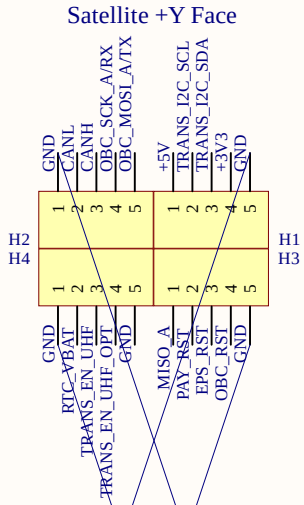
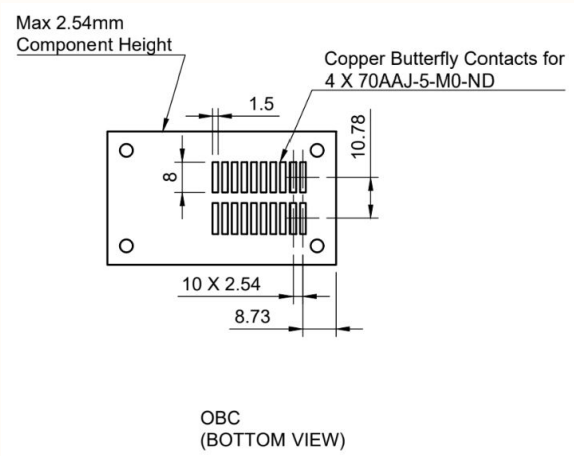
OBC PCB

View looking from the BOTTOM of the satellite UP
Stacked on top of EPS PCB

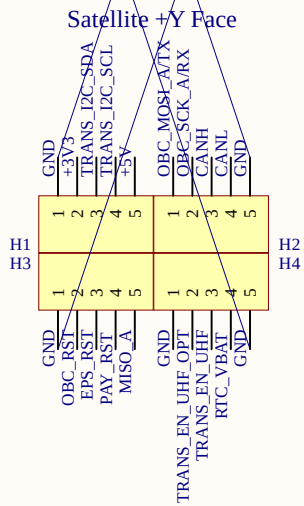


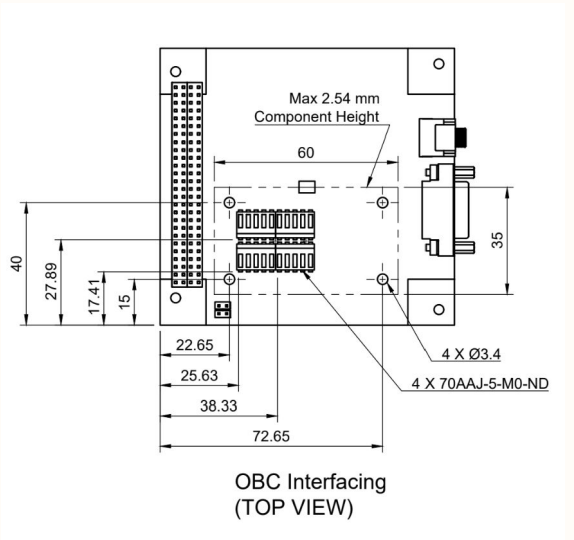


Butterfly Connector (70AAJ-5-M0-ND)
5x1 pins per connector, 2x2 connectors, 10x2 pins total
Note use of the 5-pin variant (4-pin is shown in datasheet)

EPS PCB

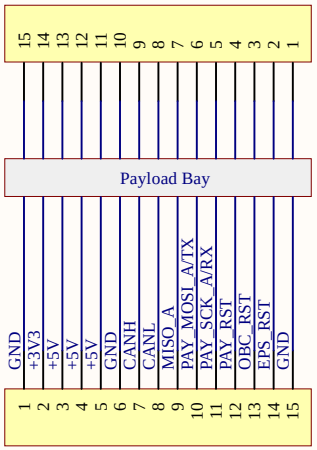
View looking from the TOP of the satellite DOWN





Title: EPS-OBC Interface		
Size: A4	Number: 1	Revision: v0.10.1
Date: 2019-05-16		Sheet 1 of 8
File: C:\Users\..\eps-obc.SchDoc		Drawn By: Bruno Almeida

PAY-SSM PCB



EPS PCB

Hermetic connector (15 pins, Glenair 177-705H or 177-706H)
https://www.datasheets360.com/pdf/2123725778547446062

