Li-Po
3.7 V

If the battery has NTC cable,
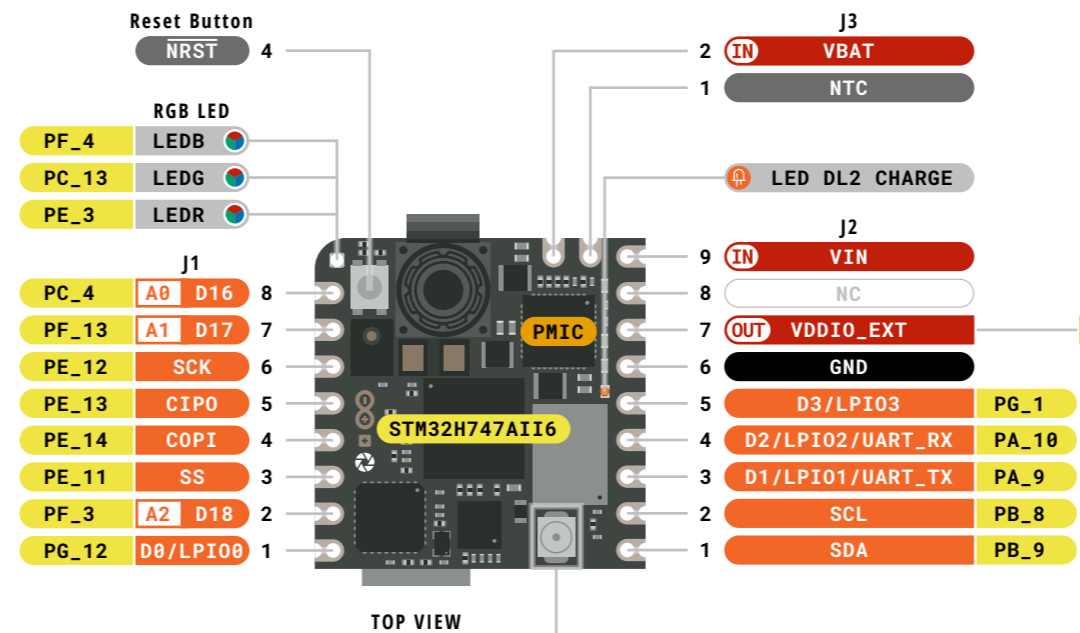connects it to the NTC pin J3-1

TOP VIEW

ⓘ The battery also connects
with the Battery Connector J4
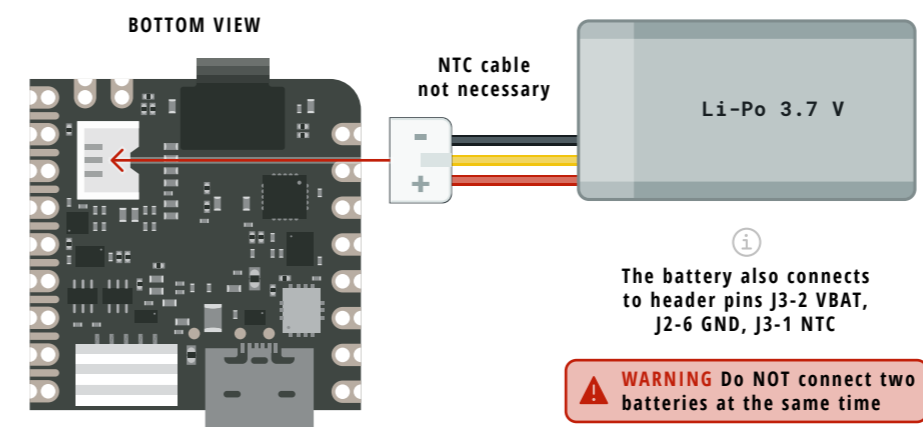on the bottom of the board

⚠ **WARNING** Do **NOT** connect two
batteries at the same time

Reset Button
NRST 4

RGB LED
PF_4 LEDB ●
PC_13 LEDG ●
PE_3 LEDR ●

J1
PC_4   A0 D16   8
PF_13 A1 D17   7
PE_12 SCK   6
PE_13 CIPO   5
PE_14 COPI   4
PE_11 SS   3
PF_3   A2 D18   2
PG_12 D0/LPIO0   1

TOP VIEW

STM32H747AII6

PMIC

J3
2 IN VBAT
1   NTC

🔒 LED DL2 CHARGE

J2
9 IN   VIN
8   NC
7 OUT VDDIO_EXT ────── PMIC BUCK SW2
6   GND
5   D3/LPIO3   PG_1
4   D2/LPIO2/UART_RX PA_10
3   D1/LPIO1/UART_TX PA_9
2   SCL   PB_8
1   SDA   PB_9

Digital Pins voltage level can be forced
externally through VDDIO_EXT or
internally set to 3.3V or 1.8V with:
nicla::enable3V3LDO() and
nicla::enable1V8LDO() respectively.

Analog pins work only at 1.8V

Connect the provided WiFi/Bluetooth
Antenna (MOLEX 2.4/5GHz) with the
Micro UFL connector on the Nicla Vision

BOTTOM VIEW

NTC cable
not necessary

Li-Po 3.7 V

ⓘ The battery also connects
to header pins J3-2 VBAT,
J2-6 GND, J3-1 NTC

ⓘ The battery also connects
to header pins J3-2 VBAT,
J2-6 GND, J3-1 NTC

⚠ **WARNING** Do **NOT** connect two
batteries at the same time

Legend:

■ Power
IN Power Input
OUT Power Output
■ Ground

■ GPIO Digital External
□ Analog External
■ Main Part
■ Secondary Part
■ Internal Component
■ Other Pins (Reset, System
Control, Debugging)

🔒 LED
● RGB LED
□ Other

⚠ **MAXIMUM** LPIOs are driven by
bidirectional translators powered
by VDDIO_EXT. These translators
are meant for low power and can
only drive very limited current.
Please check translator datasheet
for details.
VDDIO_EXT is software
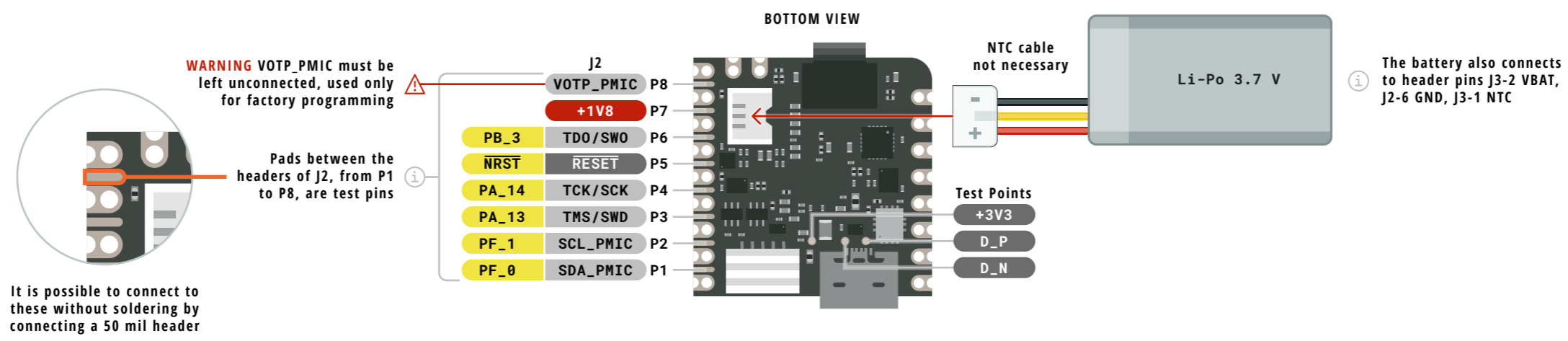programmable between 1.8 and 3.3V

