Argon Datasheet (v009)
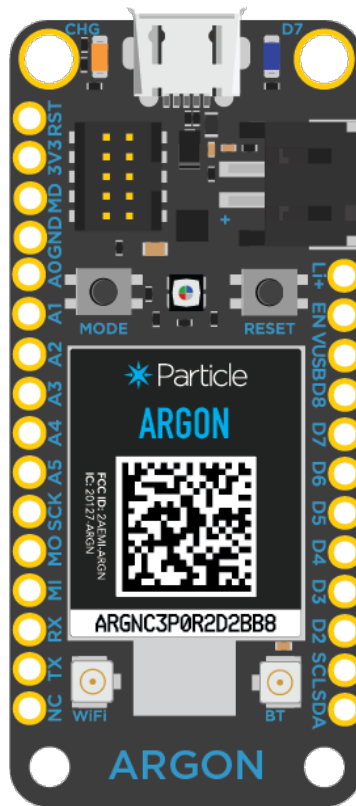
The Argon has been deprecated. The recommended replacement is the Photon 2.

See the Supply Secure FAQ for more information.

Functional description

OVERVIEW

The Argon is a powerful Wi-Fi enabled development board for Wi-Fi networks. It is based on the Nordic nRF52840 and has built-in battery charging circuitry so it's easy to connect a Li-Po and deploy your local network in minutes.

The Argon is great for connecting existing projects to the Particle Device Cloud over a Wi-Fi network.

FEATURES

- Espressif ESP32-D0WD 2.4 GHz Wi-Fi coprocessor
- On-board 4MB flash for ESP32
- 802.11 b/g/n support
- 802.11 n (2.4 GHz), up to 150 Mbps
- Nordic Semiconductor nRF52840 SoC
- ARM Cortex-M4F 32-bit processor @ 64MHz
- 1MB flash, 256KB RAM
- Bluetooth 5: 2 Mbps, 1 Mbps, 500 Kbps, 125 Kbps
- Supports DSP instructions, HW accelerated Floating Point Unit (FPU) and encryption functions
- Up to +8 dBm TX power (down to -20 dBm in 4 dB steps)
- NFC-A tag
- On-board additional 4MB SPI flash
- 20 mixed signal GPIO (6 x Analog, 8 x PWM), UART, I2C, SPI
- Micro USB 2.0 full speed (12 Mbps)
- Integrated Li-Po charging and battery connector
- JTAG (SWD) Connector
- RGB status LED
- Reset and Mode buttons
- On-board PCB antenna
- U.FL connector for external antenna
- Meets the Adafruit Feather specification in dimensions and pinout
- FCC, CE and IC certified
- RoHS compliant (lead-free)

Interfaces

BLOCK DIAGRAM

EN
VBUS
VUSB
LED CHRG STATUS
LiPo

POWER SELECTION LOGIC

XC9258A (3.3V REGULATOR)   3.3V

XC6802 (LiPo CHARGER)

CHRG STATUS — P0.12 / P1.09
LIPO VOLTAGE — P0.05

MX25L1606 (FLASH MEMORY)
CS — P0.17
MISO — P0.21
WP — P0.22
HOLD — P0.23
CLK — P0.19
MOSI — P0.20

RGB LED
RED — P0.13
GREEN — P0.14
BLUE — P0.15

MODE BUTTON — MODE — P0.11

RESET BUTTON — RESET

JTAG
SWDIO — SWDIO
SWDCLK — SWDCLK
SWD — P1.00
RESET — P0.18

USB
USB+
USB-
VUSB

u.FL
PCB ANTENNA

SKY13351-378LF (ANTENNA SWITCH)
P0.02
P0.25
ANT

(P0.25 = 0/P0.02 = 1) = PCB ANTENNA
(P0.25 = 1/P0.02 = 0) = EXTERNAL u.FL

NORDIC nRF52840

P1.04 — TXD
P1.05 — RXD
P1.07 — CTS
P1.06 — RTS
P0.16 — BOOT_MODE
P0.24 — WIFI_EN
P0.07 — HOST_WK

ESP32

CS — SDO — SWP — SHD — SD_CLK — SDI
MX25L3233 (FLASH MEMORY)

