{{title}}

Preliminary pre-release version 2022-03-14

This is an preliminary pre-release migration guide and the contents are subject to change. The Photon 2 design has not been finalized so changes are likely.

The Photon 2 is a development module with a microcontroller and Wi-Fi networking. The form-factor is similar to the Argon (Adafruit Feather), but the Photon 2 supports 2.4 GHz and 5 GHz Wi-Fi, BLE, and has much larger RAM and flash that can support larger applications.

It is intended to replace both the Photon and Argon modules. It contains the same module as the P2, making it easier to migrate from a pin-based development module to a SMD mass-production module if desired.

Feature	Photon 2	Photon	Argon
User application size	2048 KB (2 MB)	128 KB	256 KB
Flash file system[1]	2 MB		2 MB
MCU	RTL8721DM	STM32F205RGY6	nRF52840
	Realtek Semiconductor	ST Microelectronics	Nordic Semiconductor
CPU	Cortex M33 @ 200 MHz	Cortex M3 @ 120 MHz	Cortex M3 @ 64 MHz
	Cortex M23 @ 20 MHz		
RAM[2]	512 KB	128 KB	256 KB
Flash[3]	16 MB	1 MB	1 MB
Hardware FPU	✓		✓
Secure Boot	✓		
Trust Zone	✓		
Wi-Fi	802.11 a/b/g/n	802.11 b/g/n	802.11 b/g/n
2.4 GHz	✓	✓	✓
5 GHz	✓		
Bluetooth	BLE 5.0		BLE 5.0
NFC Tag			External antenna required
Antenna	Shared for Wi-Fi and BLE	Wi-Fi only	Separate Wi-Fi and BLE antennas
	Built-in PCB antenna (Wi-Fi & BLE)	Built-in PCB antenna (Wi-Fi)	Built-in chip antenna (BLE)
			Required external antenna (Wi-Fi)
	Optional external (Wi-Fi & BLE)[4]	Optional external (Wi-Fi)[4]	Optional external (BLE)[4]
Peripherals	USB 2.0	USB 1.1	USB 1.1
Digital GPIO	20	24	20
Analog (ADC)	6	13	6
Analog (DAC)		2	
UART	3	2	1
SPI	2	2	2
PWM	6	12	8

I2C	1	1	1
CAN		1	
I2S		1	1
JTAG		✓	
SWD	✓	✓	✓

[1]A small amount of the flash file system is used by Device OS, most is available for user data storage using the POSIX filesystem API. This is separate from the flash memory used for Device OS, user application, and OTA transfers.

[2] Total RAM; amount available to user applications is smaller.

[3] Total built-in flash; amount available to user applications is smaller. The Argon also has a 4 MB external flash, a portion of which is available to user applications as a flash file system.

[4] Onboard or external antenna is selectable in software.

There are two Photon 2 migration guides, depending on what you are migrating from:

- From Photon
- From Argon

Hardware

BATTERY SUPPORT

The Photon 2 has a connector for a Li-Po battery and built-in charger. The Photon does not include battery power functionality.

NO 5V TOLERANCE!

On Gen 2 devices (STM32F205), most pins are 5V tolerant. This is not the case for Gen 3 (nRF52840) and the Photon 2 (RTL872x). You must not exceed 3.3V on any GPIO pin, including ports such as serial, I2C, and SPI.

SPI

Both the Photon and Photon 2 have two SPI ports, however the pins are different for both `SPI` and `SPI1`.

Photon Pin Name	Photon SPI	Photon 2 Pin Name	Photon 2 SPI
A2	SPI (SS)	A2 / D17	
A3	SPI (SCK)	D0 / A3	
A4	SPI (MISO)	D1 / A4	
A5	SPI (MOSI)	A5 / D14	SPI (SS)
D2	SPI1 (MOSI)	D2	SPI1 (SCK)
D3	SPI1 (MISO)	D3	SPI1 (MOSI)
D4	SPI1 (SCK)	D4	SPI1 (MISO)
D5	SPI1 (SS)	D5 / WKP	SPI1 (SS)
		MISO / D11	SPI (MISO)
		MOSI / D12	SPI (MOSI)
		SCK / D13	SPI (SCK)
WKP / A7		D5 / WKP	SPI1 (SS)

SPI - Gen 2 devices (including Photon)

	SPI	SPI1
Maximum rate	30 MHz	15 MHz
Default rate	15 MHz	15 MHz
Clock	60 MHz	30 MHz

- Available clock divisors: 2, 4, 8, 16, 32, 64, 128, 256

SPI - Photon 2

	SPI	SPI1
Maximum rate	25 MHz	50 MHz
Hardware peripheral	RTL872x SPI1	RTL872x SPI0

I2C

Both the Photon and Photon 2 have a single I2C port on the same pins, D0/D1.

