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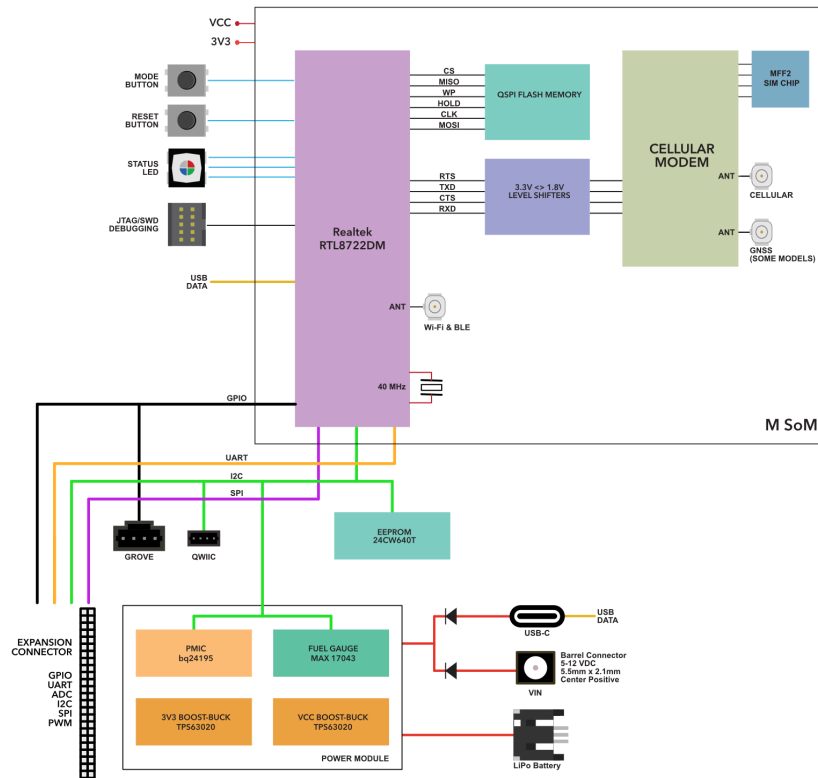
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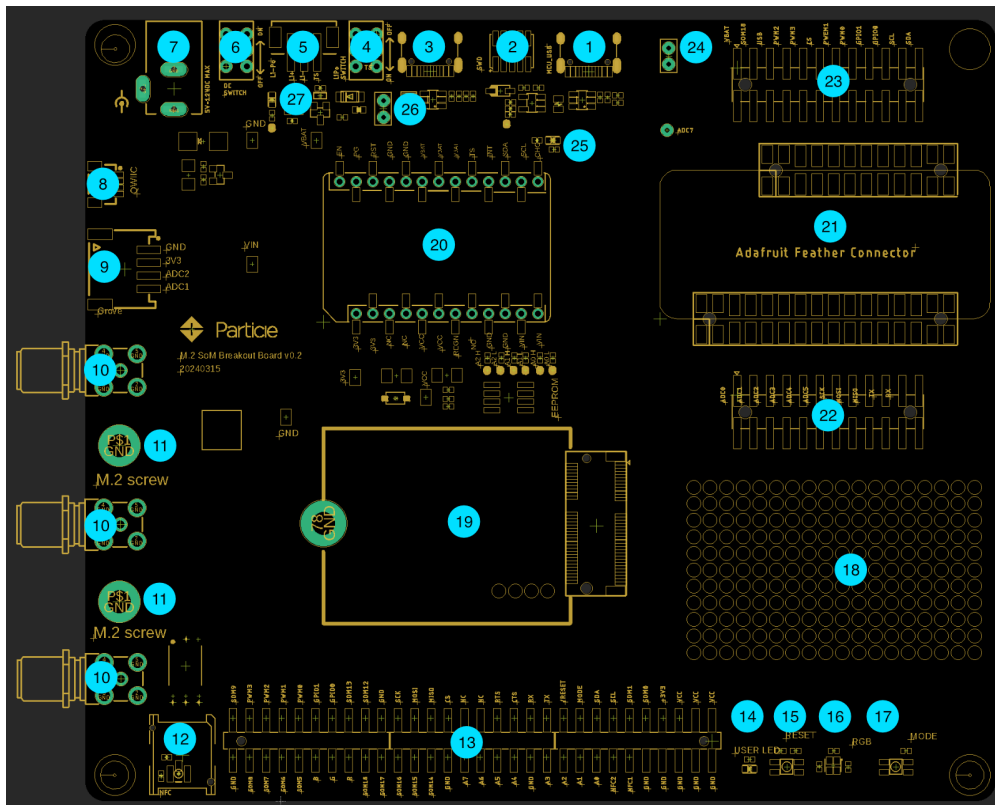
This is a preliminary datasheet based on pre-release version of the hardware. Changes are expected.

