PIn_Config_NUCLEO Arduino Layout						
Connector	Pin	Pin Name	STM32 Pin	Function	Moule	Configeration
CN6 Power	1	NC	-	-	-	-
	2	IOREF	-	3.3V Ref	ADC_Pin 6	3.3V Ref
	3	RESET	NRST	RESET	-	-
	4	+3.3V	-	3.3V input/output	ADC_Pin5, DAC_Pin10, Digital_in_Pin2, Digital_Out_Pin2,	3.3V
	5	+5V	-	5V output	-	-
	6	GND	-	Ground	Digital_IN_Pin_1,2,4,5,6,8	GND
	7	GND	-	Ground	-	-
	8	VIN	-	Power input	-	-
CN8 Analog	1	A0	PA0	ADC12_IN5	-	-
	2	A1	PA1	ADC12_IN6	-	-
	3	A2	PA4	ADC12_IN9	-	-
	4	A3	PB0	ADC12_IN15	-	-
	5	A4	PC1 or PB9(1)	ADC123_IN2 (PC1) or I2C1_SDA (PB9)	-	-
	6	A5	PC0 or PB8(1)	ADC123_IN1 (PC0) or I2C1_SCL (PB8)	-	-
CN5 Digital	10	D15	PB8	I2C1_SCL	-	-
	9	D14	PB9	I2C1_SDA	-	-
	8	AREF	-	AVDD	-	-
	7	GND	-	Ground	DC_Header_Pin 1 ,3,11,1	GND
	6	D13	PA5	SPI1_SCK	ADC_Header_Pin 2	SPI1_SCK
	5	D12	PA6	SPI1_MISO	ADC_Header_Pin 9	SPI1_MISO
	4	D11	PA7	TIM17_CH1 or SPI1_MOSI	ADC_Header_Pin 4	SPI1_MOSI
	3	D10	PB6	TIM4_CH1 or SPI1_CS	-	-
CN5 Digital	2	D9	PC7	TIM3_CH2	-	-
	1	D8	PA9	-	Digital_Out_Pin_4	GPIO_Output (Latch)
CN9 Digital	8	D7	PA8	-	n_5, Digital_Out_Pin_7, D	CLK
	7	D6	PB10	TIM2_CH3	-	-
	6	D5	PB4	TIM3_CH1	-	-
	5	D4	PB5	-	-	-
	4	D3	PB3	TIM2_CH2	-	-
	3	D2	PA10	-	Digital_IN_Pin_4	GPIO_Output (Data_In)
	2	D1	PA2	USART2_TX	-	-
	1	D0	PA3	USART2_RX	-	-

PIn_Config_NUCLEO Morpho Layout			
Pin Number	Name	Moule	Configeration
CN7 Odd Pins	-	-	-
1	PC10	-	-
3	PC12	-	-
5	VDD	-	-
7	BOOT0	-	-
9	-	-	-
11	-	-	-

13	PA13	-	-
15	PA14	-	-
17	PA15	-	-
19	GND	-	-
21	PB7	-	-
23	PC13	-	-
25	PC14	ADC_Header_Pin 7	GPIO_Output (Chip Select)
27	PC15	ADC_Header_Pin 8	GPIO_Output (Chip Select)
29	PH0	-	-
31	PH1	-	-
33	VBAT	-	-
35	PC2	-	-
CN7 Even Pins	-	-	-
2	PC11	-	-
4	PD2	-	-
6	E5V	-	-
8	GND	-	-
10	-	-	-
12	IOREF	-	-
14	RESET	-	-
16	+3.3V	-	-
18	+5V	-	-
20	GND	-	-
22	GND	-	-
24	VIN	-	-
26	-	-	-
28	PA0	-	-
30	PA1	-	-
32	PA4	-	-
34	PB0	-	-
36	PC1 or PB9	-	-
CN10 Odd Pins	-	-	-
1	PC9	-	-
3	PB8	-	-
5	PB9	-	-
7	AVDD	TBD	-
9	GND	DAC_Header, 1,2,3,7,11,12	GND
11	PA5	-	-
13	PA6	-	-
15	PA7	-	-
17	PB6	-	-
19	PC7	-	-
21	PA9	Digital_Out_Pin_4	GPIO_Output (Latch)
23	PA8	Digital_Out_Pin_7	GPIO_CLK

25	PB10	DAC_Header_Pin_9	SPI2_SCK
27	PB4	DAC_Header_Pin_6	GPIO_Output (Latch)
29	PB5	DAC_Header_Pin_4	TBD
31	PB3	DAC_Header_Pin_5	TBD
33	PA10	Digital_IN_Pin_4	GPIO_Output (Data_In)
CN10 Even Pins	-	-	-
2	PC8	-	-
4	PC6	-	-
6	PC5	-	-
8	U5V	-	-
10	-	-	-
12	PA12	-	-
14	PA11	-	-
16	PB12	DAC_Header_Pin_8	SPI2_MISO
18	PB11	-	-
20	GND	Digital_Out_Pin_1,3,6,8	GND
22	PB2	Digital_Out_Pin_5	GPIO_Output (Data Set)
24	PB1	-	-
26	PB15	-	-
28	PB14	-	-
30	PB13	-	-
32	AGND	-	-
34	PC4	-	-