ⓘ CIPO/COPI have previously been
referred to as MISO/MOSI

ARDUINO

**NICLA
VISION**

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WARNING VOTP_PMIC must be left unconnected, used only for factory programming

Pads between the headers of J2, from P1 to P8, are test pins

It is possible to connect to these without soldering by connecting a 50 mil header

BOTTOM VIEW

J2

	VOTP_PMIC	P8
	+1V8	P7
PB_3	TDO/SWO	P6
NRST	RESET	P5
PA_14	TCK/SCK	P4
PA_13	TMS/SWD	P3
PF_1	SCL_PMIC	P2
PF_0	SDA_PMIC	P1

NTC cable not necessary

Li-Po 3.7 V

The battery also connects to header pins J3-2 VBAT, J2-6 GND, J3-1 NTC

Test Points
- +3V3
- D_P
- D_N

Legend:

Power
Ground
IN Power Input
OUT Power Output

GPIO Digital External
Analog External
Main Part
Secondary Part
Internal Component
Other Pins (Reset, System Control, Debugging)

LED
RGB LED
Other

⚠ **MAXIMUM** LPIOs are driven by bidirectional translators powered by VDDIO_EXT. These translators are meant for low power and can only drive very limited current. Please check translator datasheet for details.
VDDIO_EXT is software programmable between 1.8 and 3.3V

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ARDUINO
NICLA VISION

SKU code: ABX00051
Full Pinout - Page 2 of 9
Last update: 7 Oct, 2022

WARNING!

Advanced Section

The following information is for advanced use only and may not be officially supported by Arduino software

TOP VIEW

Reset Button

| NRST | 4 |

RGB LED

PF_4	LEDB 🔵
PC_13	LEDG 🟢
PE_3	LEDR 🔴

J1

Level Shifter U11 TXB0108YZPR

B5	PC_4	A0	D16	8
B6	PF_13	A1	D17	7
B7	PE_12	SCK		6
B8	PE_13	CIPO		5
	PE_14	COPI		4
	PE_11	SS		3
	PF_3	A2	D18	2
B1	PG_12	D0/LPIO0		1

STM32H747AII6

Battery Fuel Gauge U19 MAX17262REWL+T

J3

| 2 | IN | VBAT | | A2 BATT |
| 1 | | NTC | | 32 THM/38 NT2P7 |

| | 🔶 LED DL2 CHARGE | VSYS | 40 CHGB |

J2

9	IN	VIN		
8		NC		
7	OUT	VDDIO_EXT		PMIC BUCK SW2
6		GND		
5		D3/LPIO3	PG_1	B4
4		D2/LPIO2/UART_RX	PA_10	B3
3		D1/LPIO1/UART_TX	PA_9	B2
2		SCL	PB_8	B3
1		SDA	PB_9	B2

PMIC

Level Shifter U11 TXB0108YZPR

Level Shifter U12 NTS0304EUKZ

Digital Pins voltage level can be forced externally through VDDIO_EXT or internally set to 3.3V or 1.8V with: nicla::enable3V3LDO() and nicla::enable1V8LDO() respectively.

Analog pins work only at 1.8V

Connect the provided WiFi/Bluetooth Antenna (MOLEX 2.4/5GHz) with the Micro UFL connector on the Nicla Vision

+1V8   VDDIO_EXT (+3V3)

| Level Shifter U11 TXB0108YZPR |
| Level Shifter U12 NTS0304EUKZ |

NICLA VISION (INTERNAL)   HEADERS (EXTERNAL)

Legend:

- 🟥 **Power**
- 🟥 ⬛ **Ground**
- IN **Power Input**
- OUT **Power Output**
- 🟧 **GPIO Digital External**
- ⬜ **Analog External**
- 🟨 **Main Part**
- 🟧 **Secondary Part**
- ⬜ **Internal Component**
- ⬛ **Other Pins (Reset, System Control, Debugging)**
- 🔶 **LED**
- 🔵 **RGB LED**
- ⬜ **Other**

⚠️ **MAXIMUM** LPIOs are driven by bidirectional translators powered by VDDIO_EXT. These translators are meant for low power and can only drive very limited current. Please check translator datasheet for details.
VDDIO_EXT is software programmable between 1.8 and 3.3V.

ⓘ CIPO/COPI have previously been referred to as MISO/MOSI

ARDUINO NICLA VISION

SKU code: ABX00051
Full Pinout - Page 4 of 9
Last update: 7 Oct, 2022

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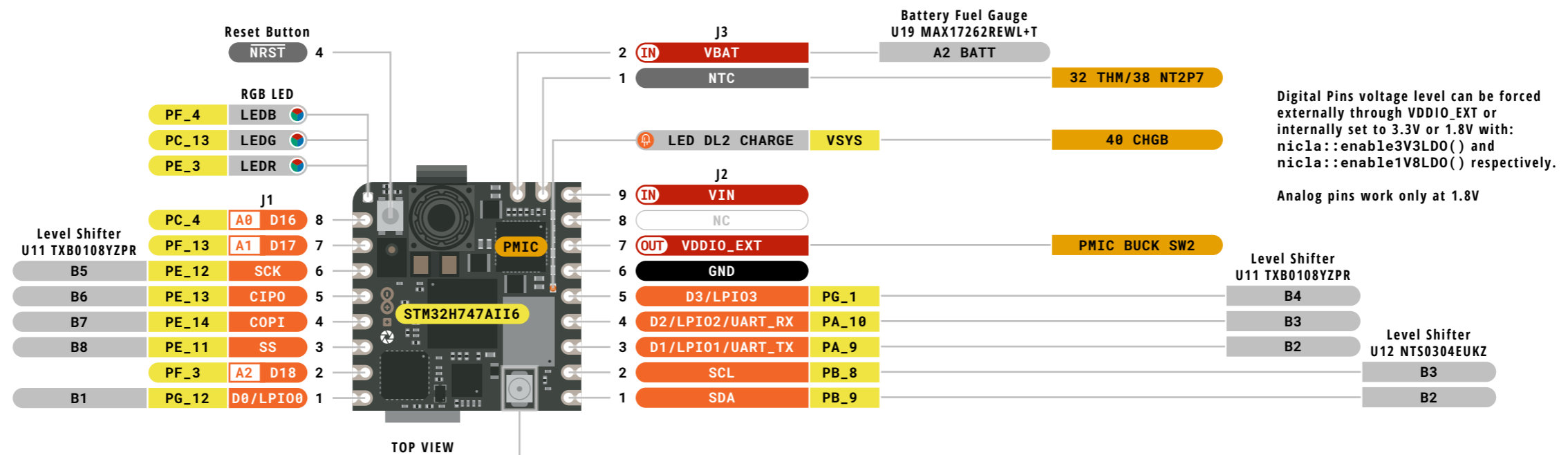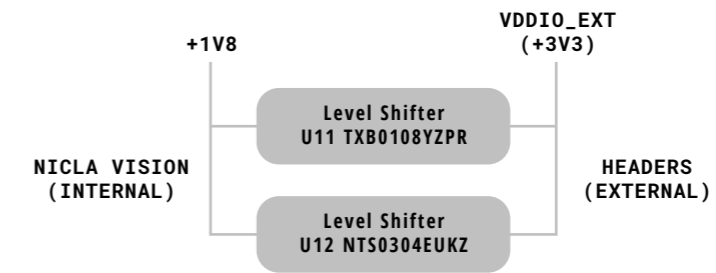
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Microcontroller U1H STM32H747AII6