The M.2 breakout board is a convenient way to prototype with the B-SoM and M-SoM modules.

# Block diagram



# Board features



## Label Description

1	MCU USB-C (use this one)
2	SWD debugging connector
3	Cellular modem USB-C (not normally used)
4	LiPo battery power switch
5	LiPo battery connector (3-pin, with temperature sensor)
6	DC power switch
7	DC power barrel connector, 5-12 VDC (5.5mm x 2.1mm, center positive)
8	QWIIC (3.3V I2C connector)
9	Grove expansion connector
10	U.FL to SMA connectors
11	Spare M.2 SoM screws
12	NFC U.FL connector (B-SoM only, not available on M-SoM)
13	Expansion connector
14	D7 User LED (blue)
15	RESET button
16	RGB status LED
17	MODE button
18	Prototyping area
19	M.2 SoM socket for B-SoM or M-SoM
20	Power module
21	Adafruit Feather connector (for accessories)
22	Feather connector jumpers
23	Feather connector jumpers
24	VUSB jumper (only used on B-SoM)

25	LiPo charge LED (yellow)
26	LiPo temperature sensor bypass jumper (TS)
27	Power LED (red)
28	Power LED disable (cut trace to disable, can reenable with solder)

## POWERING THE BOARD

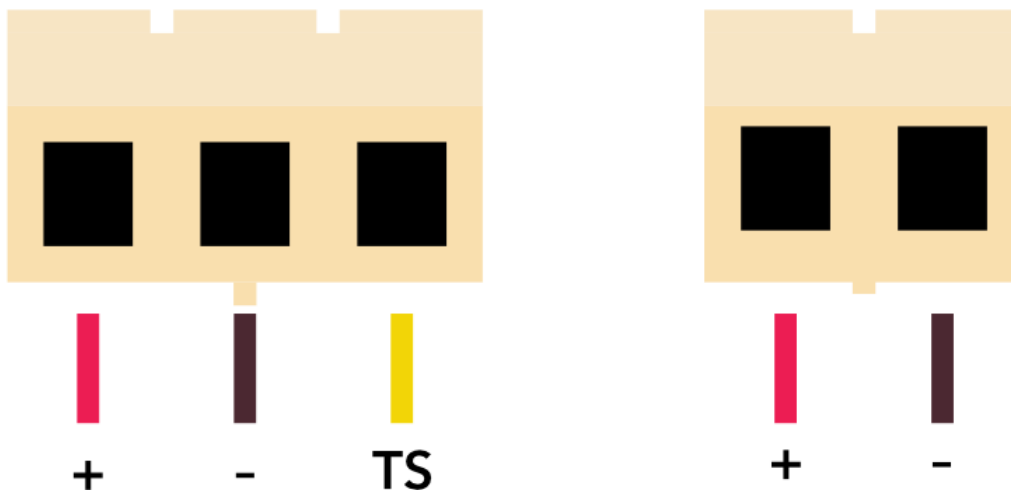
The M.2 breakout can be powered by:

Num	Description
1	USB-C ("MCU USB")
5	LiPo battery (3.7V LiPo with 3-pin JST-PH connector)
7	VIN barrel connector 5-12 VDC (5.5mm x 2.1mm, center positive)

- There are two USB C connectors on the breakout board, be sure to use connector 1 "MCU USB".
- When powering by VIN (barrel connector), 5-12 VDC is recommended, but up to 17 VDC can be supplied.
- Minimum power requirements are 5VDC @500mA (when the LiPo battery) or 5VDC @2000mA (without LiPo battery).
- If purchasing a LiPo battery from a 3rd-party supplier, beware as the polarity of the JST-PH connector is not standardized and may be reversed. Permanent damage to the breakout board can occur if powered by reverse polarity on the JST connector. See the [battery guide](#) for additional information.