Photon Pin Name	Photon I2C	Photon 2 Pin Name	Photon 2 I2C
A3		D0 / A3	Wire (SDA)
A4		D1 / A4	Wire (SCL)
D0	Wire (SDA)	D0 / A3	Wire (SDA)
D1	Wire (SCL)	D1 / A4	Wire (SCL)

- The Photon 2 I2C port is not 5V tolerant
- The Photon 2 A3/A4 pins are physically in the same location as D0/D1.
- The Photon pins A3/A4 are D16/D15 on the Photon 2.

SERIAL (UART)

The primary UART serial (`Serial1`) is on the TX and RX pins on both the Photon and Photon 2. There is no hardware flow control on this port on the Photon or Photon 2.

The secondary UART serial (`Serial2`) is on different pins, however it does not conflict with the RGB LED, and also supports CTS/RTS hardware flow control.

Photon Pin Name	Photon Serial	Photon 2 Pin Name	Photon 2 Serial
		D16	Serial3 (RX)
D2		D2	Serial2 (RTS)
D3		D3	Serial2 (TX)
D4		D4	Serial2 (RX)
D5		D5 / WKP	Serial2 (CTS)
		MISO / D11	Serial3 (CTS)
		MOSI / D12	Serial3 (RTS)
RGBB	Serial2 (RX)		
RGBG	Serial2 (TX)		
RX	Serial1 (RX)	RX / D10	Serial1 (RX)
		SCK / D13	Serial3 (TX)
TX	Serial1 (TX)	TX / D9	Serial1 (TX)
WKP / A7		D5 / WKP	Serial2 (CTS)

	Photon	Photon 2
Buffer size	64 bytes	2048 bytes
7-bit mode	✓	✓
8-bit mode	✓	✓
9-bit mode	✓	
1 stop bit	✓	✓
2 stop bits	✓	✓
No parity	✓	✓
Even parity	✓	✓
Odd parity	✓	✓
Break detection	✓	
LIN bus support	✓	
Half duplex	✓	
CTS/RTS flow control		✓[1]

[1]CTS/RTS flow control only on Serial2. It is optional.

ANALOG INPUT (ADC)

For analog to digital conversion (ADC) using `analogRead()`, there are fewer ADC inputs on the Photon 2:

Photon Pin Name	Photon ADC	Photon 2 Pin Name	Photon 2 ADC
A0	✓	A0 / D19	✓
A1	✓	A1 / D18	✓
A2	✓	A2 / D17	✓
A3	✓	D0 / A3	✓
A4	✓	D1 / A4	✓
A5	✓	A5 / D14	✓
D0		D0 / A3	✓
D1		D1 / A4	✓
DAC / A6	✓		
WKP / A7	✓	D5 / WKP	

On the Photon 2, there are no pins A3 (hardware pin 21) and A4 (hardware pin 22); these are NC (no connection). However, Photon 2 pin D0 (hardware pin 36) can be used as an analog input and has the alias A3. The same is true for Photon 2 pin D1 (hardware pin 35), which has the alias A4.

The `setADCSampleTime()` function is not supported on the Photon 2 or P2.

PWM (PULSE-WIDTH MODULATION)

The pins that support PWM are different on the Photon and Photon 2.

Photon Pin Name	Photon PWM	Photon 2 Pin Name	Photon 2 PWM
A2		A2 / D17	✓
A3		D0 / A3	✓
A4	✓	D1 / A4	✓
A5	✓	A5 / D14	✓
D0	✓	D0 / A3	✓
D1	✓	D1 / A4	✓
D2	✓	D2	
D3	✓	D3	✓
D4		D4	✓
RX	✓	RX / D10	
TX	✓	TX / D9	
WKP / A7	✓	D5 / WKP	

All available PWM pins on the Photon 2 share a single timer. This means that they must all share a single frequency, but can have different duty cycles.