DAC_And_CS_Header					
DAC_Header_1*12	**Description**	**74HC595 Pin**	**MCP4822**	**Nucleo Pin _ SPI_2**	**Pin Configuration**
Pin 1	GND	-	-	CN5 Pin 23	Ground
Pin 2	GND	-	-	GND	Ground
Pin 3	GND	-	-	GND	Ground
Pin 4	DS	DS	-	PB2	GPIO_Output (Data Set)
Pin 5	SHCP	SHCP	-	PB8 (CLK)	Clock
Pin 6	STCP	STCP	-	PB4	GPIO_Output (Latch)
Pin 7	GND	-	-	GND	Ground
Pin 8	SPI_Data_In (Single)	-	SDI	PB12 (SPI2_MISO)	SPI2_MISO
Pin 9	Clock	-	SCK	PB10 (SPI2_SCK)	SPI2_SCK
Pin 10	Vcc	-	VDD	VDD (3.3V)	Power
Pin 11	GND	-	-	GND	Ground
Pin 12	GND	-	-	GND	Ground

DAC_OUTPUT		
Header Pin	Description	MCP4811 Connection
Pin 1	D8_DAC_OUT_16	D8_MCP4811_VOUTA
Pin 2	D8_DAC_OUT_15	D8_MCP4811_VOUTB
Pin 3	D7_DAC_OUT_14	D7_MCP4811_VOUTA
Pin 4	D7_DAC_OUT_13	D7_MCP4811_VOUTB
Pin 5	D6_DAC_OUT_12	D6_MCP4811_VOUTA
Pin 6	D6_DAC_OUT_11	D6_MCP4811_VOUTB
Pin 7	D5_DAC_OUT_10	D5_MCP4811_VOUTA
Pin 8	D5_DAC_OUT_9	D5_MCP4811_VOUTB
Pin 9	D4_DAC_OUT_8	D4_MCP4811_VOUTA
Pin 10	D4_DAC_OUT_7	D4_MCP4811_VOUTB
Pin 11	D3_DAC_OUT_6	D3_MCP4811_VOUTA
Pin 12	D3_DAC_OUT_5	D3_MCP4811_VOUTB
Pin 13	D2_DAC_OUT_4	D2_MCP4811_VOUTA
Pin 14	D2_DAC_OUT_3	D2_MCP4811_VOUTB
Pin 15	D1_DAC_OUT_2	D1_MCP4811_VOUTA
Pin 16	D1_DAC_OUT_1	D1_MCP4811_VOUTB
Pin 17	GND	-
Pin 18	GND	-
Pin 19	GND	-
Pin 20	GND	-

ADC_Header					
ADC_Header_1*12	**Description**	**MCP3008 U1**	**MCP3008 U2**	**Nucleo Pin**	**Pin Configuration**
Pin 1	GND	-	-	CN10 Pin 20	GND
Pin 2	CLK	CLK	CLK	PA5 (CN5 Pin 5)	SPI1_SCK
Pin 3	GND	-	-	**CN6 Pin 8** (GND)	Ground
Pin 4	SPI_Data_In (Duo)	Din	Din	PA7 (CN5 Pin 7)	SPI1_MOSI
Pin 5	VDD	VDD	VDD	+3.3V (CN6 Pin 16)	Power
Pin 6	Vref	Vref	Vref	+3.3V (CN6 Pin 16)	Reference Voltage
Pin 7	CS_U2	-	CS_U2	PC14 (CN7 Pin 25)	GPIO_Output (Chip Select)
Pin 8	CS_U1	CS_U1	-	PC15 (CN7 Pin 27)	GPIO_Output (Chip Select)
Pin 9	Dout_U2	-	Dout_U2	PA6 (CN5 Pin 12)	SPI1_MISO
Pin 10	Dout_U1	-	Dout_U1	A1 (CN9 Pin 16)！！！！	Need Ian's help on this one
Pin 11	GND	A&D_GND	A&D_GND	CN10 Pin 20	Ground
Pin 12	GND	A&D_GND	A&D_GND	CN10 Pin 20	Ground