### LiPo connector

Note that the M.2 breakout board includes a 3-pin JST-PH connector (left), not the 2-pin JST-PH connector on some other Particle devices (right). The TS pin is expected to be connected to a 10K NTC thermistor in the battery pack.



Looking at the exposed end of the connector attached to the battery

# Setup

The basic setup for the B-SoM or M-SoM to be operational is shown below:

- Plug the cellular antenna into the U.FL connector labeled **CELL** on the SoM. Remember never to power up this board without the antenna being connected. There is potential to damage the transmitter of the u-blox module if no antenna is connected.
- If you are going to use BLE, connect the 2.4 GHz antenna (the smaller one) to the **BT** U.FL connector on the SoM.
- Connect power the USB (1) or a LiPo battery (2).
- Turn on the appropriate power switches (4, 6).

## Onboard peripherals

**QWIIC (8)**

The SparkFun Qwiic system provides an easy way to expand and test various sensors, input devices, and displays. Multiple peripherals can be daisy-chained to a single port. The Adafruit Stemma QT are compatible with Qwiic and can be mixed and matched as well.

For more information, see [Qwiic](#).

## GROVE CONNECTOR (9)

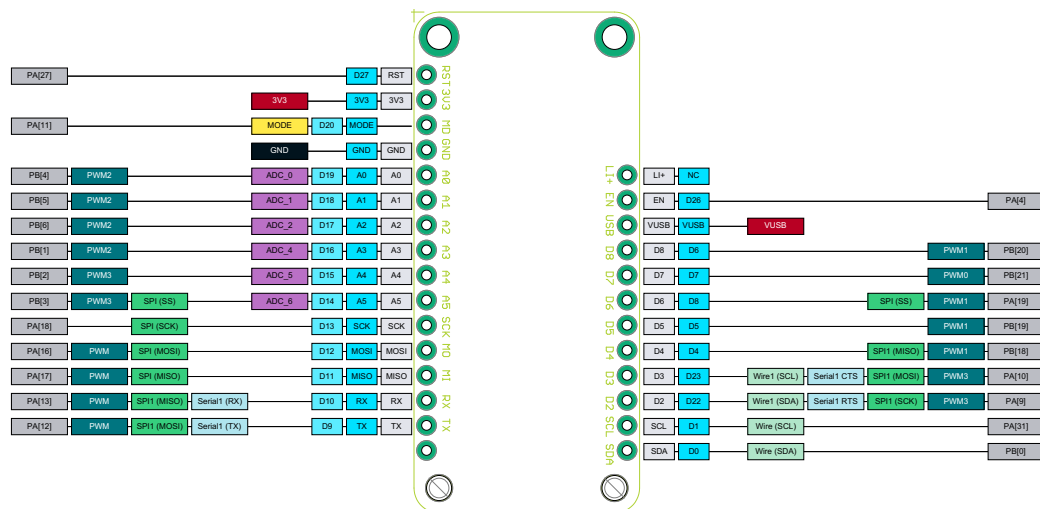
Additionally, Grove system of sensors and peripherals from Seeed Systems is another easy way to add peripheral devices. The M.2 breakout board has one Grove connectors connected to pins A1 and A2 that can be used as GPIO or analog inputs. This port cannot be used with I2C or Serial Grove peripherals.

J11	SoM Pin	SoM Pin Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463
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## FEATHER CONNECTOR (21)