Pin	LEVEL SHIFTERS	ADC/DAC	I2C/I2S	SPI	UART/USART	TIMER	HRTIM (high resolution timer)
NRST							
PB_3						TIM2_CH2	HRTIM_FLT4
PG_1	J2-5 LPIO3	U11-A4					
PA_14							
PA_10	J2-4 LPIO2	U11-A3			UART1_RX	TIM1_CH3	HRTIM_CHC2
PA_13							
PA_9	J2-3 LPIO1	U11-A2			UART1_TX	TIM1_CH2	HRTIM_CHC1
PF_1							
PB_8	J2-2 SCL	U12-A3	I2C1_SCL		UART4_RX	TIM16_CH1/TIM4_CH3	
PF_0							
PB_9	J2-1 SDA	U12-A2	I2C1_SDA		UART4_TX	TIM17_CH1/TIM4_CH4	
PC_4	J1-8 A0		ADC12_INP4				
PF_13	J1-7 A1		ADC2_INP2				
PE_12	J1-6 SCLK	U11-A5		SPI4_SCK		TIM1_CH3N	
PE_13	J1-5 CIPO	U11-A6		SPI4_CIPO		TIM1_CH3	
PE_14	J1-4 COPI	U11-A7		SPI4_COPI		TIM1_CH4	
PE_11	J1-3 CS	U11-A8		SPI4_NSS		TIM1_CH2	
PF_3	J1-2 A2		ADC3_INP5				
PG_12	J1-1 LPIO0	U11-A1				HRTIM_EEV5	LPTIM1_IN1

(LPTIM — low power timer)

WiFi/BLE U9 LBEE5KL1DX-883

#	Signal	Pin	I2C/I2S	UART/USART
2	RX	PB_6		USART1_TX
3	TX	PB_7		USART1_RX
4	CTS	PA_12		USART1_RTS
5	RTS	PA_11		USART1_CTS
8	BT_PCMSYNC	PA_15	I2S3_WS	
9	BT_PCMIN	PB_2	I2S3_SDO	
10	BT_PCMOUT	PC_11	I2S3_SDI	
11	BT_PCMCLK	PC_10	I2S3_CK	
24	DATA0	PB_14		
26	DATA1	PB_15		
23	DATA2	PG_11		
25	DATA3	PB_4		
20	CLK	PD_6		
22	CMD	PD_7		
37	LPO IN	PC_14-OSC32_IN		
27	WL_WAKE_H	PD_15		
39	BT_WAKE_D	PE_9		
38	BT_WAKE_H	PD_14		
41	ANT	J6-U.FL-R-SMT-1		
14	BT_ON	PF_14		
28	WL_ON	PG_4		

J3
| 2 | IN | VBAT |
| 1 | | NTC |

J2
9	IN	VIN
8		NC
7	OUT	VDDIO_EXT
6		GND
5		D3/LPIO3
4		D2/LPIO2/UART_RX
3		D1/LPIO1/UART_TX
2		SCL
1		SDA

J1
A0 D16	8
A1 D17	7
SCK	6
CIPO	5
COPI	4
SS	3
A2 D18	2
D0/LPIO0	1

Connect the provided WiFi/Bluetooth Antenna (MOLEX 2.4/5GHz) with the Micro UFL connector on the Nicla Vision

Legend:

- Power
- IN Power Input
- OUT Power Output
- Ground
- GPIO Digital External
- Analog External
- Main Part
- Secondary Part
- Internal Component
- Other Pins (Reset, System Control, Debugging)
- I2C — D Default
- SPI — D Default
- UART/USART — D Default
- Other SERIAL Communication
- Analog — D Default
- PWM/Timer
- LED
- RGB LED
- Other