ANT — u.FL FOR WiFi ANTENNA

P0.18/RESET
3.3V
P0.11/MODE
GND
P0.03
P0.04
P0.28
P0.29
P0.30
P0.31
P1.15/SCK
P1.13/MOSI
P1.14/MISO
P0.08/RX
P0.06/TX

LiPo
EN
VBUS/VIN
P1.03
P1.12
P1.11
P1.10
P1.08
P1.02
P1.01
SCL/P0.27
SDA/P0.26

D7 — USER LED

P0.09 — NFC1
P0.10 — NFC2
u.FL FOR NFC ANTENNA

POWER

USB PORT

The USB port is the easiest way to power up the Argon. Please make sure that the USB port is able to provide at least 500mA. Power from the USB is regulated down to 3.3V by the on board Torex XC9258A step-down regulator.

VUSB PIN

The pin is internally connected to the VBUS of the USB port. The nominal output should be around 4.5 to 5 VDC when the device is plugged into the USB port and 0 when not connected to a USB source. You can use this pin to power peripherals that operate at such voltages. Do not exceed the current rating of the USB port, which is nominally rated to 500mA. This pin is also protected with an internal fuse rated at 1000mA.

LiPo

If you want to make your projects truly wireless, you can power the device with a single cell LiPo (3.7V). The Argon has an on board LiPo charger that will charge and power the device when USB source is plugged in or power the device from the LiPo alone in the absence of the USB.

NOTE: Please pay attention to the polarity of the LiPo connector. Not all LiPo batteries follow the same polarity convention!

Li+ PIN

This pin is internally connected to the positive terminal of the LiPo connector. You can connect a single cell LiPo/Lithium Ion or a DC supply source to this pin for powering the Argon. Remember that the input voltage range on this pin is 3.6 to 4.2 VDC.

3V3 PIN

This pin is the output of the on board 3.3V step-down switching regulator (Torex XC9258A). The regulator is rated at 1000mA max. When using this pin to power other devices or peripherals remember to budget in the current requirement of the Argon first. This pin can also be used to power the Argon in absence of the USB or LiPo power. When powering over this pin, please connect the ENABLE pin to GND so that the on board regulator is disabled.

EN PIN

The **EN** pin is not a power pin, per se, but it controls the 3V3 power. The EN pin is pulled high by a 100K resistor to the higher of VUSB, the micro USB connector, or Li+. Because the pull-up can result in voltages near 5V you should never directly connect EN to a 3.3V GPIO pin. Instead, you should only pull EN low, such as by using an N-channel MOSFET or other open-collector transistor.

The EN pin can force the device into a deep power-down state where it uses very little power. It also can used to assure that the device is completely reset, similar to unplugging it, with one caveat:

If using the EN pin to deeply reset the device, you must be careful not to allow leakage current back into the nRF52 MCU by GPIO or by pull-ups to 3V3. If you only power external devices by 3V3 you won't run into this, as 3V3 is de-powered when EN is low.

However, if you have circuitry that is powered by a separate, external power supply, you must be careful. An externally powered circuit that drives a nRF52 GPIO high when EN is low can provide enough current to keep the nRF52 from powering down and resetting. Likewise, a pull-up to an external power supply can do the same thing. Be sure that in no circumstances can power by supplied to the nRF52 when 3V3 is de-powered.

See the power supply schematic, below, for more information.

ANTENNA

There are two radios on the Argon. A BLE radio (nRF52840) and a WiFi radio (ESP32). For the WiFi radio, we have provided a u.FL connector to plug in the WiFi antenna. This is required if you wish to use the WiFi connectivity.

There are two options for the BLE antenna on the Argon. It comes with an on-board PCB antenna which is selected by default in the device OS and a u.FL connector if you wish to connect an external antenna. If you wish to use the external antenna, you'll need to issue an appropriate command in the firmware.

FCC APPROVED ANTENNAS

BLE and WiFi

The Argon includes one of these antennas, but a second for use with BLE can be purchased in the Particle online store.

Particle Device	Frequency	Antenna Type	Manufacturer	MFG. Part #	Gain
Argon	2400-2500 MHz	PCB Antenna	Particle	ANT-FLXV2	2.0dBi peak

It is also possible to use most antennas designed for Wi-Fi (2.4 GHz) as a BLE antenna. In some cases, a u.FL to RP-SMA adapter will be required. If you are building a product using alternative antennas, additional certification may be required.