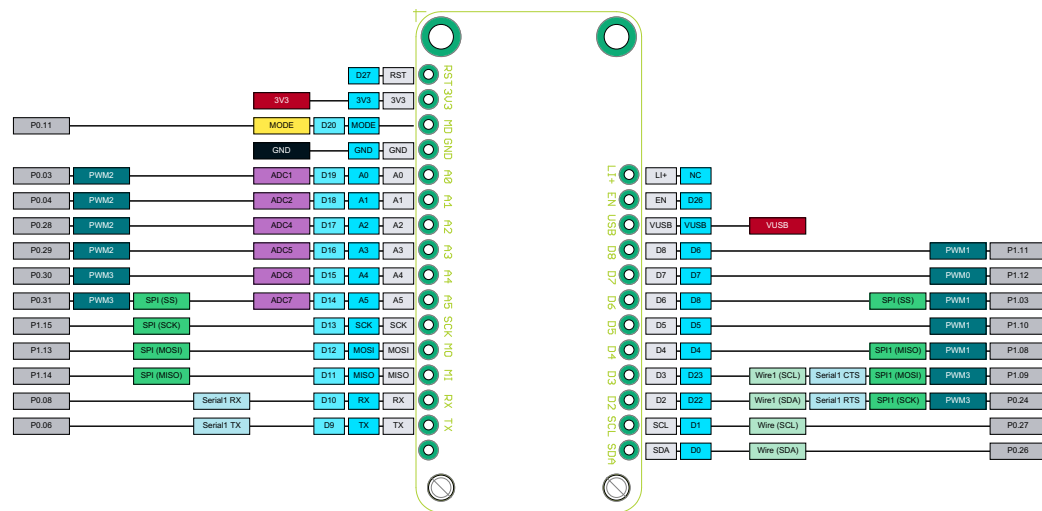
The Feather connector can be used for Adafruit FeatherWings, such as displays, sensors, and Ethernet. You cannot plug a Feather MCU into this socket!

## FEATHER PIN MAPPING - M-SOM



## FEATHER PIN MAPPING - B-SOM





## JUMPERS (22)

These jumpers connect the Feather A pin side to the M.2 connector. They can also be used to remap pins by using jumper wires instead of solid jumpers.

## JUMPERS (23)

These jumpers connect the Feather D pin side to the M.2 connector. They can also be used to remap pins by using jumper wires instead of solid jumpers.

## POWER MODULE

The M.2 breakout board comes with the [PMIC power module](#) that includes the bq24195 PMIC and MAX17043 fuel gauge chips.

The following pins are used by the power module.

Power module	SoM Pin	SoM Pin Number
FUEL_INT	A6	45
SDA	D0	22
SCL	D1	20
Power enable	D23 / GPIO1	50
Power status	D4 / PWM0	52

## USING ETHERNET

The M.2 breakout board does not contain Ethernet like the previous B-Series Eval board. You can, however, add it using the [Adafruit Ethernet FeatherWing](#) in the Feather socket.

Be sure to connect the nRESET and nINTERRUPT pins (on the small header on the short side) to pins D3 and D4 with jumper wires. These are required for proper operation.

The default mapping for the B-SoM and the original B-SoM eval board is listed below, but you may want to use [Ethernet pin remapping](#) to reassign the pins.

Particle Pin	M.2 Pin	Ethernet Pin
D8	CS	ETH_CS

A7	RESERVED	ETH_RESET
SCK	SCK	ETH_CLK
MISO	MISO	ETH_MISO
MOSI	MOSI	ETH_MOSI
D22	GPIO0	ETH_INT

## USING SD CARD

---

The M.2 breakout board does not contain a Micro SD card socket as the previous B-Series Eval board did. You can, however, add it using the Adafruit Feather connector.

The [Adalogger FeatherWing - RTC + SD Add-on For All Feather Boards](#) contains a Micro SD card socket.

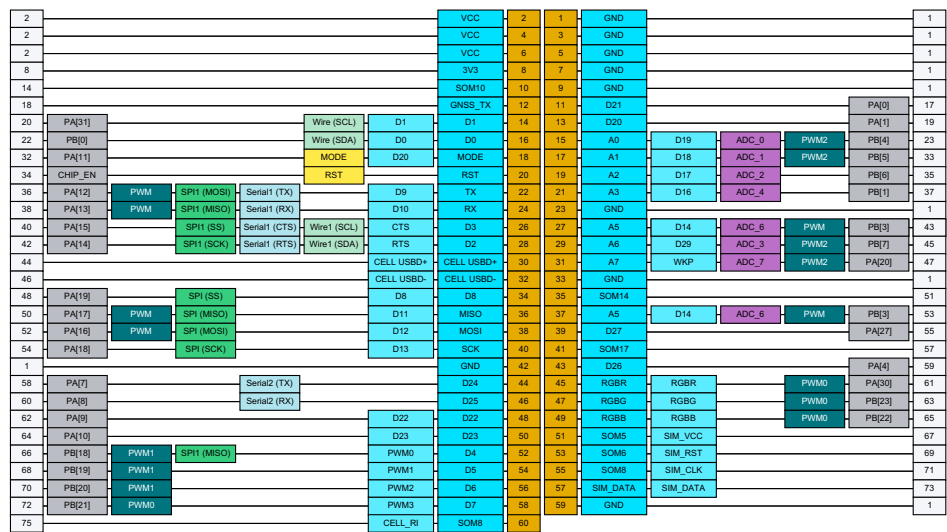
SD Card Pin	Feather Pin	Description
SCK	SCK	SPI Clock
MOSI	MOSI	Data (MCU to SD card)
MISO	MISO	Data (SD card to MCU)
SDCS	D5	Chip select