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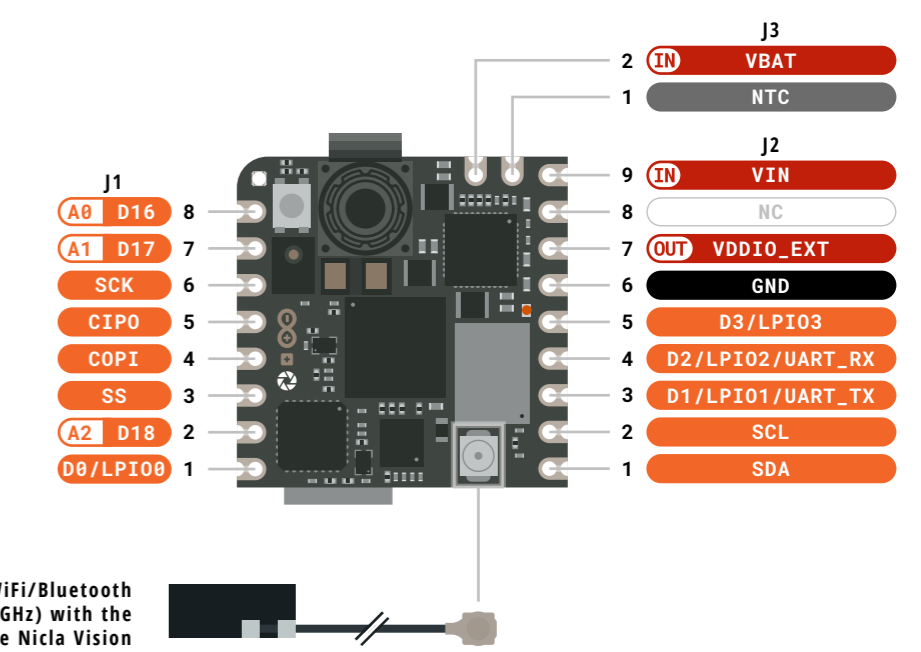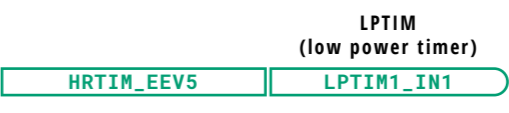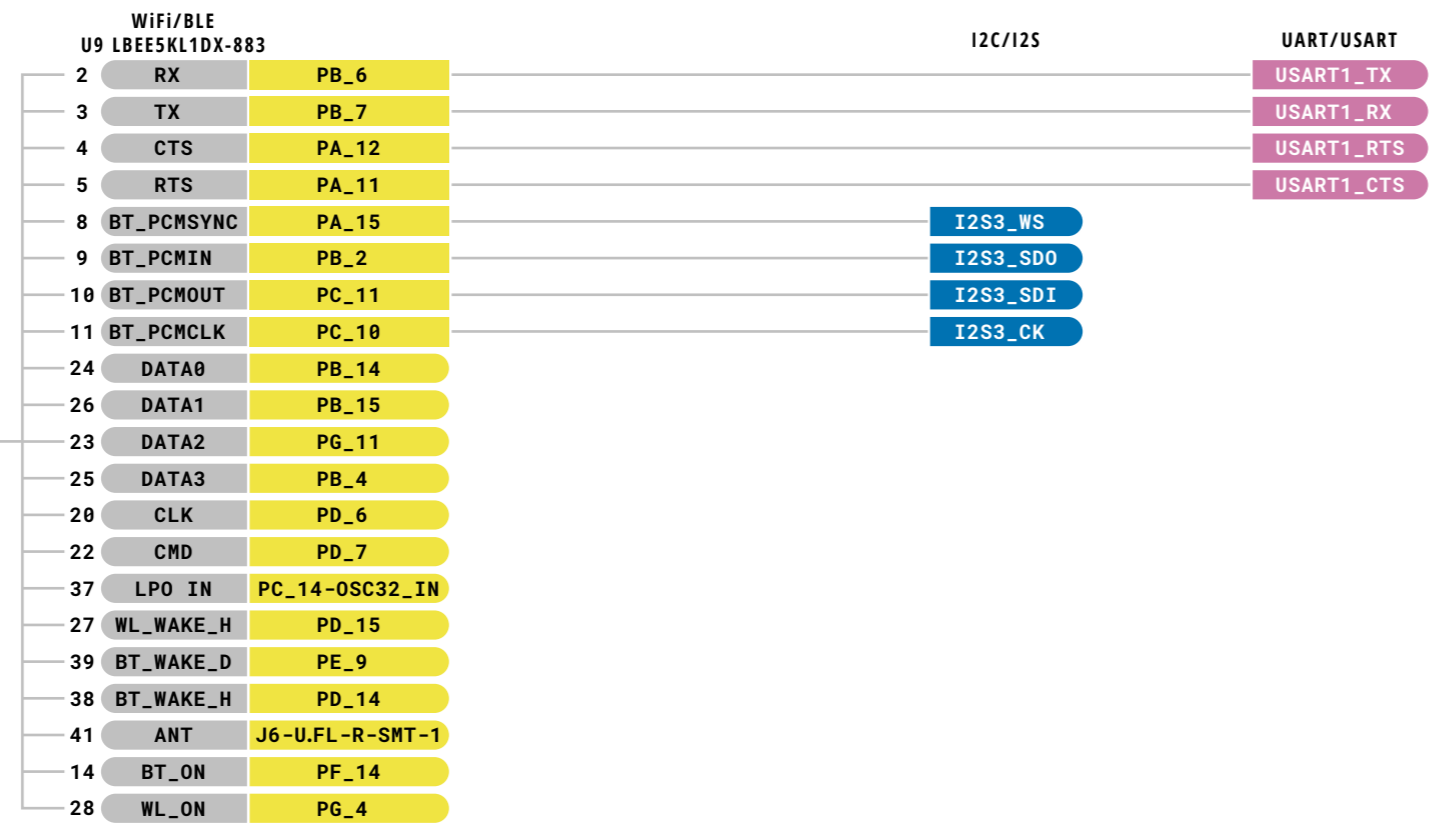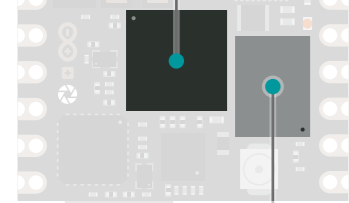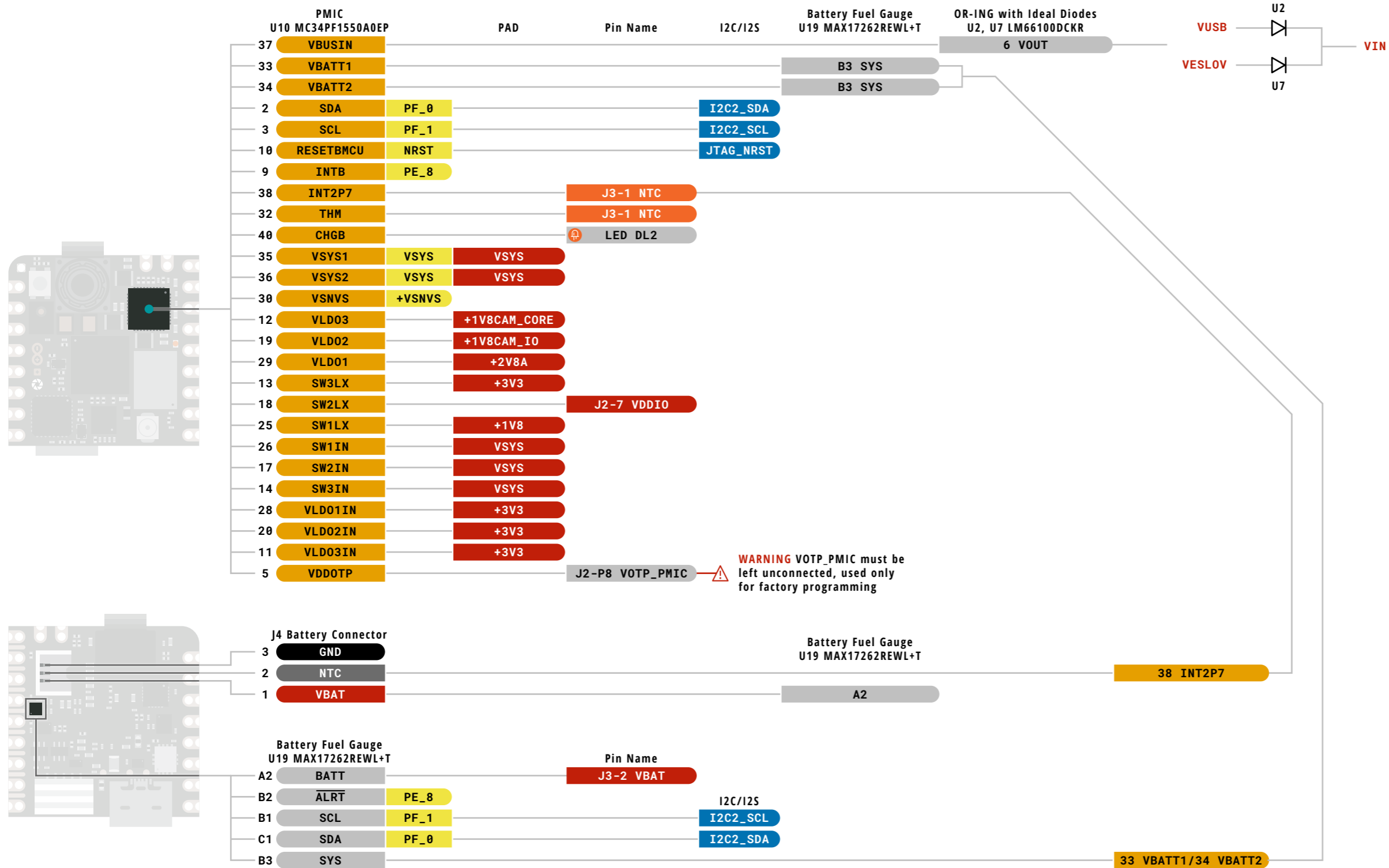VDDIO_EXT is software programmable between 1.8 and 3.3V

