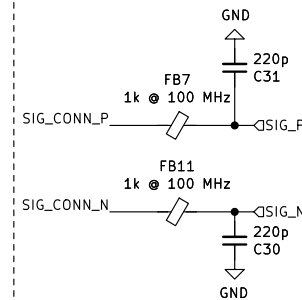
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Sensor_Connector



Signal Conditioning



PIN LAYOUT

1	NC
2	GND
3	SIG_N
4	GND
5	SIG_P
6	GND
7	3V3
8	GND

Any connector could technically be used here. But I prefer using JST connectors because... The JST-GH series seems to be a good fit and allows for the connector to be secured with a locking connector and uses crimp-style connectors allowing for easy wire creation. In the future one might consider moving to a shielded connector but this isn't currently required due to the low EMI noise environment the Kleinvoet will see deployment. The reserved signals currently have no defined feature but could be useful in the future.

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The connector allows for a differential signal, but if a single ended signal is required tie the SIG_N (Pin 3) to GND at the sensor end. This turns the signal into a single ended/quasi-differential signal.

The sensor is also assumed to use less than 25mA of current. This should be more than enough for most applications.

Project: Kleinvoet

Author: CM Geldenhuys <20198329@sun.ac.za>

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Sheet: /ADC_Interface/Sensor_Conn_2/

File: Sensor_Connector.kicad_sch

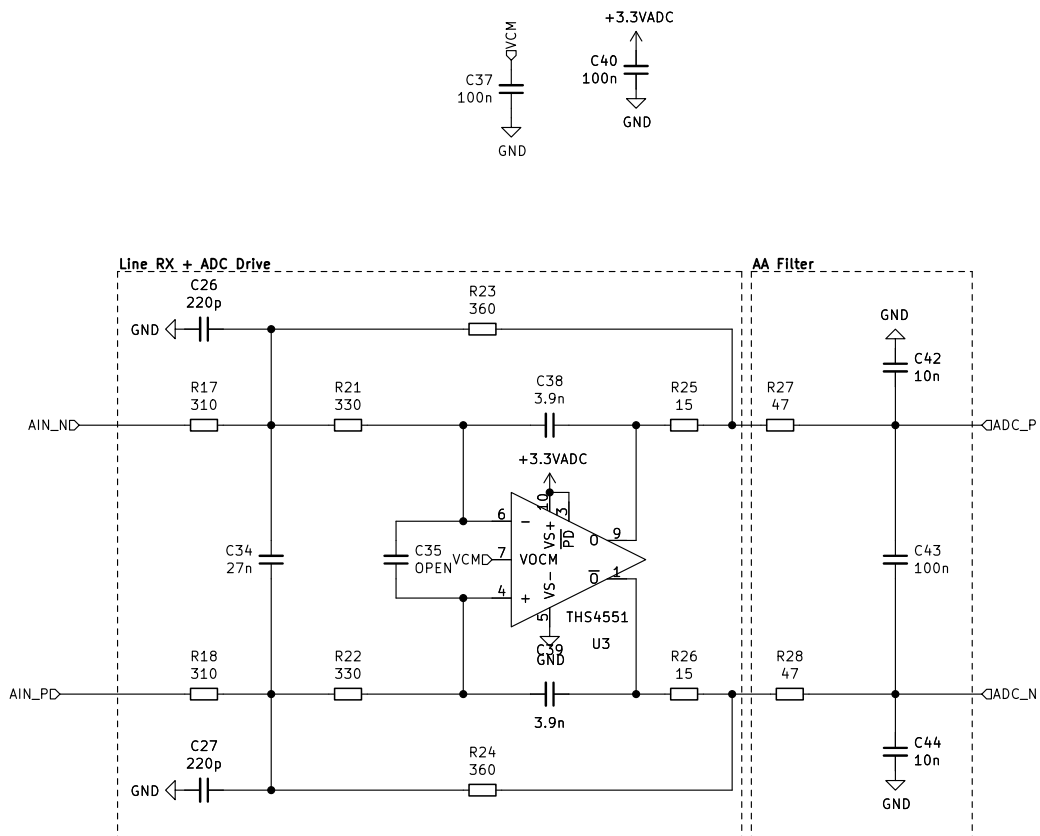
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Size: A4 Date: 2020-06-11