It is also possible to cut the a trace jumper for SDCS and use a different pin for SDCS. Note that this will use `SPI` (primary SPI) but the B-Series Eval board use `SPI1` so your SD card initialization code will be different.

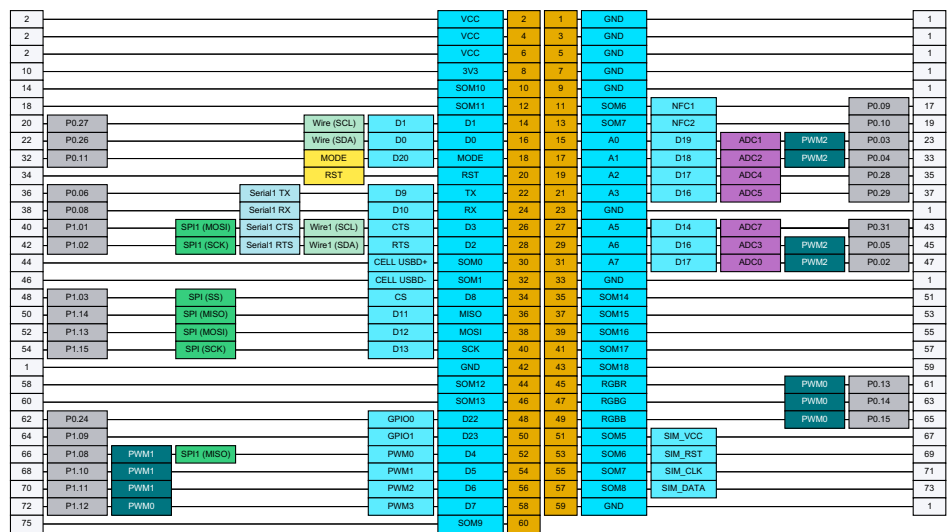
See the [Adafruit tutorial](#) for additional information.

# Expansion header

## EXPANSION HEADER - M-SOM



## EXPANSION HEADER - B-SOM



## FULL PIN LISTING

[Skip past this section](#) (the full pin listing is long)

### Module Pin 1 (GND)

Unchanged between B-SoM and M-SoM

Pin Number 1

Pin Name GND

Description	Ground.
-------------	---------

#### Module Pin 2 (VCC)

##### Unchanged between B-SoM and M-SoM

Pin Number	2
Pin Name	VCC
Description	Cellular modem power. Typically 3.9V, can be 3.6V to 4.2V

#### Module Pin 3 (GND)

##### Unchanged between B-SoM and M-SoM

Pin Number	3
Pin Name	GND
Description	Ground.

#### Module Pin 4 (VCC)

##### Unchanged between B-SoM and M-SoM

Pin Number	4
Pin Name	VCC
Description	Cellular modem power. Typically 3.9V, can be 3.6V to 4.2V

#### Module Pin 5 (GND)

##### Unchanged between B-SoM and M-SoM

Pin Number	5
Pin Name	GND
Description	Ground.

#### Module Pin 6 (VCC)

##### Unchanged between B-SoM and M-SoM

Pin Number	6
Pin Name	VCC
Description	Cellular modem power. Typically 3.9V, can be 3.6V to 4.2V

#### Module Pin 7 (GND)

##### Unchanged between B-SoM and M-SoM

Pin Number	7
Pin Name	GND
Description	Ground.