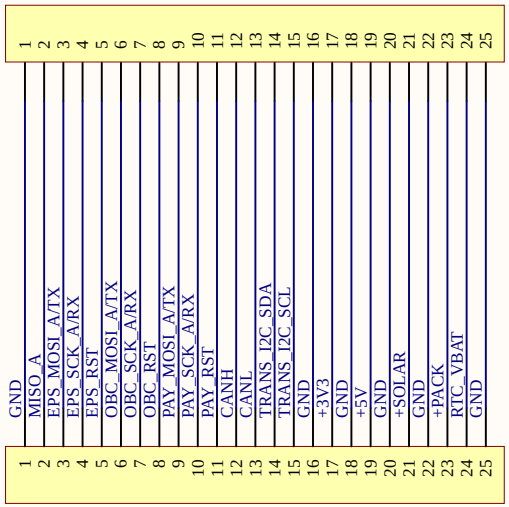
Premade wires (15 pins, 28 AWG)
Similar to https://www.digikey.ca/short/j037h5
Connections not flipped within cable's wires
Needs to be hand-crimped on the payload bay side for the hermic connector

PicoBlade 53261 (15-pin header) from Molex
https://www.digikey.ca/short/j037h7

Title: EPS-PAY Interface		
Size: A4	Number: 2	Revision: v0.10.1
Date: 2019-05-16		Sheet 2 of 8
File: C:\Users\..\eps-pay.SchDoc		Drawn By: Bruno Almeida

Systems PCB

Outside of satellite
Only for testing/debugging



DSUB-25 Connector

Spliced Cable
Connections are flipped within the cable's wires, so the pin numbers match on both ends

EPS PCB

Mini DSUB-25 Connector

Title	EPS-SYS Interface	
Size: A4	Number: 3	Revision: v0.10.1
Date: 2019-05-16		Sheet 3 of 8
File: C:\Users\..\eps-sys.SchDoc		Drawn By: Bruno Almeida

Transceiver stacked on top of
EPS PCB using header pins

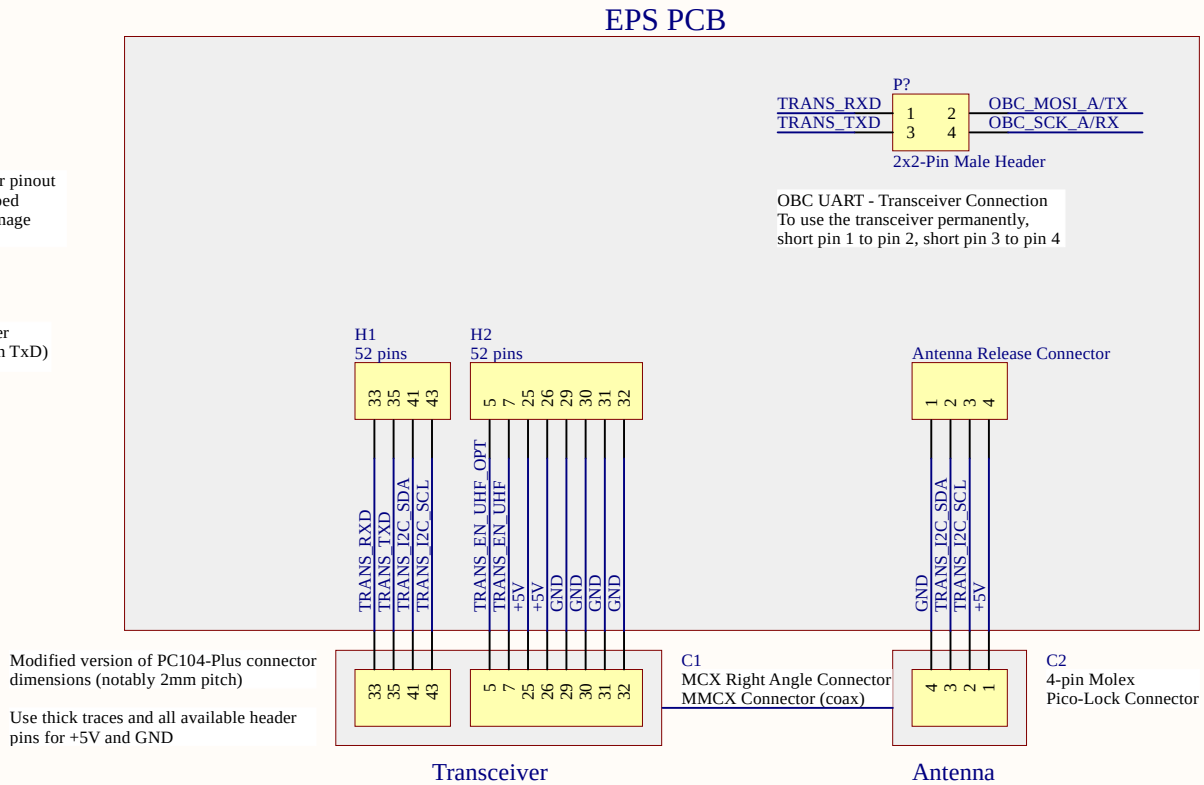
Transceiver customized to use +5V supply,
not +3.3V