ℹ CIPO/COPI have previously been referred to as MISO/MOSI

ARDUINO — NICLA VISION

DOCS.ARDUINO.CC

PMIC
U10 MC34PF1550A0EP

Pin	PMIC	PAD	Pin Name	I2C/I2S	Battery Fuel Gauge U19 MAX17262REWL+T	OR-ING with Ideal Diodes U2, U7 LM66100DCKR
37	VBUSIN					6 VOUT
33	VBATT1				B3 SYS	
34	VBATT2				B3 SYS	
2	SDA	PF_0		I2C2_SDA		
3	SCL	PF_1		I2C2_SCL		
10	RESETBMCU	NRST		JTAG_NRST		
9	INTB	PE_8				
38	INT2P7		J3-1 NTC			
32	THM		J3-1 NTC			
40	CHGB		LED DL2			
35	VSYS1	VSYS	VSYS			
36	VSYS2	VSYS	VSYS			
30	VSNVS	+VSNVS				
12	VLDO3		+1V8CAM_CORE			
19	VLDO2		+1V8CAM_IO			
29	VLDO1		+2V8A			
13	SW3LX		+3V3			
18	SW2LX		J2-7 VDDIO			
25	SW1LX		+1V8			
26	SW1IN		VSYS			
17	SW2IN		VSYS			
14	SW3IN		VSYS			
28	VLDO1IN		+3V3			
20	VLDO2IN		+3V3			
11	VLDO3IN		+3V3			
5	VDDOTP		J2-P8 VOTP_PMIC			

U2 — VUSB
U7 — VESLOV
VIN

WARNING VOTP_PMIC must be left unconnected, used only for factory programming ⚠️

J4 Battery Connector

				Battery Fuel Gauge U19 MAX17262REWL+T
3	GND			
2	NTC			38 INT2P7
1	VBAT		A2	

Battery Fuel Gauge
U19 MAX17262REWL+T

		PAD	Pin Name	I2C/I2S
A2	BATT		J3-2 VBAT	
B2	ALRT	PE_8		
B1	SCL	PF_1		I2C2_SCL
C1	SDA	PF_0		I2C2_SDA
B3	SYS			

33 VBATT1/34 VBATT2

Legend:

- **Power** (Power)
- **Power Input** (IN)
- **Power Output** (OUT)
- **Ground**
- **GPIO Digital External**
- **Analog External**
- **Main Part**
- **Secondary Part**
- **Internal Component**
- **Other Pins (Reset, System Control, Debugging)**
- **I2C** — Default (D)
- **SPI** — Default (D)
- **UART/USART** — Default (D)
- **Other SERIAL Communication**
- **Analog** — Default (D)
- **PWM/Timer**
- **LED**
- **RGB LED**
- **Other**

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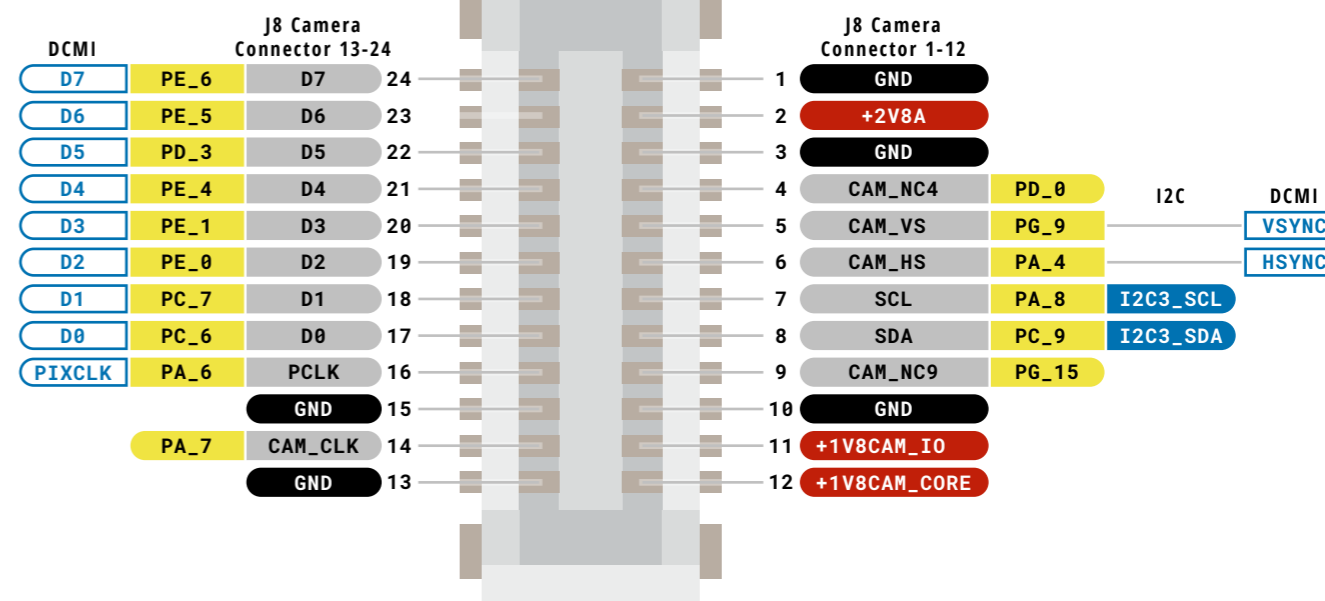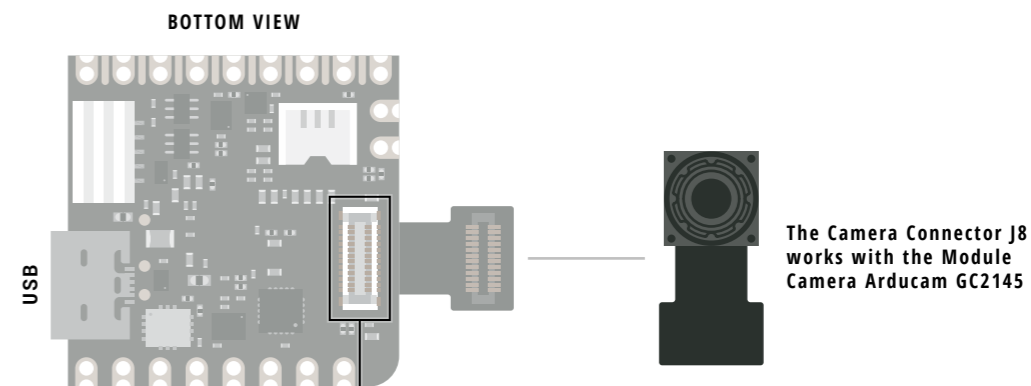VDDIO_EXT is software programmable between 1.8 and 3.3V