#### Module Pin 8 (3V3)

##### Unchanged between B-SoM and M-SoM

Pin Number	8
Pin Name	3V3
Description	3.3V used to power MCU

#### Module Pin 9 (GND)

**Unchanged between B-SoM and M-SoM**

Pin Number	9
Pin Name	GND
Description	Ground.

**Module Pin 10 (SOM10)****Unchanged between B-SoM and M-SoM**

Pin Number	10
Pin Name	SOM10
Description	Not currently used, leave unconnected.

**Module Pin 11 (SOM6 / D21)**

	B-SoM	M-SoM
Pin Number	11	11
Δ Pin Name	SOM6	D21
Δ Pin Alternate Name	NFC1	n/a
Δ Description	NFC Antenna 1.	D21 GPIO. Is NFC1 on B-SoM.
Δ Supports digitalRead	n/a	Yes
Δ Supports digitalWrite	n/a	Yes
Δ Supports attachInterrupt	n/a	Yes
Δ Internal pull resistance	n/a	22K. No internal pull up or pull down in HIBERNATE sleep mode.

**Module Pin 12 (SOM11 / GNSS\_TX)**

	B-SoM	M-SoM
Pin Number	12	12
Δ Pin Name	SOM11	GNSS_TX
Δ Description	Not currently used, leave unconnected.	Cellular modem GNSS UART TX

**Module Pin 13 (SOM7 / D20)**

	B-SoM	M-SoM
Pin Number	13	13
Δ Pin Name	SOM7	D20
Δ Pin Alternate Name	NFC2	n/a
Δ Description	NFC Antenna 2. NFC2 is the center pin.	D20 GPIO. Is NFC2 on B-SoM.
Δ Supports digitalRead	n/a	Yes
Δ Supports digitalWrite	n/a	Yes
Δ Supports attachInterrupt	n/a	Yes
Δ Internal pull resistance	n/a	???

**Module Pin 14 (D1)**

	B-SoM	M-SoM
Pin Number	14	14
Pin Name	D1	D1
Pin Alternate Name	D1	D1
Description	I2C SCL. Cannot be used as GPIO.	I2C SCL. Cannot be used as GPIO.

	Supports digitalRead	Yes	Yes
	Supports digitalWrite	Yes	Yes
Δ	I2C interface	SCL. Use Wire object.	SCL. Use Wire object. Use 1.5K to 10K external pull-up resistor.
Δ	Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ	Internal pull resistance	13K	???

### Module Pin 15 (A0)

	B-SoM	M-SoM
	Pin Number	15
	Pin Name	A0
	Pin Alternate Name	D19
	Description	A0 Analog in, GPIO, PWM
	Supports digitalRead	Yes
	Supports digitalWrite	Yes
	Supports analogRead	Yes
	Supports analogWrite (PWM)	Yes
Δ	Supports tone	A0, A1, A6, and A7 must have the same frequency. Yes
Δ	Supports attachInterrupt	Yes. You can only have 8 active interrupt pins. Yes
Δ	Internal pull resistance	13K 42K

### Module Pin 16 (D0)

	B-SoM	M-SoM
	Pin Number	16
	Pin Name	D0
	Pin Alternate Name	D0
	Description	I2C SDA. Cannot be used as GPIO. I2C SDA. Cannot be used as GPIO.
	Supports digitalRead	Yes
	Supports digitalWrite	Yes
Δ	I2C interface	SDA. Use Wire object. SDA. Use Wire object. Use 1.5K to 10K external pull-up resistor.
Δ	Supports attachInterrupt	Yes. You can only have 8 active interrupt pins. Yes
Δ	Internal pull resistance	13K ???

### Module Pin 17 (A1)

	B-SoM	M-SoM
	Pin Number	17
	Pin Name	A1
	Pin Alternate Name	D18
	Description	A1 Analog in, GPIO, PWM
	Supports digitalRead	Yes

Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Supports analogWrite (PWM)	Yes	Yes
Δ Supports tone	A0, A1, A6, and A7 must have the same frequency.	Yes
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	???