DIGITAL TO ANALOG CONVERTER (DAC)

The Photon supports DAC one A3 and A6 (DAC). There is no DAC on the Photon 2 or Gen 3 devices.

If you need a DAC, it's easy to add one via I2C or SPI on your base board.

Photon Pin Name	Photon DAC	Photon 2 Pin Name	Photon 2 DAC
A3	✓	D0 / A3	
DAC / A6	✓		

WKP (A7)

	Photon	Photon 2
Module Pin	30	30
Pin Name	WKP	WKP
	A7	D11
Analog Input	✓	
PWM	✓	

On Gen 2 devices (STM32), only the WKP pin can wake from HIBERNATE sleep mode.

This restriction does not exist on the Photon 2 and Gen 3 devices; any pin can be used to wake from all sleep modes.

CAN (CONTROLLER AREA NETWORK)

The Photon supports CAN on pins D1 and D2. There is no CAN on the Photon 2 or Gen 3 devices (except the Tracker).

- The Tracker SoM includes CAN via a MCP25625 CAN interface with integrated transceiver.
- Both the MCP2515 and MCP25625 work with the library used on the Tracker and can be used to add CAN to the Photon 2.

Photon Pin Name	Photon CAN	Photon 2 Pin Name	Photon 2 CAN
D1	✓	D1 / A4	
D2	✓	D2	

I2S (SOUND)

The Photon theoretically had I2S sound available on pins D1 and D2, however there has never been support for it in Device OS.

There is no software support for I2S on the Photon 2 either, and while the RTL872x hardware supports I2S, the pins that it requires are in use by other ports.

Photon Pin Name	Photon I2S	Photon 2 Pin Name	Photon 2 I2S
D2	I2S3_SD	D2	
D4	I2S3_SCK	D4	
D5	I2S3_WS	D5 / WKP	
SETUP	I2S3_MCK		

INTERRUPTS

There are many limitations for interrupts on the STM32F205. All pins can be used for interrupts on Gen 3 devices and the Photon 2.

RETAINED MEMORY

Retained memory, also referred to as Backup RAM or SRAM, that is preserved across device reset, is not available on the Photon 2. This also prevents system usage of retained memory, including session resumption on reset.

On Gen 2 and Gen 3 devices, retained memory is 3068 bytes.

The flash file system can be used for data storage on the Photon 2, however care must be taken to avoid excessive wear of the flash for frequently changing data.

USB

The Photon 2 has a USB C connector, like the Tracker One and Tracker Eval Board.

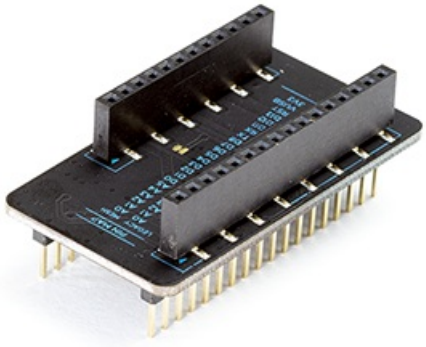
The Photon has a Micro USB B connector.

PHOTON BOTTOM

The Photon 2 has components on both sides of the board, like the Argon. It is not available without the mounted headers, and cannot be reflowed directly to a base board like the Photon without headers.

The Photon 2 does not have the solder pads for the RGB LED and SETUP/MODE button on the bottom. The RGB LED can be directed in software to other pins on the Photon 2. The SETUP/MODE button is available on the header pins on the Photon 2.

CLASSIC ADAPTER



The Particle classic adapter can be used to plug a Photon 2 into a socket that is intended to support an Electron. It can also fit in a Photon socket, however pins will hang past the socket, so there must not be anything in the way, or anything that would short the overhanging pins.

There are many pin limitations, and in particular the classic adapter does not work if you need to use SPI.

