ADC Board Schematic

U7 MCP120-xxxxTT

C1 0.1uF

C47 2.2uF **C48** 2.2uF

NRST

VCAP1 PWR_FLAG
VCAP2
VREF+

BOOT0 138
PWR_FLAG

R30 10k **J10** BootJumper BOOT0

+3.3V

H1 H2 H3 H4 Mounting Hole Pad

GNDD

U0 STM32H743IIx

+3.3V   +3.3VA

Pin	Net
25	NRST
143	PDR_ON
138	BOOT0
71	VCAP1
106	VCAP2
32	VREF+

VBAT 6, VDD 17, 30, 39, 52, 62, 72, 84, 108, 121, 144, 131, 95
VDD33_USB 33, VDDA

PA0 34 Sen10
PA1 35 Sen11
PA2 36 Sen12
PA3 37 Sen9
PA4 40 Sen8
PA5 41 Sen7
PA6 42 Sen6
PA7 43 Sen5
PA8 100 TP26 TestPoint_Small
PA9 101 VBUS_SENSE
PA10 102 TP27 TestPoint_Small
PA11 103 USB_OTG_FS_D-
PA12 104 USB_OTG_FS_D+
PA13 105 JTMS
PA14 109 JTCK
PA15 110 JTDI

PB0 46 Sen2
PB1 47 Sen1
PB2 48
PB3 133 JTDO
PB4 134 JNTRST
PB5 135
PB6 136
PB7 137
PB8 139
PB9 140
PB10 69 USART3_TX
PB11 70 USART3_RX
PB12 73
PB13 74
PB14 75 USART1_TX
PB15 76 USART1_RX

PC0 26 Sen14
PC1 27 Sen13
PC2_C 28
PC3_C 29
PC4 44 Sen4
PC5 45 Sen3
PC6 96
PC7 97
PC8 98 TP28 TestPoint_Small
PC9 99 TP29 TestPoint_Small
PC10 111 LED4
PC11 112 LED3
PC12 113
PC13 7
PC14 8
PC15 9

PD0 114
PD1 115
PD2 116
PD3 117
PD4 118
PD5 119 USART2_TX
PD6 122 USART2_RX
PD7 123
PD8 77
PD9 78
PD10 79
PD11 80
PD12 81
PD13 82
PD14 85
PD15 86

PE0 141 LED2
PE1 142 LED1
PE2 1
PE3 2
PE4 3
PE5 4
PE6 5
PE7 58
PE8 59
PE9 60
PE10 63
PE11 64
PE12 65
PE13 66
PE14 67
PE15 68

PF0 10
PF1 11
PF2 12
PF3 13 Sen22
PF4 14 Sen21
PF5 15 Sen20
PF6 18 Sen19
PF7 19 Sen18
PF8 20 Sen17
PF9 21 Sen16
PF10 22 Sen15
PF11 49
PF12 50
PF13 53
PF14 54
PF15 55

PG0 56
PG1 57
PG2 87
PG3 88
PG4 89
PG5 90
PG6 91
PG7 92 TP24 TestPoint_Small
PG8 93 TP25 TestPoint_Small
PG9 124
PG10 125
PG11 126
PG12 127
PG13 128
PG14 129
PG15 132

PH0 23
PH1 24

VSS 16, 38, 51, 61, 83, 94, 107, 120, 130
VSSA 31

GNDD   GNDA

Sheet: Analog Input File: Analog Input.sch

Sen1D, Sen2D, Sen3D, Sen4D, Sen5D, Sen6D, Sen7D, Sen8D, Sen9D, Sen10D, Sen11D, Sen12D, Sen13D, Sen14D, Sen15D, Sen16D, Sen17D, Sen18D, Sen19D, Sen20D, Sen21D, Sen22D

VREF+

Sen1 – Sen22

J7 AltPowerInput +5V GNDD

+3.3V
C33 4.7uF DC6, C34 DC17, C35 DC30, C36 DC39, C37 DC52, C38 DC62, C39 DC72, C40 DC84, C41 DC106, C42 DC121, C43 DC151, C44 DC141, C45 DC95, C46 DC33, C32 DC33
+3.3VA
GNDD   GNDA

+3.3V
LED4
LED3
LED2
LED1

D5 LED   D1 LED   D2 LED   D3 LED   D4 LED
R25 CL   R55 CL   R56 CL   R57 CL   R58 CL
GNDD

USB_VBUS
R23 2200
VBUS_SENSE
when power is off, PA9 can't exceed 4V.
this brings a 5.25V VBUS down to 3.47V.
R24 4300
GNDD

J9 USART2 USART2_RX USART2_TX GNDD
J3 USART3 USART3_RX USART3_TX GNDD
J4 USART1 USART1_RX USART1_TX GNDD

Sheet: RS485 File: RS485.sch
USART3_RX UART_RX
USART3_TX UART_TX

We feed 3.3V back to the programmer so they
know what voltage we run at, and whether or
not we're live.
+3.3V

J2 ST-LINK/V2
JNTRST 1 2
JTDI 5 3 4
JTMS 7 5 6 VBUS
JTCK 9 7 8
11 9 10
13 11 12
15 13 14
17 15 16
19 17 18
19 20
JTDO
NRST
GNDD

J5 UE27AC5410H
VBUS 1
D+ 3
D- 2
Shield GND 5
GNDD

USB_D+
USB_OTG_FS_D+
USB_D-
USB_OTG_FS_D-
U9 USBLC6-2SC6
GNDD

FB1 MPZ2012S601AT000
+5V **J8** USBPowerJumper USB_VBUS

J11 USB Header

Monolithic switching regulator ~5V->3.3V
+5V **U13** 3.3V Reg +3.3V
IN OUT
GND
C55 DC   **C5** 10uF ECA-GA1V106   **C56** DC   **C54** 22uF ECE-A1HKA220
GNDD

JP0 PWR_FLAG SolderJumper_2_Bridged
Represents single connection between GNDD and GNDA
near the 5V regulator. Could be cut and choke inserted.
GNDD   GNDA

Reference STMicroelectronics Application Note AN4938
for details on basic STMH74x circuits

+5V

Note that ethernet cables don't flip pins.
Main board MUST connect different pins to the receptacle.