### Module Pin 18 (MODE)

	B-SoM	M-SoM
Pin Number	18	18
Pin Name	MODE	MODE
Pin Alternate Name	D20	D20
Δ Description	MODE button, has internal pull-up	MODE button. Pin number constant is BTN. External pull-up required!
Δ Supports attachInterrupt	n/a	Yes

### Module Pin 19 (A2)

	B-SoM	M-SoM
Pin Number	19	19
Pin Name	A2	A2
Pin Alternate Name	D17	D17
Description	A2 Analog in, GPIO	A2 Analog in, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	22K

### Module Pin 20 (RST)

	B-SoM	M-SoM
Pin Number	20	20
Pin Name	RST	RST
Δ Description	Hardware reset, active low.	Hardware reset, active low. External pull-up required.

### Module Pin 21 (A3)

	B-SoM	M-SoM
Pin Number	21	21
Pin Name	A3	A3
Pin Alternate Name	D16	D16
Description	A3 Analog in, GPIO	A3 Analog in, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	2.1K

Module Pin 22 (TX)

	B-SoM	M-SoM
Pin Number	22	22
Pin Name	TX	TX
Pin Alternate Name	D9	D9
Δ Description	Serial TX, GPIO	Serial TX, PWM, GPIO, SPI1 MOSI
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Δ Supports analogWrite (PWM)	No	Yes
Δ Supports tone	No	Yes
UART serial	TX. Use Serial1 object.	TX. Use Serial1 object.
Δ SPI interface	n/a	MOSI. Use SPI1 object.
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	2.1K

Module Pin 23 (GND)

Unchanged between B-SoM and M-SoM	
Pin Number	23
Pin Name	GND
Description	Ground.

Module Pin 24 (RX)

	B-SoM	M-SoM
Pin Number	24	24
Pin Name	RX	RX
Pin Alternate Name	D10	D10
Δ Description	Serial RX, GPIO	Serial RX, PWM, GPIO, SPI1 MISO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Δ Supports analogWrite (PWM)	No	Yes
Δ Supports tone	No	Yes
UART serial	RX. Use Serial1 object.	RX. Use Serial1 object.
Δ SPI interface	n/a	MISO. Use SPI1 object.
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	2.1K

Module Pin 25 (A4)

	B-SoM	M-SoM
Pin Number	25	25
Pin Name	A4	A4
Pin Alternate Name	D15	D15
Description	A4 Analog in, GPIO	A4 Analog in, GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes



Supports analogRead	Yes	Yes
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	2.1K

### Module Pin 26 (D3)

	B-SoM	M-SoM
Pin Number	26	26
Pin Name	D3	D3
Pin Alternate Name	CTS	CTS
Δ Description	SPI1 MOSI, Serial1 CTS, GPIO, Wire1 SCL	D3 GPIO, Serial1 CTS flow control (optional), SPI1 SS
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
UART serial	CTS. Use Serial1 object.	CTS. Use Serial1 object.
Δ SPI interface	MOSI. Use SPI1 object.	SS. Use SPI1 object.
I2C interface	SCL. Use Wire1 object.	SCL. Use Wire1 object.
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	???

### Module Pin 27 (A5)

	B-SoM	M-SoM
Pin Number	27	27
Pin Name	A5	A5
Pin Alternate Name	D14	D14
Δ Description	A5 Analog in, GPIO	A5 Analog in, PWM, GPIO, shared with pin 53
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogRead	Yes	Yes
Δ Supports analogWrite (PWM)	No	Yes
Δ Supports tone	No	Yes
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	???
Δ SWD interface	n/a	SWCLK. 40K pull-down at boot.
Δ Signal used at boot	n/a	SWCLK. 40K pull-down at boot.

### Module Pin 28 (D2)

	B-SoM	M-SoM
Pin Number	28	28
Pin Name	D2	D2
Pin Alternate Name	RTS	RTS
Δ Description	SPI1 SCK, Serial1 RTS, PWM, GPIO, Wire1 SDA	D2 GPIO, Serial RTS flow control (optional), SPI1 SCK

	Supports digitalRead	Yes	Yes
	Supports digitalWrite	Yes	Yes
	UART serial	RTS. Use Serial1 object.	RTS. Use Serial1 object.
	SPI interface	SCK. Use SPI1 object.	SCK. Use SPI1 object.
	I2C interface	SDA. Use Wire1 object.	SDA. Use Wire1 object.
Δ	Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ	Internal pull resistance	13K	???