Comms signals routed from OBC
through EPS board

WARNING: In UHF Manual and Protocol Rev. 2, the connector pinout diagram on p. 11, for each of H1 and H2, rows 1 and 2 are flipped i.e. H1 and H2 are placed correctly, but the bottom left in the image should be H1, pin 1, and the top left should be H2, pin 2

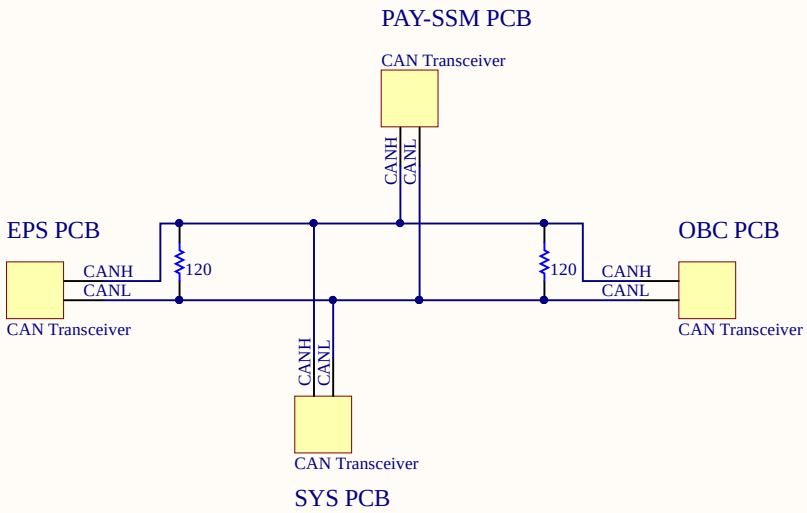
Header layout based on UHF_UTAT_Conn_Pinout.pdf
(add En UHF Opt. and En UHF just in case)

RxD and TxD are the UART lines with respect to the transceiver
(i.e. transceiver receives UART on RxD and transmits UART on TxD)