PERIPHERALS AND GPIO

Peripheral Type	Qty	Input(I) / Output(O)
Digital	20	I/O
Analog (ADC)	6	I
UART	1	I/O
SPI	2	I/O
I2C	2	I/O
USB	1	I/O
PWM	8	O

Note: All GPIOs are only rated at 3.3VDC max.

SWD

The Argon has a dedicated 10 pin debug connector that exposes the SWD interface of the nRF5280. This interface can be used to debug your code or reprogram your Argon bootloader, device OS, or the user firmware using any standard SWD tools including our Gen 3 Debugger.

RESET

SWO

SWCLK

SWDIO

GND

GND

GND

3.3V

Memory map

NRF52840 FLASH LAYOUT OVERVIEW

- Bootloader (48KB, @0xF4000)
- User Application
    - 256KB @ 0xB4000 (Device OS 3.1 and later)
    - 128KB @ 0xD4000 (Device OS 3.0 and earlier)
- System (656KB, @0x30000)
- SoftDevice (192KB)

EXTERNAL SPI FLASH LAYOUT OVERVIEW (DFU OFFSET: 0X80000000)

- OTA (1500KB, @0x00289000)
- Reserved (420KB, @0x00220000)
- FAC (128KB, @0x00200000)
- LittleFS (2M, @0x00000000)

Pins and button definitions

1. USB
2. MODE BUTTON
3. RESET BUTTON
4. RGB STATUS LED
5. CHARGE STATUS LED
6. USER LED (ON D7)
7. LiPo BATT CONNECTOR
8. DEBUG CONNECTOR (SWD)
9. u.FL CONNECTOR FOR WiFi ANTENNA (REQUIRED)
10. u.FL CONNECTOR FOR EXTERNAL MESH ANTENNA (OPTIONAL)

1. u.FL CONNECTOR FOR NFC ANTENNA
2. ON-BOARD PCB ANTENNA FOR MESH
3. RF SHIELD

MICRO-B USB
(500mA MIN)

P0.18		RESET	
	3.3VDC /1000 mA MAX OUTPUT	3.3V	
P0.11		MODE	20
		GND	
P0.03	PWM 2	ADC0	19
P0.04	PWM 2	ADC1	18
P0.28	PWM 2	ADC2	17
P0.29	PWM 2	ADC3	16
P0.30	PWM 3	ADC4	15
P0.31	PWM 3	ADC5	14
P1.15	SPI_SCK		13
P1.13	SPI_MOSI		12
P1.14	SPI_MISO		11
P0.08	UART1_RX		10
P0.06	UART1_TX		9

TO 3.7V LiPo

LiPo +	CONNECTED TO +PIN OF LiPo CONNECTOR
ENABLE	CONNECT TO GND TO DISABLE DEVICE
VBUS	CONNECTED TO USB POWER PIN (5VDC TYPICAL)

Particle ARGON
ARGNC3P0R2D2BB8

8			PWM 1	P1.03
7			PWM 0	P1.12
6			PWM 1	P1.11
5			PWM 1	P1.10
4		SPI1_MISO	PWM 1	P1.08
3	SCL1	UART1_CTS SPI1_MOSI	PWM 3	P1.02
2	SDA1	UART1_RTS SPI1_SCK	PWM 3	P1.01
1	SCL			P0.27
0	SDA			P0.26

ARGON

PWM 0	GROUP 0 PWM PINS	ADC	ANALOG TO DIGITAL INPUT PINS	UART1	SERIAL COMMUNICATION PINS (SERIAL1)
PWM 1	GROUP 1 PWM PINS	SDA/SCL	I2C COMMUNICATION PINS (WIRE)	SDA1/SCL1	I2C COMMUNICATION PINS (WIRE1)
PWM 2	GROUP 2 PWM PINS	SPI	SPI COMMUNICATION PINS (SPI)	SPI1	SPI COMMUNICATION PINS (SPI1)
PWM 3	GROUP 3 PWM PINS	PX.XX	nRF52840 PIN NAMES		