U14
ISL83490

+3.3V

R61
120

A

C60   UART_RX
DC   UART_TX

1	VCC	A	8
2	RO	B	7
3	DI	Z	6
4	GND	Y	5

GNDD

B

Z

Y

PWR_FLAG
PWR_FLAG

8
7
6
5
4
3
2
1

J6
54601−908WPLF

GNDD

Title:

Size: A4	Date:	Rev:
KiCad E.D.A. kicad (5.1.7)−1		Id: 2/3

The resistors here set the gain of the transimpedance amplifiers.
They should be (max expected current) * R = VREF+

+3.3VA

U6C
Opamp_Quad_Generic
GNDA

U6D
Opamp_Quad_Generic
GNDA

+3.3VA

U1E
Opamp_Quad_Generic
U2E
Opamp_Quad_Generic
U3E
Opamp_Quad_Generic
U4E
Opamp_Quad_Generic
U5E
Opamp_Quad_Generic
U6E
Opamp_Quad_Generic

GNDA

VREF+

+3.3VA

J1
BHR-44-HUA

44	43	Sen22R
42	41	Sen21R
40	39	Sen20R
38	37	Sen19R
36	35	Sen18R
34	33	Sen17R
32	31	Sen16R
30	29	Sen15R
28	27	Sen14R
26	25	Sen13R
24	23	Sen12R
22	21	Sen11R
20	19	Sen10R
18	17	Sen9R
16	15	Sen8R
14	13	Sen7R
12	11	Sen6R
10	9	Sen5R
8	7	Sen4R
6	5	Sen3R
4	3	Sen2R
2	1	Sen1R

C26 1uF

C27 1uF

GNDA

+5V   U29   AP2114HA-3.3TRG1   +3.3VA
VI   GND   VO
C29 4.7uF   C28 4.7uF
GNDA

+3.3VA   U10   MIC5366-2.0YC5
VIN   VOUT   VREF+
C2 2.2uF   EN   GND   C3 2.2uF
GNDA

U1B Opamp_Quad_Generic   VREF+ 5   Sen1R 6   7   TestPoint TP1 Sen1   1800 R1
U1A Opamp_Quad_Generic   VREF+ 3   Sen2R 2   1   TestPoint TP2 Sen2   1800 R2
U1D Opamp_Quad_Generic   VREF+ 12   Sen3R 13   14   TestPoint TP3 Sen3   1800 R3
U1C Opamp_Quad_Generic   VREF+ 10   Sen4R 9   8   TestPoint TP4 Sen4   1800 R4

U2B Opamp_Quad_Generic   VREF+ 5   Sen5R 6   7   TestPoint TP5 Sen5   1800 R5
U2A Opamp_Quad_Generic   VREF+ 3   Sen6R 2   1   TestPoint TP6 Sen6   1800 R6
U2D Opamp_Quad_Generic   VREF+ 12   Sen7R 13   14   TestPoint TP7 Sen7   1800 R7
U2C Opamp_Quad_Generic   VREF+ 10   Sen8R 9   8   TestPoint TP8 Sen8   1800 R8

U3B Opamp_Quad_Generic   VREF+ 5   Sen9R 6   7   TestPoint TP9 Sen9   1800 R9
U3A Opamp_Quad_Generic   VREF+ 3   Sen10R 2   1   TestPoint TP10 Sen10 1800 R10
U3D Opamp_Quad_Generic   VREF+ 12   Sen11R 13 14   TestPoint TP11 Sen11 1800 R11
U3C Opamp_Quad_Generic   VREF+ 10   Sen12R 9   8   TestPoint TP12 Sen12 1800 R12

U4B Opamp_Quad_Generic   VREF+ 5   Sen13R 6   7   TestPoint TP13 Sen13 1800 R13
U4A Opamp_Quad_Generic   VREF+ 3   Sen14R 2   1   TestPoint TP14 Sen14 1800 R14
U4D Opamp_Quad_Generic   VREF+ 12   Sen15R 13 14   TestPoint TP15 Sen15 1800 R15
U4C Opamp_Quad_Generic   VREF+ 10   Sen16R 9   8   TestPoint TP16 Sen16 1800 R16

U5B Opamp_Quad_Generic   VREF+ 5   Sen17R 6   7   TestPoint TP17 Sen17 1800 R17
U5A Opamp_Quad_Generic   VREF+ 3   Sen18R 2   1   TestPoint TP18 Sen18 1800 R18
U5D Opamp_Quad_Generic   VREF+ 12   Sen19R 13 14   TestPoint TP19 Sen19 1800 R19
U5C Opamp_Quad_Generic   VREF+ 10   Sen20R 9   8   TestPoint TP20 Sen20 1800 R20

U6B Opamp_Quad_Generic   VREF+ 5   Sen21R 6   7   TestPoint TP21 Sen21 1800 R21
U6A Opamp_Quad_Generic   VREF+ 3   Sen22R 2   1   TestPoint TP22 Sen22 1800 R22