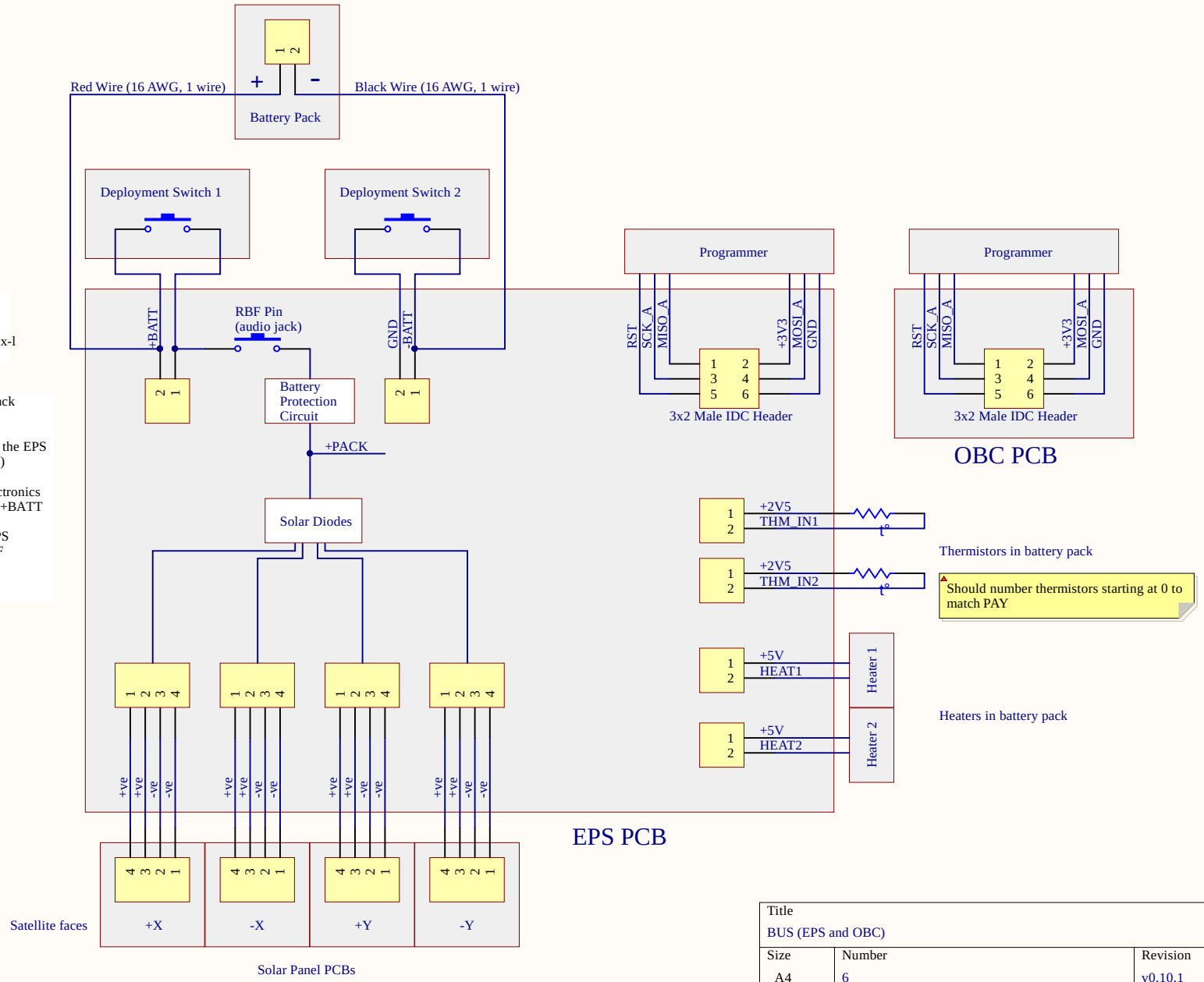


Title: Communications		
Size: A4	Number: 4	Revision: v0.10.1
Date: 2019-05-16		Sheet 4 of 8
File: C:\Users\..\com.SchDoc		Drawn By: Bruno Almeida

OBC and EPS are on the "ends" of the bus, so they have the 120 ohm terminations
PAY and SYS are in the "middle" of the bus, so no resistor terminations



Title: CAN Bus		
Size: A4	Number: 5	Revision: v0.10.1
Date: 2019-05-16		Sheet 5 of 8
File: C:\Users\..\can.SchDoc		Drawn By: Bruno Almeida



2-pos battery connector
Molex 39-30-1020
Right-angled header
https://www.digikey.ca/product-detail/en/molex-llc/0039301020/WM1351-ND/561078

+BATT is the raw voltage across the battery pack (ignoring connection to EPS)

+PACK is the voltage from the battery pack to the EPS board (after deployment switches and RBF pin)

If the battery pack is connected to the EPS electronics (i.e. DS1, DS2, RBF all connected), +PACK = +BATT

If the battery pack is disconnected from the EPS electronics (i.e. one or more of DS1, DS2, RBF disconnected), +PACK = 0

+BATT = 4.2V

Title: BUS (EPS and OBC)		
Size: A4	Number: 6	Revision: v0.10.1
Date: 2019-05-16		Sheet 6 of 8
File: C:\Users\..\bus.SchDoc		Drawn By: Bruno Almeida

Start thermistor numbering from 0
to match ADC channel numbering

Thermistors (in microfluidics chips)

Thermistors 0-4 Thermistors 5-9

PAY-Optical PCB

(stacked on top of PAY-SSM)

2 1 4 3 6 5 8 7 10 9 12 11 14 13 16 15 18 17 20 19

GND +3V3 MISO_IN SD4 MOSI_IN SD3 SCK_IN SD2 MUX_5_EN SD1 SENS_DAC_CS SYNC04 SENS_ADC_CS SYNC03 ADC_SYNC SYNC02 CLKIN SYNC01 +3V3 GND

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Male Female

10x2 Header (Stacked)
1.27mm pitch

+2V5 CH0 +2V5 CH1 +2V5 CH2 +2V5 CH3 +2V5 CH4

1 2 3 4 5 6 7 8 9 10

+2V5 CH5 +2V5 CH6 +2V5 CH7 +2V5 CH8 +2V5 CH9

1 2 3 4 5 6 7 8 9 10

Programmer

RST SCK_A MISO_A +3V3 MOSI_A GND

1 2 3 4 5 6

3x2 Male IDC Header

PAY-LED PCB (x2)