v1.0

You can download a high resolution **PDF version of the pin out here.**

PIN DESCRIPTION

Pin	Description
Li+	This pin is internally connected to the positive terminal of the LiPo battery connector.
VUSB	This pin is internally connected to the USB (+ve) supply.
3V3	This pin is the output of the on-board 3.3V regulator.
GND	System ground pin.
EN	Device enable pin is internally pulled-up. To disable the device, connect this pin to GND.
RST	Active-low system reset input. This pin is internally pulled-up.
MD	This pin is internally connected to the MODE button. The MODE function is active-low.
RX	Primarily used as UART RX, but can also be used as a digital GPIO.
TX	Primarily used as UART TX, but can also be used as a digital GPIO.
SDA	Primarily used as data pin for I2C, but can also be used as a digital GPIO.
SCL	Primarily used as clock pin for I2C, but can also be used as a digital GPIO.
MO,MI,SCK	These are the SPI interface pins, but can also be used as a digital GPIO.
D2-D8	These are generic GPIO pins. D2-D8 are PWM-able.
A0-A5	These are analog input pins that can also act as standard digital GPIO. A0-A5 are PWM-able.

System RGB LED

For a detailed explanation of different color codes of the RGB system LED, please take a look here.

Charge status LED

State	Description
ON	Charging in progress
OFF	Charging complete

Technical specifications

ABSOLUTE MAXIMUM RATINGS [1]

Parameter	Symbol	Min	Typ	Max	Unit
Supply Input Voltage	V_{IN-MAX}			+6.2	V
Battery Input Voltage	V_{LiPo}			+6.5	V
Supply Output Current	$I_{3V3-MAX-L}$			1000	mA
Storage Temperature	T_{stg}	-30		+75	°C
ESD Susceptibility HBM (Human Body Mode)	V_{ESD}			2	kV

[1] Stresses beyond those listed under absolute maximum ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under recommended operating conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
LiPo Battery Voltage	V_{LiPo}	+3.3		+4.4	V
Supply Input Voltage	V_{3V3}	+3.0	+3.3	+3.6	V
Supply Output Voltage	V_{3V3}		+3.3		V
Operating Temperature	T_{op}	-20		+60	°C
Humidity Range Non condensing, relative humidity				95	%

POWER CONSUMPTION

Parameter	Symbol	Min	Typ	Peak	Unit
Operating Current (uC on, peripherals and radio disabled)	I_{idle}	3.1	3.52	3.58	mA
Operating Current (uC on, radio connected but idle)	$I_{wifi\_cloud\_idle}$	20.5	25.8	219	mA
Operating Current (uC on, radio connected and transmitting)	$I_{wifi\_cloud\_tx}$	20.1	31.7	261	mA
STOP mode sleep, GPIO wake-up	I_{stop_gpio}	350	396	459	uA
STOP mode sleep, analog wake-up	I_{stop_analog}	349	398	456	uA
STOP mode sleep, RTC wake-up	I_{stop_intrtc}	340	398	461	uA
STOP mode sleep, BLE wake-up, advertising	$I_{stop\_ble\_adv}$	340	442	3420	uA
STOP mode sleep, BLE wake-up, connected	$I_{stop\_ble\_conn}$	102	435	1970	uA
STOP mode sleep, serial wake-up	I_{stop_usart}	348	397	449	uA
STOP mode sleep, Wi-Fi wake-up	I_{stop_wifi}	15.3	22.2	110	mA
ULP mode sleep, GPIO wake-up	I_{ulp_gpio}		81.7	169	uA
ULP mode sleep, analog wake-up	I_{ulp_analog}		81.1	174	uA
ULP mode sleep, RTC wake-up	I_{ulp_intrtc}		80.7	168	uA
ULP mode sleep, BLE wake-up, advertising	$I_{ulp\_ble\_adv}$		141	3280	uA
ULP mode sleep, BLE wake-up, connected	$I_{ulp\_ble\_conn}$		138	1870	uA
ULP mode sleep, serial wake-up	I_{ulp_usart}	476	520	569	uA
ULP mode sleep, Wi-Fi wake-up	I_{ulp_wifi}	16.3	21.3	105	mA
HIBERNATE mode sleep, GPIO wake-up	I_{hib_gpio}		64.7	161	uA
HIBERNATE mode sleep, analog wake-up	I_{hib_analog}		65.0	159	uA
Power disabled (EN pin = LOW)	$I_{disable}$		20	30	uA

[1]The min, and particularly peak, values may consist of very short transients. The typical (typ) values are the best indicator of overall power consumption over time. The peak values indicate the absolute minimum capacity of the power supply necessary, not overall consumption.