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ARDUINO
NICLA VISION

SKU code: ABX00051
Full Pinout - Page 6 of 9
Last update: 7 Oct, 2022

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Microphone
U6 MP34DT06JTR

PDM

Pin	Signal	Port	PDM
3	CLK	PD_10	CK
4	DOUT	PE_7	D0
1	+1V8 VDD		

Time of Fligth
U4 VL53L1CBV0FY/1

I2C/I2S

Pin	Signal	Port	I2C/I2S
5	XSHUT	PG_10	
10	SCL	PF_1	I2C2_SCL
9	SDA	PF_0	I2C2_SDA
7	GPIO1	PD_8	
1	+2V8A AVDDVCSEL		
11	+2V8A AVDD		

IMU 6-Axis
U3 LSM6DSOXTR

SPI

Pin	Signal	Port	SPI
1	SDO/SA0	PF_8	SPI5_CIPO
14	SDA	PF_11	SPI5_COPI
13	SCL	PF_7	SPI5_SCLK
12	CS	PF_6	SPI5_CS
4	INT1	PA_1	
9	INT2	PD_4	
8	+1V8 VDD		
5	+1V8 VDDIO		

BOTTOM VIEW

BOTTOM VIEW

TOP VIEW

USB

BOTTOM VIEW

USB

The Camera Connector J8 works with the Module Camera Arducam GC2145

DCMI | **J8 Camera Connector 13-24**

DCMI	Port	Signal	Pin
D7	PE_6	D7	24
D6	PE_5	D6	23
D5	PD_3	D5	22
D4	PE_4	D4	21
D3	PE_1	D3	20
D2	PE_0	D2	19
D1	PC_7	D1	18
D0	PC_6	D0	17
PIXCLK	PA_6	PCLK	16
		GND	15
	PA_7	CAM_CLK	14
		GND	13

J8 Camera Connector 1-12

I2C | **DCMI**

Pin	Signal	Port	I2C	DCMI
1	GND			
2	+2V8A			
3	GND			
4	CAM_NC4	PD_0		
5	CAM_VS	PG_9		VSYNC
6	CAM_HS	PA_4		HSYNC
7	SCL	PA_8	I2C3_SCL	
8	SDA	PC_9	I2C3_SDA	
9	CAM_NC9	PG_15		
10	GND			
11	+1V8CAM_IO			
12	+1V8CAM_CORE			

Legend:

- Power
- IN Power Input
- OUT Power Output
- Ground
- GPIO Digital External
- Analog External
- Main Part
- Secondary Part
- Internal Component
- Other Pins (Reset, System Control, Debugging)
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- SPI — D Default
- UART/USART — D Default
- Other SERIAL Communication
- Analog — D Default
- PWM/Timer
- LED
- RGB LED
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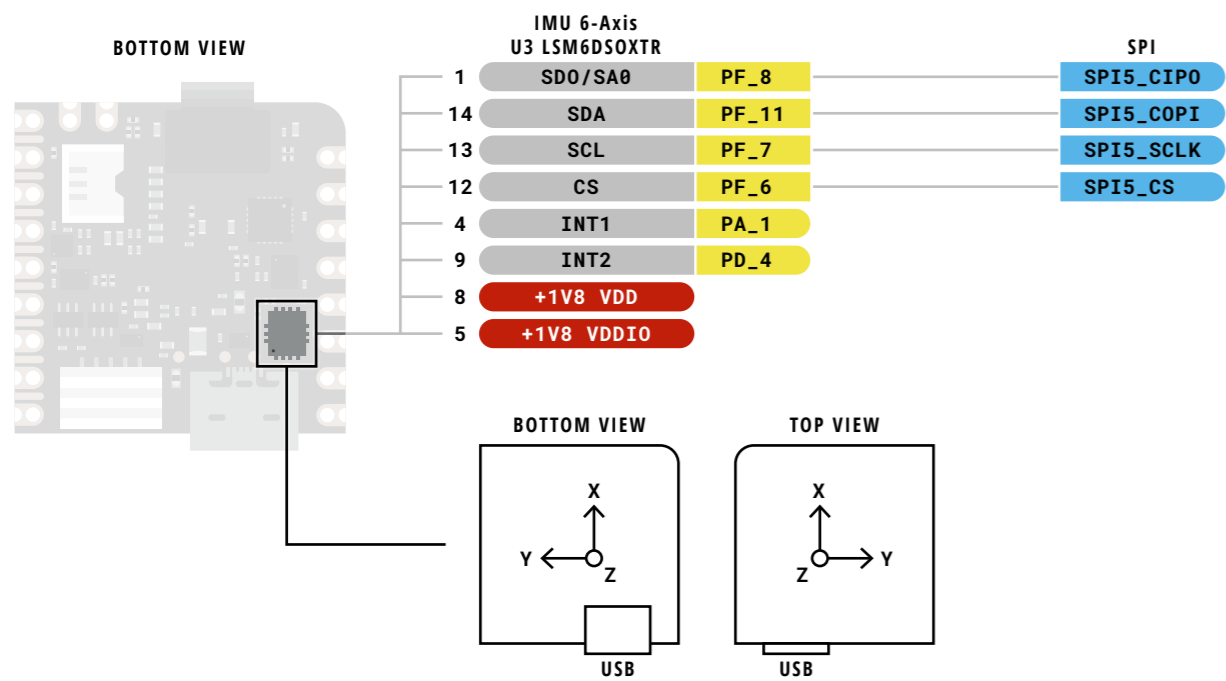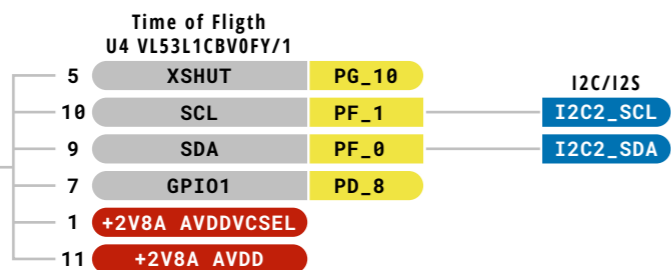VDDIO_EXT is software programmable between 1.8 and 3.3V
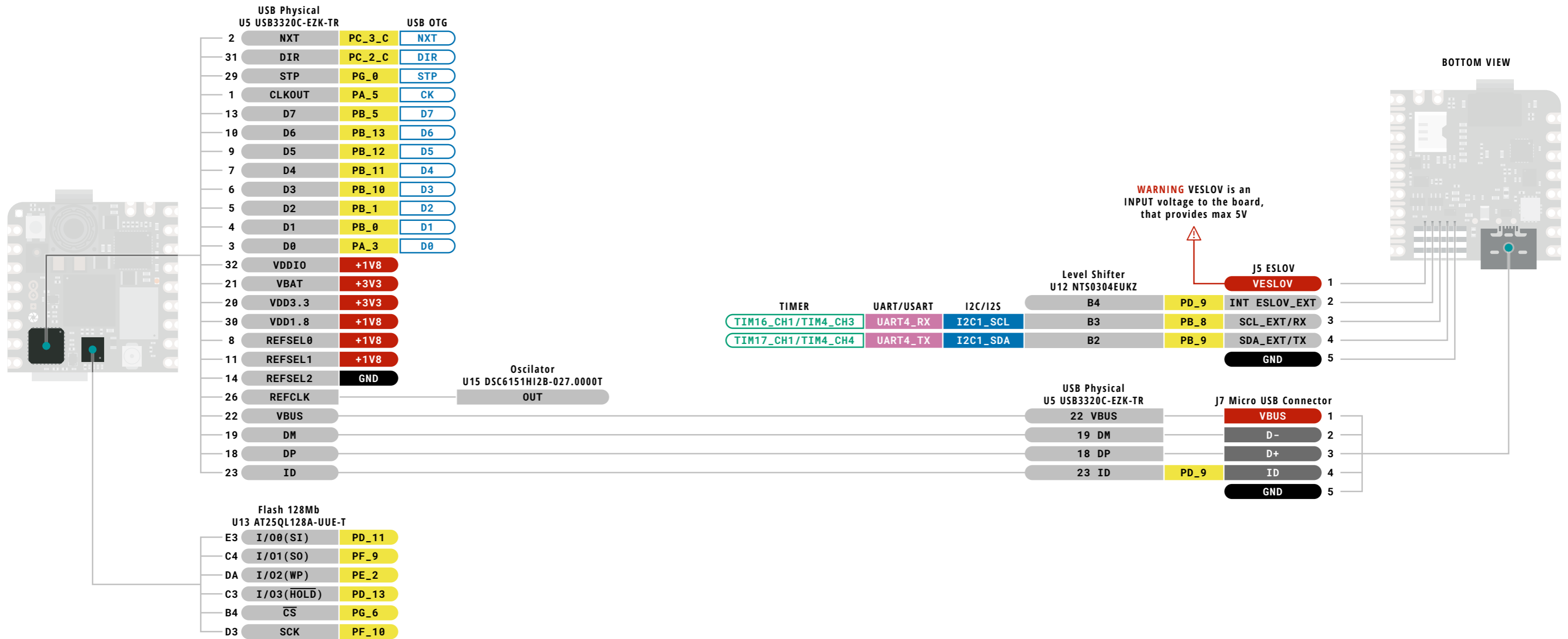
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NICLA VISION
ⓘ ARDUINO

SKU code: ABX00051
Full Pinout - Page 7 of 9
Last update: 7 Oct, 2022

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USB Physical
U5 USB3320C-EZK-TR   **USB OTG**

2	NXT	PC_3_C	NXT
31	DIR	PC_2_C	DIR
29	STP	PG_0	STP
1	CLKOUT	PA_5	CK
13	D7	PB_5	D7
10	D6	PB_13	D6
9	D5	PB_12	D5
7	D4	PB_11	D4
6	D3	PB_10	D3
5	D2	PB_1	D2
4	D1	PB_0	D1
3	D0	PA_3	D0
32	VDDIO	+1V8	
21	VBAT	+3V3	
20	VDD3.3	+3V3	
30	VDD1.8	+1V8	
8	REFSEL0	+1V8	
11	REFSEL1	+1V8	
14	REFSEL2	GND	
26	REFCLK		
22	VBUS		
19	DM		
18	DP		
23	ID		

Oscilator
U15 DSC6151HI2B-027.0000T

| REFCLK | OUT |

WARNING VESLOV is an INPUT voltage to the board, that provides max 5V

J5 ESLOV

	VESLOV	1
Level Shifter		
U12 NTS0304EUKZ		
B4	PD_9	INT ESLOV_EXT	2

TIMER	**UART/USART**	**I2C/I2S**			
TIM16_CH1/TIM4_CH3	UART4_RX	I2C1_SCL	B3	PB_8	SCL_EXT/RX	3
TIM17_CH1/TIM4_CH4	UART4_TX	I2C1_SDA	B2	PB_9	SDA_EXT/TX	4
					GND	5

USB Physical
U5 USB3320C-EZK-TR   **J7 Micro USB Connector**

22 VBUS		VBUS	1
19 DM		D-	2
18 DP		D+	3
23 ID	PD_9	ID	4
		GND	5

BOTTOM VIEW

Flash 128Mb
U13 AT25QL128A-UUE-T

E3	I/O0(SI)	PD_11
C4	I/O1(SO)	PF_9
DA	I/O2(WP)	PE_2
C3	I/O3(HOLD)	PD_13
B4	CS	PG_6
D3	SCK	PF_10

LEVEL SHIFTERS

U11 TXB0108YZPR

Pin	Signal	Port	VCCA
	+1V8		VCCA
PG_12	GPIO0	A1	
PA_9	GPIO1	A2	
PA_10	GPIO2	A3	
PG_1	GPIO3	A4	
PE_12	SCLK	A5	
PE_13	CIPO	A6	
PE_14	COPI	A7	
PE_11	CS	A8	
	+1V8	OE	
	VDDIO_EXT	VCCB	

SPI
- SPI4_SCLK
- SPI4_CIPO
- SPI4_COPI
- SPI4_CS

Pin Name

Pin Name	Signal	
J1-1 LPIO0	LPIO0_EXT	B1
J2-3 LPIO1	LPIO1_EXT	B2
J2-4 LPIO2	LPIO2_EXT	B3
J2-5 LPIO3	LPIO3_EXT	B4
J1-6 SCLK	SCLK_EXT	B5
J1-5 CIPO	CIPO_EXT	B6
J1-4 COPI	COPI_EXT	B7
J1-3 CS	CS_EXT	B8