ADC_Analog_Output		
Header Pin	Description	MCP3008 Connection
Pin 1	U1_ADC_CH7	MCP3008_U1_ADC_CH7
Pin 2	U2_ADC_CH0	MCP3008_U2_ADC_CH0
Pin 3	U1_ADC_CH6	MCP3008_U1_ADC_CH6
Pin 4	U1_ADC_CH1	MCP3008_U1_ADC_CH1
Pin 5	U1_ADC_CH5	MCP3008_U1_ADC_CH5
Pin 6	U2_ADC_CH2	MCP3008_U2_ADC_CH2
Pin 7	U1_ADC_CH4	MCP3008_U1_ADC_CH4
Pin 8	U2_ADC_CH3	MCP3008_U2_ADC_CH3
Pin 9	U1_ADC_CH3	MCP3008_U1_ADC_CH3
Pin 10	U2_ADC_CH4	MCP3008_U2_ADC_CH4
Pin 11	U1_ADC_CH2	MCP3008_U1_ADC_CH2
Pin 12	U2_ADC_CH5	MCP3008_U2_ADC_CH5
Pin 13	U1_ADC_CH1	MCP3008_U1_ADC_CH1
Pin 14	U2_ADC_CH6	MCP3008_U2_ADC_CH6
Pin 15	U1_ADC_CH0	MCP3008_U1_ADC_CH0
Pin 16	U2_ADC_CH7	MCP3008_U2_ADC_CH7
Pin 17	GND	-
Pin 18	GND	-
Pin 19	GND	-
Pin 20	GND	-

Digital_Output		
Header Pin	Description	74HC595 Connection
Pin 1	GND	
Pin 2	Digital_OUT_1	U1_Q0
Pin 3	Digital_OUT_2	U1_Q1
Pin 4	Digital_OUT_3	U1_Q2
Pin 5	Digital_OUT_4	U1_Q3
Pin 6	Digital_OUT_5	U1_Q4
Pin 7	Digital_OUT_6	U1_Q5
Pin 8	Digital_OUT_7	U1_Q6
Pin 9	Digital_OUT_8	U1_Q7
Pin 10	GND	-
Pin 11	GND	-
Pin 12	Digital_OUT_9	U2_ Q0
Pin 13	Digital_OUT_10	U2_ Q1
Pin 14	Digital_OUT_11	U2_ Q2
Pin 15	Digital_OUT_12	U2_ Q3
Pin 16	Digital_OUT_13	U2_ Q4
Pin 17	Digital_OUT_14	U2_ Q5
Pin 18	Digital_OUT_15	U2_ Q6
Pin 19	Digital_OUT_16	U2_ Q7
Pin 20	GND	-

Digital_OUT_Header					
Digital_Output_BUS_8*1	**Description**	**74HC595 U1**	**74HC595 U2**	**Nucleo Pin**	**Pin Configuration**
Pin 1	GND	-	-	GND	Ground
Pin 2	VDD	VDD	VDD	VDD	Power
Pin 3	GND	-	-	GND	Ground
Pin 4	LATCH	LATCH	LATCH	PA9	GPIO_Output (Latch)
Pin 5	DATA	DATA	Q7'	PB2	GPIO_Output (Data Set)
Pin 6	GND	-	-	GND	Ground
Pin 7	CLK	CLK	CLK	PA8	Clock
Pin 8	GND	-	-	GND	Ground

Digital_Input		
Header Pin	Description	74HC165 Connection
Pin 1	GND	
Pin 2	Digital_IN_1	U1_D0
Pin 3	Digital_IN_2	U1_D1
Pin 4	Digital_IN_3	U1_D2
Pin 5	Digital_IN_4	U1_D3
Pin 6	Digital_IN_5	U1_D4
Pin 7	Digital_IN_6	U1_D5
Pin 8	Digital_IN_7	U1_D6
Pin 9	Digital_IN_8	U1_D7
Pin 10	GND	-
Pin 11	GND	-
Pin 12	Digital_IN_9	U2_D0
Pin 13	Digital_IN_10	U2_D1
Pin 14	Digital_IN_11	U2_D2
Pin 15	Digital_IN_12	U2_D3
Pin 16	Digital_IN_13	U2_D4
Pin 17	Digital_IN_14	U2_D5
Pin 18	Digital_IN_15	U2_D6
Pin 19	Digital_IN_16	U2_D7
Pin 20	GND	-

Digital_Input_BUS_8*1	Description	74HC165 U1	74HC165 U2	Nucleo Pin	Pin Configuration
			DIgital_In_Header		
Pin 1	GND	-	-	GND	Ground
Pin 2	VDD	VDD	VDD	VDD	Power
Pin 3	GND	-	-	GND	Ground
Pin 4	DATA	QS	DS*	PA10	GPIO_Output (Data In)
Pin 5	LATCH	LVS	LVS	PA9	GPIO_Output (Latch)
Pin 6	GND	-	-	GND	Ground
Pin 7	CLK	CLK	CLK	PA8	Clock
Pin 8	GND	-	-	GND	Ground