RADIO SPECIFICATIONS

Argon has two radio modules.

Nordic Semiconductor nRF52840 SoC for BLE and NFC.

Feature	Description
Operating Frequencies	2360 to 2500 MHz
Output Power	Programmable -20dBm to +8dBm
PLL channel spacing	1 MHz
On the air data rate	125 to 2000 kbps

Espressif Systems ESP32 for WiFi

Feature	Description
WLAN Standards	IEEE 802 11b/g/n
Antenna Port	Single Antenna
Frequency Band	2412 to 2484 MHz

Note: Bluetooth features of the ESP32 are not exposed.

I/O CHARACTERISTICS

These specifications are based on the nRF52840 datasheet.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input high voltage	V_{IH}		0.7*3.3	--	3.3	V
Input low voltage	V_{IL}		0		0.3*3.3	V
Current at GND+0.4 V, output set low, high drive	$I_{OL,HDL}$	V_{3V3} >= 2.7V	6	10	15	mA
Current at V_{3V3}-0.4 V, output set high, high drive	$I_{OH,HDH}$	V_{3V3} >= 2.7V	6	9	14	mA
Current at GND+0.4 V, output set low, standard drive	$I_{OL,SD}$	V_{3V3} >= 2.7V	1	2	4	mA
Current at V_{3V3}-0.4 V, output set high, standard drive	$I_{OH,SD}$	V_{3V3} >= 2.7V	1	2	4	mA
Pull-up resistance	R_{PU}		11	13	16	kΩ
Pull-down resistance	R_{PD}		11	13	16	kΩ

GPIO default to standard drive (2mA) but can be reconfigured to high drive (9mA) in Device OS 2.0.0 and later using the `pinSetDriveStrength()` function.

Mechanical specifications
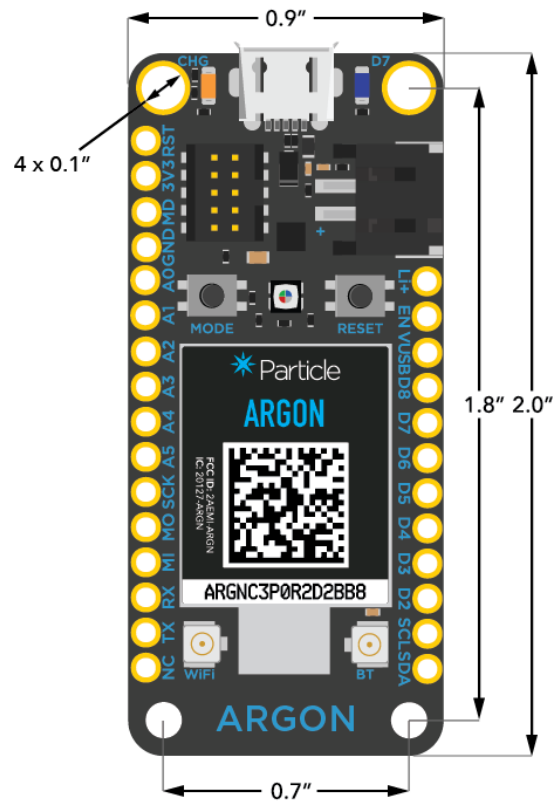
- Weight = 10 grams

MATING CONNECTORS

The Argon uses two single row 0.1" pitch male header pins. One of them is 16 pin while the other is 12 pin. It can be mounted with matching 0.1" pitch female headers with a typical height of 0.335" (8.5mm). When you search for parts like these it can be difficult to navigate the thousands of parts available online so here are a few good choices for the Argon:

Description	MFG	MFG Part Number
16-pin 0.1" (2.54mm) Female Header	Sullins	PPTC161LFBN-RC
16-pin 0.1" (2.54mm) Female Header	TE	6-535541-4
12-pin 0.1" (2.54mm) Female Header	Sullins	PPTC121LFBN-RC
12-pin 0.1" (2.54mm) Female Header	TE	6-534237-0

Recommended PCB land pattern

The Argon can be directly soldered onto the PCB or be mounted with the above mentioned female headers.
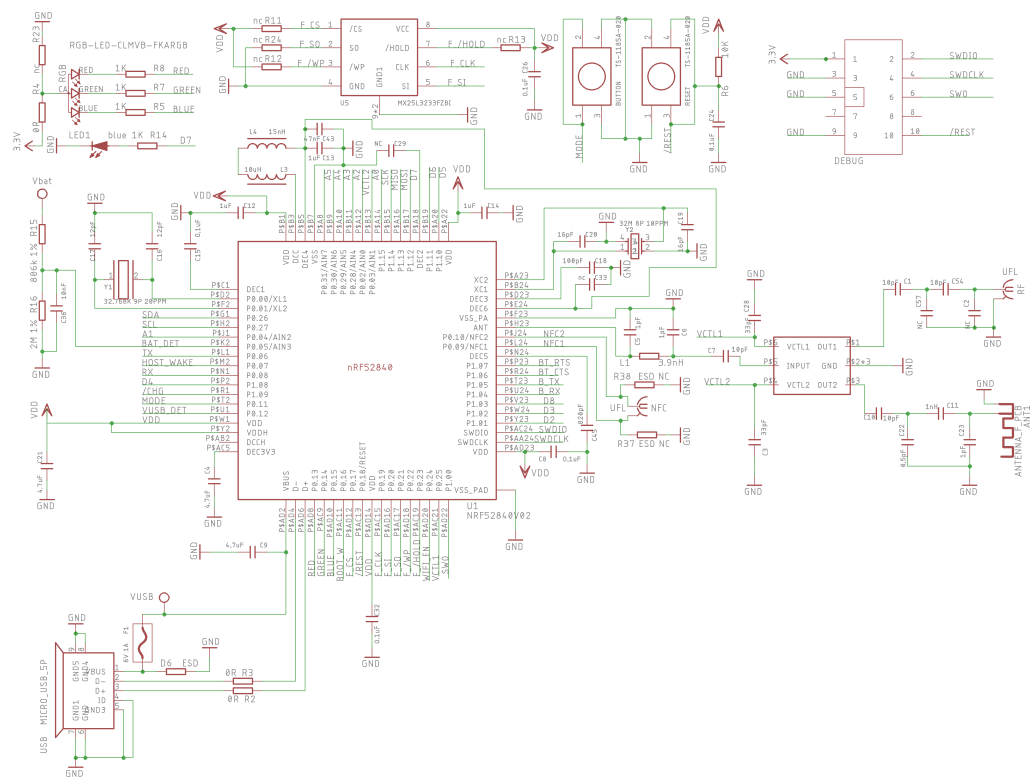
Schematic