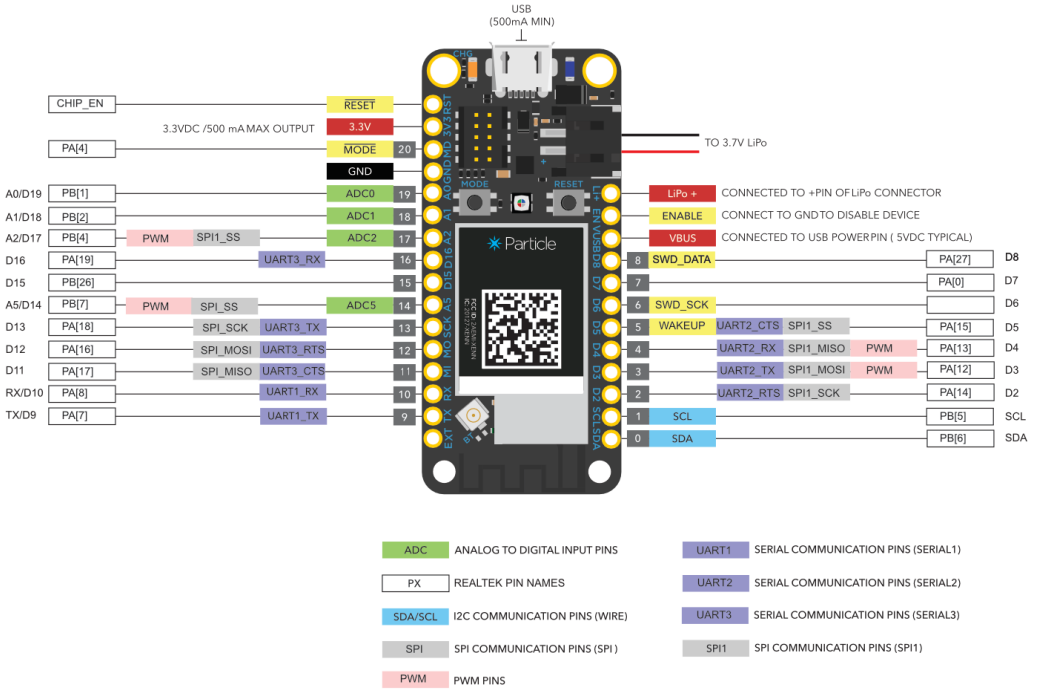
Pins B0 - B5 and C0 - C5 are not available if plugging into a Photon socket, as these pins are the pins that hang over the edge and exist only on the Electron, not the Photon

Electron Pin Name	Electron Description	Photon 2 Pin Name	Photon 2 Description

3V3	Regulated 3.3V DC output, maximum load 800 mA. Cannot be used as a power input.	3V3	Regulated 3.3V DC output, maximum load 500 mA
A0	A0 Analog in, GPIO	A0 / D19	A0 Analog in, GPIO
A1	A1 Analog in, GPIO	A1 / D18	A1 Analog in, GPIO
A2	A2 Analog in, GPIO, SPI SS	A2 / D17	A2 Analog in, GPIO, PWM.
A3	A3 True analog out, analog in, GPIO.	D16	D16 GPIO, Serial3 RX. Was A3 on Argon.
A4	A4 Analog in, GPIO, SPI MISO.	D15	D15 GPIO, Was A4 on Argon.
A5	A5 Analog in, GPIO, SPI MOSI.	A5 / D14	A5 Analog in, PWM, SPI SS, GPIO
B0	B0, GPIO, PWM		Not Connected
B1	B1, GPIO, PWM		Not Connected
B2	B2, analog in, GPIO, PWM		Not Connected
B3	B3, analog in, GPIO, PWM		Not Connected
B4	B4 Analog in, GPIO		Not Connected
B5	B5 Analog in, GPIO	MISO / D11	SPI MISO, D11 GPIO, Serial3 CTS
C0	Serial5 RX (received data), GPIO.		Not Connected
C1	Serial5 TX (trasmitted data), SPI2 MOSI, GPIO.		Not Connected
C2	Serial4 RX (received data), SPI2 MISO, GPIO.		Not Connected
C3	Serial4 TX (transmitted data), SPI2 SCK, GPIO.		Not Connected
C4	I2C, CAN TX, GPIO.		Not Connected
C5	I2C, CAN RX, GPIO.	D8	GPIO, PWM, SWDIO
D0	D0 GPIO, I2C SDA	D0 / A3	D0 GPIO, PWM, I2C SDA, A3 Analog In
D1	D0 GPIO, I2C SCL, CAN TX	D1 / A4	D1 GPIO, PWM, I2C SCL, A4 Analog In
D2	D2 GPIO, SPI1 MOSI, CAN RX	D2	D2 GPIO, Serial2 RTS, SPI1 SCK.
D3	D3 GPIO, SPI1 MISO	D3	D3 GPIO, PWM, Serial2 TX, SPI1 MOSI.
D4	D4 GPIO, SPI1 SCK	D4	D4 GPIO, PWM, Serial2 RX, SPI1 MISO.
D5	D5 GPIO, SPI1 SS	D5 / WKP	GPIO D5, Serial2 CTS, SPI1 SS.
D6	D6 GPIO, SWCLK	D6	D6 GPIO, SWCLK.
D7	D7 GPIO, Blue LED, SWDIO	D7	D7 GPIO. Blue LED.
DAC / A6	DAC/A6 True analog out, analog in, GPIO.	SCK / D13	SPI SCK, D13 GPIO, Serial3 TX
	Not Connected	EN	Power supply enable. Connect to GND to power down. Has internal weak (100K) pull-up.
GND	Ground. You only need to use one of the Photon ground pins.	GND	Ground.
	Not Connected	LI+	Connected to JST PH LiPo battery connector. 3.7V in or out.
	Not Connected	MODE	MODE button, has internal pull-up
RST	Hardware reset. Pull low to reset; can leave unconnected in normal operation.	RST	Hardware reset. Pull low to reset; can leave unconnected in normal operation.
RX	Serial1 RX (received data), GPIO, PWM.	RX / D10	Serial1 RX (received data), GPIO
TX	Serial1 TX (transmitted data), GPIO, PWM.	TX / D9	Serial1 TX (transmitted data), GPIO
VBAT	Battery for internal real-time clock, jumpered to 3V3.		Not Connected
VIN	Power in 3.9V to 12 VDC. Or power out (when powered by USB) 4.8 VDC at 1A maximum.	VUSB	Power out (when powered by USB) 5 VDC at 1A maximum. Power in with limitations.