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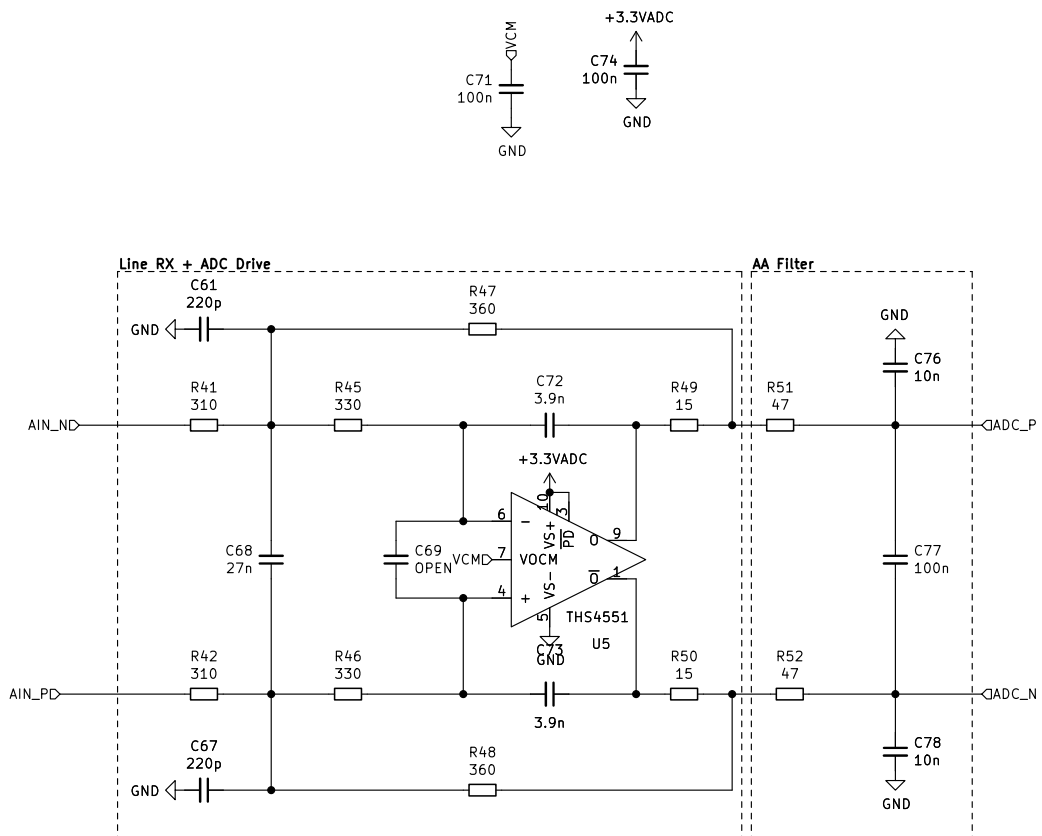


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 Author: CM Geldenhuys <20198329@sun.ac.za>
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 File: ADC_Frontend.kicad_sch

Title: Kleinvoet

Size: A4
 Date: 2020-06-11
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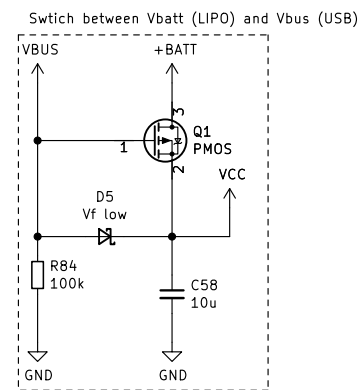
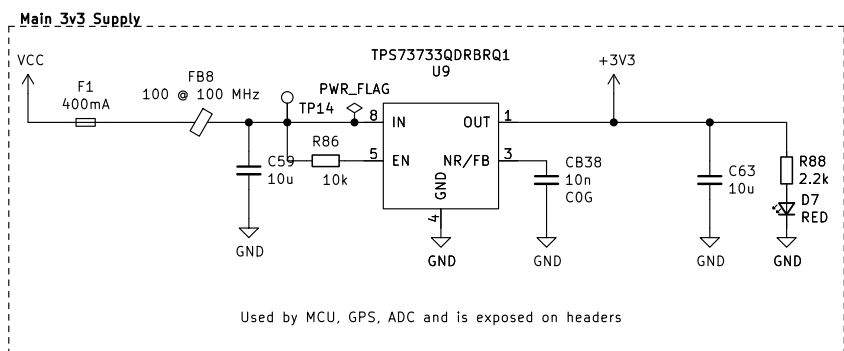
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Department of Electronic Engineering – Stellenbosch University
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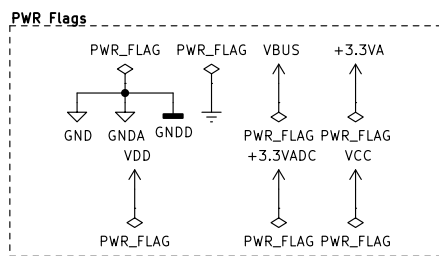
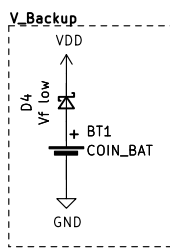
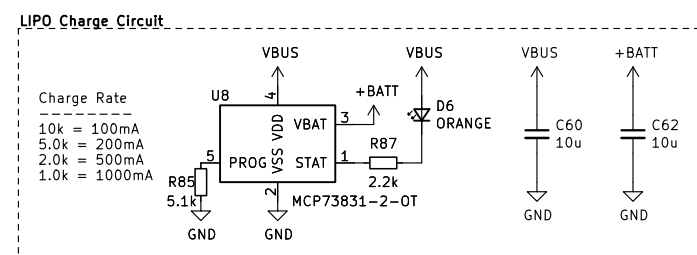
Title: Kleinvoet

Size: A4	Date: 2020-06-11	Rev: Rev. A
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Power Rails

- VBUS – USB bus power (5V) [Max 500mA]
- +BATT – LIPO power (3.6–4.2V) [Max 1A]
- VCC – VBUS (pref.) or +BATT [Max 500mA]
- VDD – GPS backup battery
- +3v3 – Main 3.3V supply [Max 500mA]
- +3.3VADC – 3.3V rail for ADC with filtering [Max 25mA]
- +3.3VA – 3.3V rail for analogue part of MCU [Max 25mA]



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Department of Electronic Engineering – Stellenbosch University	
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File: Power.kicad_sch	
Title: Kleinvoet	
Size: A4	Date: 2020-06-11
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