The complete schematic and board files are open source and available on Particle's GitHub repository here.
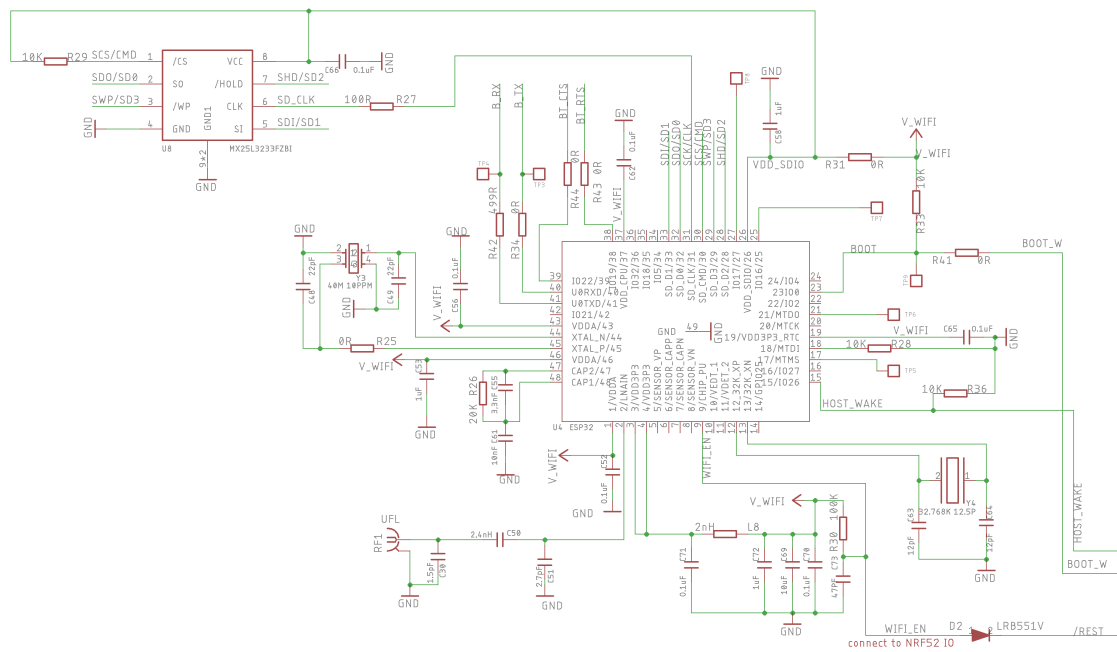
POWER

NRF52840

ESP32

10K R29 SCS/CMD 1 /CS   VCC 8
SDO/SD0 2 SO   /HOLD 7 SHD/SD2
SWP/SD3 3 /WP   CLK 6 SD_CLK 100R R27
4 GND   SI 5 SDI/SD1
GND
U8 9*2 MX25L3233FZBI
C60 0.1uF GND

B_RX B_TX BT_CTS BT_RTS GND
GND C68 1uF
SDI/SD1 SDO/SD0 SCK/CLK SCS/CMD SWP/SD3 SHD/SD2
VDD_SDIO R31 0R V_WIFI V_WIFI
C58 0.1uF
0R 0R R43 V_WIFI R35 10K
R44 R42 4.99R R34 0R
39 IO22/3 IO19/38 37 VDD_CPU 24 IO4
38 35 IO32/36 SD_D1/33 23 IO0
U0RXD/41 36 IO5/34 SD_D0/32 22 IO2
40 IO25/35 SD_CLK/31 21 MTDO BOOT R41 0R BOOT_W
U0TXD/40 34 SD_CMD/30 20 MTCK
42 IO21/42 SD_D3/29 V_WIFI
43 VDDA/43 SD_D2/28 19 VDD3P3_RTC 18 MTDI
44 XTAL_N/44 IO17/27 17 MTMS
45 XTAL_P/45 VDD_SDIO/26 16 IO27
46 VDDA/46 IO16/25 15 IO26
47 CAP2/47
48 CAP1/48
GND 49
22pF C47 40M 10PPM 22pF C49
GND GND C56 0.1uF V_WIFI
0R R25 V_WIFI C53 1uF
20K R26 3.3nF C55
10nF C61 GND

UFL
RF1 2.4nH C50 2nH L8 V_WIFI
1.5pF C30 2.7pF C51 0.1uF C52 0.1uF C71 1uF C72 10pF C59 C70 C73 R30 100K
GND GND GND GND 4.7PF
120pF C63 32.768K 12.5P Y4 22pF C54
WIFI_EN D2 LRB551V /REST
connect to NRF52 IO

HOST_WAKE 10K R28 C65 0.1uF GND
10K R36
HOST_WAKE BOOT_W

U4 ESP32

Ordering information

Argon are available from store.particle.io in single quantities.

SKU	Description	Region	Lifecycle	Replacement
ARG-AQKT	Argon Air Quality Monitor Kit [x1]	Global	GA	
ARG-STRTKT	Argon Starter Kit [x1]	Global	GA	
ARGN-H	Argon [x1]	Global	GA	
ARGNKIT	Argon, Starter Kit [x1]	Global	GA	
ARGNTRAY50	Argon, Tray [x50]	Global	Deprecated	
ARG-LDKT	Argon Leak Detection Kit [x1]	Global	End of life	

Qualification and approvals

- Model Number: ARGN
- RoHS
- CE
- FCC ID: 2AEMI-ARGN
- IC: 20127-ARGN

Product Handling

The Argon contains highly sensitive electronic circuitry and is an Electrostatic Sensitive Device (ESD). Handling Argon without proper ESD protection may destroy or damage it permanently. Proper ESD handling and packaging procedures must be applied throughout the processing, handling and operation of any application that incorporates Argon. ESD precautions should be implemented on the application board where the Argon is mounted. Failure to observe these precautions can result in severe damage to the Argon!