U12 NTS0304EUKZ

Pin	Signal	Port	
	+1V8	VCCA	
		A1	
PB_9	SDA	A2	
PB_8	SCL	A3	
PD_9	INT_ESLOV	A4	
	VDDIO_EXT	VCCB	

I2C/I2S
- I2C1_SDA
- I2C1_SCL

Pin Name

Pin Name	Signal	
		B1
J2-1 SDA	SDA	B2
J2-2 SCL	SCL	B3
ESLOV J5-2 INT	INT_ESLOV_EXT	B4

TOP VIEW

BOTTOM VIEW

OSCILLATORS

U14 DSC6151HI2B-025.0000

Pin	Signal		RCC (clock)	SYS (event)	GPIO
1	STANDBY	PH_1-OSC_OUT	OSC_OUT	EVENTOUT	GPIO
3	OUT 25MHz				
4	+1V8 VDD				

U15 DSC6151HI2B-027.0000T

Pin	Signal		RCC (clock)	SYS (event)	GPIO
1	STANDBY	PH_1-OSC_OUT	OSC_OUT	EVENTOUT	GPIO
3	OUT 27MHz				
4	+1V8 VDD				

Crypto
U8 SE050C2HQ1/Z01SDZ

Pin	Signal		I2C/I2S
9	SDA	PF_0	I2C2_SDA
10	SCL	PF_1	I2C2_SCL
11	ENA	PG_0	
12	+1V8 VIN		

Oscilator
Y1 SIT1532AI-J4-DCC-32.768E

Pin	Signal
2	CLK 32768Hz
3	+1V8 VDD

OR-ING WITH IDEAL DIODES

U2 LM66100DCKR

Pin	VOUT	PAD	PMIC
6	VOUT		37 VBUSIN
1	VIN	VUSB	
3	CE	VESLOV	
5	ST	VUSB	

U7 LM66100DCKR

Pin	VOUT	PAD	PMIC
6	VOUT		37 VBUSIN
1	VIN	VESLOV	
3	CE	VUSB	

PMIC input voltage has OR-ING with Ideal Diodes

Legend:

- **Power** (Power)
- **IN** Power Input
- **OUT** Power Output
- **Ground** (Ground)
- GPIO Digital External
- Analog External
- Main Part
- Secondary Part
- Internal Component
- Other Pins (Reset, System Control, Debugging)
- **I2C** — **D** Default
- **SPI** — **D** Default
- **UART/USART** — **D** Default
- Other SERIAL Communication
- Analog — **D** Default
- PWM/Timer
- LED
- RGB LED
- Other

MAXIMUM LPIOs are driven by bidirectional translators powered by VDDIO_EXT. These translators are meant for low power and can only drive very limited current. Please check translator datasheet for details.
VDDIO_EXT is software programmable between 1.8 and 3.3V
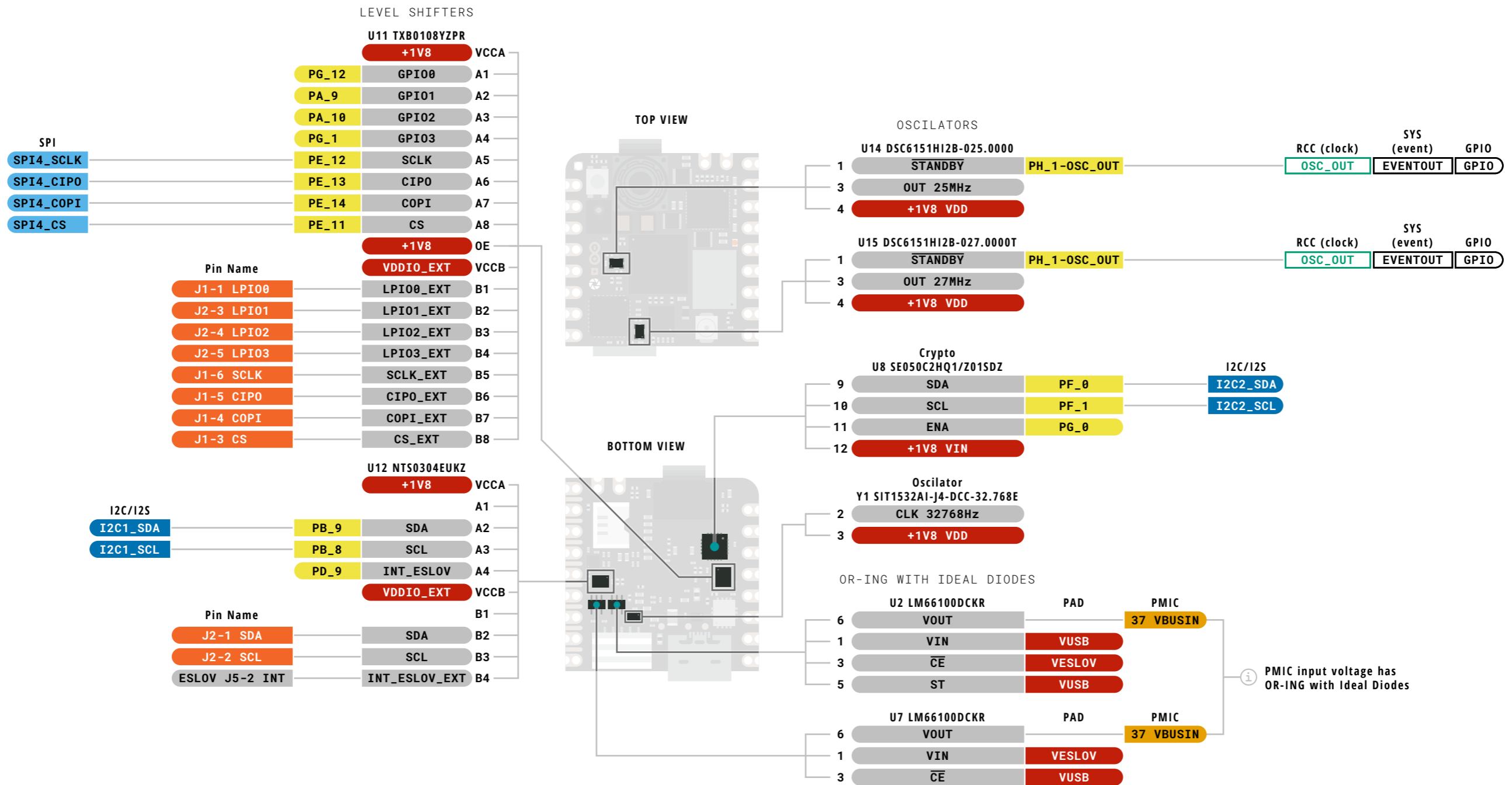
CIPO/COPI have previously been referred to as MISO/MOSI

NICLA VISION
ARDUINO