WKP / A7	WKP/A7 Wakeup (active high), analog in, GPIO.	MOSI / D12	SPI MOSI, D12 GPIO, Serial3 RTS

FULL MODULE PIN COMPARISON



v0.8

3V3

	Photon	Photon 2
Pin Name	3V3	3V3
Description	Regulated 3.3V DC output, maximum load 100 mA. Or input 3.0V to 3.6V.	Regulated 3.3V DC output, maximum load 500 mA

A0

	Photon	Photon 2
Pin Name	A0	A0
Pin Alternate Name	n/a	D19
Description	A0 Analog in, GPIO	A0 Analog in, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Supports attachInterrupt	Yes. D2, A0, and A3 share the same interrupt handler.	Yes
Input is 5V Tolerant	Yes	No

A1

	Photon	Photon 2
Pin Name	A1	A1
Pin Alternate Name	n/a	D18
Description	A1 Analog in, GPIO	A1 Analog in, GPIO
Supports digitalRead	Yes	Yes

Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Supports attachInterrupt	Yes. D4 and A1 share the same interrupt handler.	Yes
Input is 5V Tolerant	Yes	No

A2

	Photon	Photon 2
Pin Name	A2	A2
Pin Alternate Name	n/a	D17
Description	A2 Analog in, GPIO, SPI SS	A2 Analog in, GPIO, PWM.
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Supports analogWrite (PWM)	No	Yes
Supports tone	No	Yes
SPI interface	SS. Use SPI object. This is only the default SS/CS pin, you can use any GPIO instead.	n/a
Supports attachInterrupt	Yes	Yes
Input is 5V Tolerant	Yes	No

A3

	Photon	Photon 2
Pin Name	A3	D0
Pin Alternate Name	n/a	A3
Description	A3 True analog out, analog in, GPIO.	D0 GPIO, PWM, I2C SDA, A3 Analog In
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Supports analogWrite (DAC)	Yes	No
Supports analogWrite (PWM)	No	Yes
Supports tone	No	Yes
SPI interface	SCK. Use SPI object.	n/a
I2C interface	n/a	SDA. Use Wire object. Use 1.5K to 10K external pull-up resistor.
Supports attachInterrupt	Yes. D2, A0, and A3 share the same interrupt handler.	Yes

A4

	Photon	Photon 2
Pin Name	A4	D1
Pin Alternate Name	n/a	A4
Description	A4 Analog in, GPIO, SPI.	D1 GPIO, PWM, I2C SCL, A4 Analog In

Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Supports analogWrite (PWM)	Yes. D3 and A4 share the same PWM channel and the PWM duty cycle is set for both.	Yes
Supports tone	Yes. D3 and A4 share the same PWM channel and only one frequency can be set for both.	Yes
SPI interface	MISO. Use SPI object.	n/a
I2C interface	n/a	SCL. Use Wire object. Use 1.5K to 10K external pull-up resistor.
Supports attachInterrupt	Yes. D1 and A4 share the same interrupt handler.	Yes
Input is 5V Tolerant	Yes	No

A5

	Photon	Photon 2
Pin Name	A5	A5
Pin Alternate Name	n/a	D14
Description	A5 Analog in, GPIO, SPI.	A5 Analog in, PWM, SPI SS, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Supports analogWrite (PWM)	Yes. D2 and A5 share the same PWM channel and the PWM duty cycle is set for both.	Yes
Supports tone	Yes. D2 and A5 share the same PWM channel and only one frequency can be set for both.	Yes
SPI interface	MOSI. Use SPI object.	SS. Use SPI object. Can use any GPIO for SS/CS.
Supports attachInterrupt	No	Yes
Input is 5V Tolerant	Yes	No

D0

	Photon	Photon 2
Pin Name	D0	D0
Pin Alternate Name	n/a	A3
Description	D0 GPIO, I2C	D0 GPIO, PWM, I2C SDA, A3 Analog In
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes

Supports analogRead	No	Yes
Supports analogWrite (PWM)	Yes	Yes
Supports tone	Yes	Yes
I2C interface	SDA. Use Wire object. Use 1.5K to 10K external pull-up resistor. Is 5V tolerant.	SDA. Use Wire object. Use 1.5K to 10K external pull-up resistor.
Supports attachInterrupt	No	Yes
Input is 5V Tolerant	Yes	No

D1

	Photon	**Photon 2**
Pin Name	D1	D1
Pin Alternate Name	n/a	A4
Description	D0 GPIO, I2C, CAN	D1 GPIO, PWM, I2C SCL, A4 Analog In
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	No	Yes
Supports analogWrite (PWM)	Yes	Yes
Supports tone	Yes	Yes
I2C interface	SCL. Use Wire object. Use 1.5K to 10K external pull-up resistor. Is 5V tolerant.	SCL. Use Wire object. Use 1.5K to 10K external pull-up resistor.
Supports attachInterrupt	Yes. D1 and A4 share the same interrupt handler.	Yes
CAN interface	CAN2_TX	n/a
Input is 5V Tolerant	Yes	No

D15

	Added to Photon 2
Pin Name	D15
Description	D15 GPIO, Was A4 on Argon.
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports attachInterrupt	Yes

D16

	Added to Photon 2
Pin Name	D16
Description	D16 GPIO, Serial3 RX. Was A3 on Argon.
Supports digitalRead	Yes
Supports digitalWrite	Yes

UART serial	RX. Use Serial3 object.
Supports attachInterrupt	Yes

D2

	Photon	Photon 2
Pin Name	D2	D2
Description	D2 GPIO, SPI1, CAN	D2 GPIO, Serial2 RTS, SPI1 SCK.
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	Yes. D2 and A5 share the same PWM channel and the PWM duty cycle is set for both.	No
Supports tone	Yes. D2 and A5 share the same PWM channel and only one frequency can be set for both.	No
UART serial	n/a	RTS. Use Serial2 object. Flow control optional.
SPI interface	MOSI. Use SPI1 object.	SCK. Use SPI1 object.
Supports attachInterrupt	Yes. D2, A0, and A3 share the same interrupt handler.	Yes
CAN interface	CAN2_RX	n/a
I2S interface	I2S3_SD	n/a
Input is 5V Tolerant	Yes	No

D3

	Photon	Photon 2
Pin Name	D3	D3
Description	D3 GPIO, SPI1	D3 GPIO, PWM, Serial2 TX, SPI1 MOSI.
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	Yes. D3 and A4 share the same PWM channel and the PWM duty cycle is set for both.	Yes
Supports tone	Yes. D3 and A4 share the same PWM channel and only one frequency can be set for both.	Yes
UART serial	n/a	TX. Use Serial2 object.
SPI interface	MISO. Use SPI1 object.	MOSI. Use SPI1 object.
Supports attachInterrupt	Yes. D3 and DAC/A6 share the same interrupt handler.	Yes
Input is 5V Tolerant	Yes	No
JTAG interface	JTAG RST. 40K pull-up at boot.	n/a