There are four connectors on the Argon that will get damaged with improper usage. The JST connector on the circuit board, where you plug in the LiPo battery, is very durable but the connector on the battery itself is not. When unplugging the battery, take extra precaution to **NOT** pull the connector using the wires, but instead hold the plug at its base to avoid putting stress on the wires. This can be tricky with bare hands - needle nose pliers are your friend here.

The micro B USB connector on the Argon is soldered on the PCB with large surface pads as well as couple of through hole anchor points. Despite this reinforcement, it is very easy to rip out the connector if too much stress is put on in the vertical direction.

The U.FL antenna connector is not designed to be constantly plugged and unplugged. The antenna pin is static sensitive and you can destroy the radio with improper handling. A tiny dab of

glue (epoxy, rubber cement, liquid tape or hot glue) on the connector can be used to securely hold the plug in place.

The 10 pin SWD connector provides an easy in-system debugging access to the device. The pins on the connector can easily be damaged if the mating connector cable is inserted improperly. If you are trying to debug the device, you probably are already not in a good mood. The last thing you want is to render the connector useless. Be nice and be gentle with the connector. Good luck with the debugging!

BREADBOARDING

The breadboard provided with the Argon is specifically designed to require low insertion force. This makes it easy to plug the Argon in and out of the breadboard. If you end up using a different breadboard, remember that it may require more force. In this case, always remember to pinch-hold your precious Argon by the sides (along the header pins) when plugging-unplugging and not by the USB connector (don't be this person).

Default settings

The Argon comes preprogrammed with a bootloader and a user application called Tinker. This application works with an iOS and Android app also named Tinker that allows you to very easily toggle digital pins, take analog and digital readings and drive variable PWM outputs.

The bootloader allows you to easily update the user application via several different methods, USB, OTA, Serial Y-Modem, and also internally via the Factory Reset procedure. All of these methods have multiple tools associated with them as well.

FCC IC CE Warnings and End Product Labeling Requirements

Federal Communication Commission Interference Statement This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter. This End equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling The final end product must be labeled in a visible area with the following:

- Contains FCC ID: 2AEMI-ARGN

Manual Information to the End User The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

Canada Statement This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage;
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Caution Exposure: This device meets the exemption from the routine evaluation limits in section 2.5 of RSS102 and users can obtain Canadian information on RF exposure and compliance. Le dispositif répond à l'exemption des limites d'évaluation de routine dans la section 2.5 de RSS102 et les utilisateurs peuvent obtenir des renseignements canadiens sur l'exposition aux RF et le respect.

The final end product must be labelled in a visible area with the following: The Industry Canada certification label of a module shall be clearly visible at all times when installed in the host device, otherwise the host device must be labelled to display the Industry Canada certification number of the module, preceded by the words "Contains transmitter module", or the word "Contains", or similar wording expressing the same meaning, as follows:

- Contains transmitter module IC: 20127-ARGN

This End equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.

The end user manual shall include all required regulatory information/warning as shown in this manual.

Revision history

Revision	Date	Author	Comments
v001	2018 Oct 26	MB	Initial release
v002	2020 Jan 21	RK	Remove mesh
v003	2020 Sep 01	RK	Add EN pin information
v004	16-Sep-2020	RK	Added power consumption information
v005	15-Mar-2021	RK	Updated ordering information
v006	28-Jun-2021	RK	Added Device OS 3.1 memory map information
v007	28-Jul-2021	RK	Corrected number of SPI ports (2) in peripherals and GPIO
v008	10-Sep-2021	RK	Changed wording of peak vs. max current
v009	14-Mar-2022	RK	Added deprecation notice

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Known Errata

Contact

Web

https://www.particle.io

Community Forums

https://community.particle.io

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https://support.particle.io