10 9 8 7 6 5 4 3 2 1

+3V3 GND PEX_RST LED_CLK PEX_CS SCK_A MOSI_A MISO_A GND +3V3

1 2 3 4 5 6 7 8 9 10

Female Female

DF14 Connector

PAY-SSM PCB

HEAT1 +5V 2 1 HEAT2 +5V 2 1 HEAT3 +5V 2 1 HEAT4 +5V 2 1 HEAT5 +5V 2 1

Heater 1 Heater 2 Heater 3 Heater 4 Heater 5

2-pin connector:
https://www.molex.com/pdm_docs/sd/151340203_sd.pdf

POS_PHT1 +3V3 2 1 POS_PHT2 +3V3 2 1 GND POS_LED1 2 1 GND POS_LED2 2 1

Sensor 1 Sensor 2 LED 1 LED 2

Positioning - Photodiode Setup

1 2 3 4

Bridge A Out 1 Bridge A Out 2 Bridge B Out 1 Bridge B Out 2

Motor 1

1 2 3 4

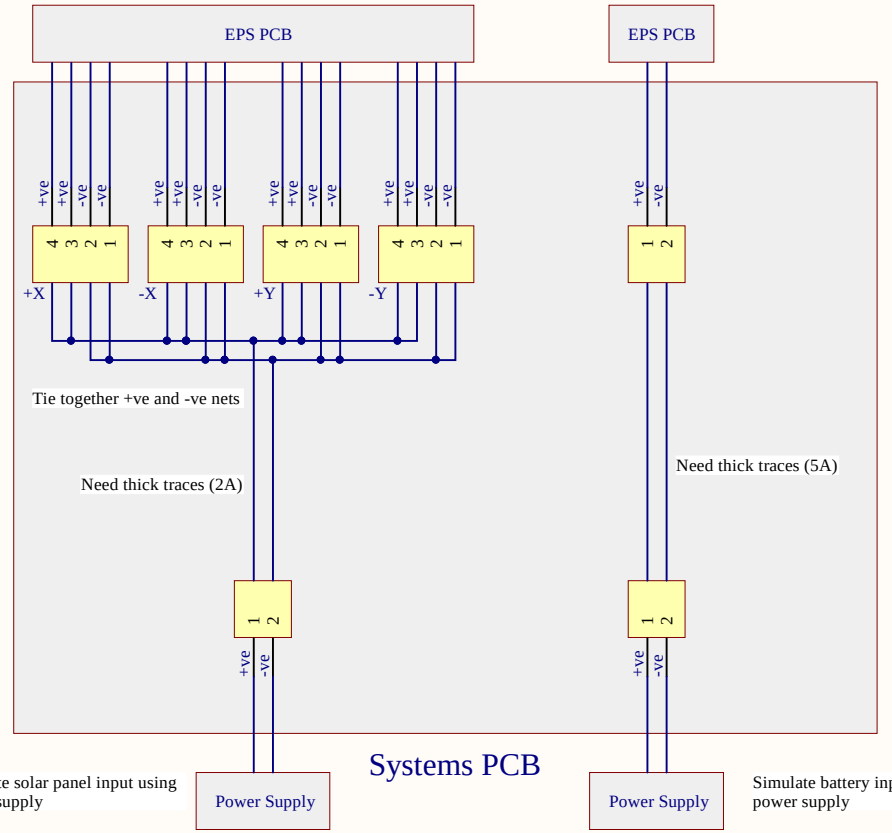
Bridge A Out 1 Bridge A Out 2 Bridge B Out 1 Bridge B Out 2

Motor 2

Actuation Plate Setup

Title: Payload		
Size: A4	Number: 7	Revision: v0.10.1
Date: 2019-05-16		Sheet 7 of 8
File: C:\Users\..\pay.SchDoc		Drawn By: Bruno Almeida

Molex PicoBlade connector: WM7622CT-ND
https://www.digikey.com/product-detail/en/molex-llc/0532610471/WM7622CT-ND/699109



Molex battery connector: WM1351-ND
https://www.digikey.ca/product-detail/en/molex-llc/0039301020/WM1351-ND/561078

Screw terminal connector: 732-2028-ND
https://www.digikey.ca/product-detail/en/wurth-electronics-inc/691102710002/732-2028-ND/2060524

Screw terminal connector: 732-2028-ND
https://www.digikey.ca/product-detail/en/wurth-electronics-inc/691102710002/732-2028-ND/2060524

Simulate solar panel input using power supply

Power Supply

Power Supply

Simulate battery input using power supply

Title: Systems (Debugging)		
Size: A4	Number: 8	Revision: v0.10.1
Date: 2019-05-16		Sheet 8 of 8
File: C:\Users\..\sys.SchDoc		Drawn By: Bruno Almeida