D4

	Photon	Photon 2
Pin Name	D4	D4

Description	D4 GPIO, SPI1	D4 GPIO, PWM, Serial2 RX, SPI1 MISO.
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	No	Yes
Supports tone	No	Yes
UART serial	n/a	RX. Use Serial2 object.
SPI interface	SCK. Use SPI1 object.	MISO. Use SPI1 object.
Supports attachInterrupt	Yes. D4 and A1 share the same interrupt handler.	Yes
I2S interface	I2S3_SCK	n/a
Input is 5V Tolerant	Yes	No
JTAG interface	JTAG TDO. Floating at boot.	n/a

D5

	Photon	Photon 2
Pin Name	D5	D5
Pin Alternate Name	n/a	WKP
Description	D5 GPIO, SPI1	GPIO D5, Serial2 CTS, SPI1 SS.
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
UART serial	n/a	CTS. Use Serial2 object. Flow control optional.
SPI interface	SS. Use SPI1 object. Can use any pin for SPI1 SS/CS however.	SS. Use SPI1 object. Can use any GPIO for SPI SS/CS.
Supports attachInterrupt	Yes	Yes
I2S interface	I2S3_WS	n/a
Input is 5V Tolerant	Yes	No
JTAG interface	JTAG TDI. 40K pull-up at boot.	n/a

D6

	Photon	Photon 2
Pin Name	D6	D6
Description	D6 GPIO	D6 GPIO, SWCLK.
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports attachInterrupt	Yes	Yes
Input is 5V Tolerant	Yes	No
JTAG interface	JTAG TCK. 40K pull-down at boot.	n/a
SWD interface	SWCLK. 40K pull-down at boot.	SWCLK. 40K pull-down at boot.

D7

	Photon	Photon 2
Pin Name	D7	D7

Description	D7 GPIO, Blue LED	D7 GPIO. Blue LED.
Supports digitalRead	Yes. But the on-board LED will light when 3.3V is supplied on this pin as well.	Yes
Supports digitalWrite	Yes. Note that this controls the on-board blue LED.	Yes
Supports attachInterrupt	Yes	Yes
JTAG interface	JTAG TMS. 40K pull-up at boot.	n/a
SWD interface	SWDIO. 40K pull-up at boot.	n/a

DAC

	Removed from Photon
Pin Name	DAC
Pin Alternate Name	A6
Description	DAC/A6 True analog out, analog in, GPIO.
Supports digitalRead	Yes
Supports digitalWrite	Yes
Supports analogRead	Yes
Supports analogWrite (DAC)	Yes
Supports attachInterrupt	Yes. D3 and DAC/A6 share the same interrupt handler.

EN

	Added to Photon 2
Pin Name	EN
Description	Power supply enable. Connect to GND to power down. Has internal weak (100K) pull-up.

GND

	Photon	**Photon 2**
Pin Name	GND	GND
Description	Ground. You only need to use one of the Photon ground pins.	Ground.

LI+

	Added to Photon 2
Pin Name	LI+
Description	Connected to JST PH LiPo battery connector. 3.7V in or out.

MISO

	Added to Photon 2
Pin Name	MISO
Pin Alternate Name	D11
Description	SPI MISO, D11 GPIO, Serial3 CTS
Supports digitalRead	Yes
Supports digitalWrite	Yes
UART serial	CTS. Use Serial3 object. Flow control optional.
SPI interface	MISO. Use SPI object.
Supports attachInterrupt	Yes

MODE

	Added to Photon 2
Pin Name	MODE
Description	MODE button, has internal pull-up

MOSI

	Added to Photon 2
Pin Name	MOSI
Pin Alternate Name	D12
Description	SPI MOSI, D12 GPIO, Serial3 RTS
Supports digitalRead	Yes
Supports digitalWrite	Yes
UART serial	RTS. Use Serial3 object. Flow control optional.
SPI interface	MOSI. Use SPI object.
Supports attachInterrupt	Yes

RGBB

	Removed from Photon
Pin Name	RGBB
Description	RGB LED Blue
UART serial	RX. Use Serial2 object.
Input is 5V Tolerant	No, if LED is connected.

RGBG

	Removed from Photon
Pin Name	RGBG
Description	RGB LED Green
UART serial	TX. Use Serial2 object.
Input is 5V Tolerant	No, if LED is connected.

RGBR

	Removed from Photon
Pin Name	RGBR
Description	RGB LED Red
Input is 5V Tolerant	No, if LED is connected.

RST

	Unchanged between Photon and Photon 2
Pin Name	RST
Description	Hardware reset. Pull low to reset; can leave unconnected in normal operation.

RX

	Photon	Photon 2
Pin Name	RX	RX
Pin Alternate Name	n/a	D10

Description	Serial1 RX (received data), GPIO, PWM.	Serial1 RX (received data), GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	Yes	No
Supports tone	Yes	No
UART serial	RX. Use Serial1 object.	RX. Use Serial1 object.
Supports attachInterrupt	Yes	Yes
Input is 5V Tolerant	Yes	No

SCK

	Added to Photon 2
Pin Name	SCK
Pin Alternate Name	D13
Description	SPI SCK, D13 GPIO, Serial3 TX
Supports digitalRead	Yes
Supports digitalWrite	Yes
UART serial	TX. Use Serial3 object.
SPI interface	SCK. Use SPI object.
Supports attachInterrupt	Yes

SETUP

	Removed from Photon
Pin Name	SETUP
Description	SETUP button, has internal pull-up. Pin number constant is BTN.
I2S interface	I2S3_MCK

TX

	Photon	**Photon 2**
Pin Name	TX	TX
Pin Alternate Name	n/a	D9
Description	Serial1 TX (transmitted data), GPIO, PWM.	Serial1 TX (transmitted data), GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	Yes	No
Supports tone	Yes	No
UART serial	TX. Use Serial1 object.	TX. Use Serial1 object.
Supports attachInterrupt	Yes	Yes
Input is 5V Tolerant	Yes	No

USBDATA-

	Removed from Photon
Pin Name	USBDATA-
Description	USB Data-
Input is 5V Tolerant	Yes

USBDATA+

	Removed from Photon
Pin Name	USBDATA+
Description	USB Data+
Input is 5V Tolerant	Yes

VBAT

	Removed from Photon
Pin Name	VBAT
Description	Battery for internal real-time clock, backup registers, and SRAM. Supply 1.65VDC to 3.6 VDC at 19 µA..

VIN

	Removed from Photon
Pin Name	VIN
Description	Power in 3.6V to 5.5 VDC. Or power out (when powered by USB) 4.8 VDC at 1A maximum.

VUSB

	Added to Photon 2
Pin Name	VUSB
Description	Power out (when powered by USB) 5 VDC at 1A maximum. Power in with limitations.
Input is 5V Tolerant	Yes

WKP

	Photon	Photon 2
Pin Name	WKP	D5
Pin Alternate Name	A7	WKP
Description	WKP/A7 Wakeup (active high), analog in, GPIO.	GPIO D5, Serial2 CTS, SPI1 SS.
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	n/a
Supports analogWrite (PWM)	Yes	No
Supports tone	Yes	No
UART serial	n/a	CTS. Use Serial2 object. Flow control optional.
SPI interface	n/a	SS. Use SPI1 object. Can use any GPIO for SPI SS/CS.
Supports attachInterrupt	Yes	Yes
Input is 5V Tolerant	Yes	No

Software

WI-FI CONFIGURATION

The Photon 2 and Argon utilize BLE for configuration of Wi-Fi rather than the SoftAP approach taken with the P1. Using BLE allow mobile apps to more easily set up the device Wi-Fi without having to modify the mobile device's network configuration.

Feature	Photon 2	Photon	Argon
Wi-Fi (SoftAP)		✓	
BLE	✓		✓

PLATFORM ID

The Platform ID of the Photon 2 will different from that of the Photon (6) because of the vastly different hardware.

If you have a product based on the Photon, you will need to create a separate product for devices using the Photon 2. While you may be able to use the same source code to build your application, the firmware binaries uploaded to the console will be different, so they need to be separate products. This generally does not affect billing as only the number of devices, not the number of products, is counted toward your plan limits.

THIRD-PARTY LIBRARIES

Most third-party libraries are believed to be compatible. The exceptions include:

- Libraries that use peripherals that are not present (such as DAC)
- Libraries for MCU-specific features (such as ADC DMA)
- Libraries that are hardcoded to support only certain platforms by their PLATFORM_ID

Version History

Revision	Date	Author	Comments
pre	2022-03-02	RK	Pre-release
	2022-03-14	RK	Minor edits; no functional changes