### Module Pin 29 (A6)

	B-SoM	M-SoM
	Pin Number	29
	Pin Name	A6
Δ	Pin Alternate Name	D16
Δ	Description	A6 Analog in, GPIO, PWM, M.2 eval PMIC INT
	Supports digitalRead	Yes
	Supports digitalWrite	Yes
	Supports analogRead	Yes
	Supports analogWrite (PWM)	Yes
Δ	Supports tone	A0, A1, A6, and A7 must have the same frequency.
Δ	Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.
Δ	Internal pull resistance	13K
		???

### Module Pin 30 (SOM0 / CELL USBD+)

	B-SoM	M-SoM
	Pin Number	30
Δ	Pin Name	SOM0
	Pin Alternate Name	CELL USBD+
Δ	Description	Cellular Modem USB Data+. Cellular Modem USB Data+
	Input is 5V Tolerant	Yes
		Yes

### Module Pin 31 (A7)

	B-SoM	M-SoM
	Pin Number	31
	Pin Name	A7
Δ	Pin Alternate Name	D17
Δ	Description	A7 Analog In, WKP, GPIO D28
	Supports digitalRead	Yes
	Supports digitalWrite	Yes
	Supports analogRead	Yes
Δ	Supports analogWrite (PWM)	No

Δ Supports tone	A0, A1, A6, and A7 must have the same frequency.	No
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	???

#### Module Pin 32 (SOM1 / CELL USBD-)

	B-SoM	M-SoM
Pin Number	32	32
Δ Pin Name	SOM1	CELL USBD-
Pin Alternate Name	CELL USBD-	CELL USBD-
Δ Description	Cellular Modem USB Data-	Cellular Modem USB Data-
Input is 5V Tolerant	Yes	Yes

#### Module Pin 33 (GND)

Unchanged between B-SoM and M-SoM	
Pin Number	33
Pin Name	GND
Description	Ground.

#### Module Pin 34 (D8)

	B-SoM	M-SoM
Pin Number	34	34
Pin Name	D8	D8
Δ Pin Alternate Name	CS	D8
Δ Description	GPIO, SPI SS	D8 GPIO, SPI SS
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Δ SPI interface	SS. Use SPI object. This is only the default SS/CS pin, you can use any GPIO instead.	Default SS for SPI.
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	2.1K

#### Module Pin 35 (SOM14)

Unchanged between B-SoM and M-SoM	
Pin Number	35
Pin Name	SOM14
Description	M.2 pin 51. Not currently used, leave unconnected.

#### Module Pin 36 (MISO)

	B-SoM	M-SoM
Pin Number	36	36
Pin Name	MISO	MISO
Pin Alternate Name	D11	D11

Δ Description	SPI MISO, GPIO	D11 GPIO, PWM, SPI MISO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Δ Supports analogWrite (PWM)	No	Yes
Δ Supports tone	No	Yes
SPI interface	MISO. Use SPI object.	MISO. Use SPI object.
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	2.1K

### Module Pin 37 (SOM15 / A5)

	B-SoM	M-SoM
Pin Number	37	37
Δ Pin Name	SOM15	A5
Δ Pin Alternate Name	n/a	D14
Δ Description	M.2 pin 53. Not currently used, leave unconnected.	A5 Analog in, PWM, GPIO, SWCLK, shared with pin 43
Δ Supports digitalRead	n/a	Yes
Δ Supports digitalWrite	n/a	Yes
Δ Supports analogRead	n/a	Yes
Δ Supports analogWrite (PWM)	n/a	Yes
Δ Supports tone	n/a	Yes
Δ Supports attachInterrupt	n/a	Yes
Δ Internal pull resistance	n/a	42K
Δ SWD interface	n/a	SWCLK. 40K pull-down at boot.
Δ Signal used at boot	n/a	SWCLK. 40K pull-down at boot.

### Module Pin 38 (MOSI)

	B-SoM	M-SoM
Pin Number	38	38
Pin Name	MOSI	MOSI
Pin Alternate Name	D12	D12
Δ Description	SPI MOSI, GPIO	D12 GPIO, PWM, SPI MOSI
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Δ Supports analogWrite (PWM)	No	Yes
Δ Supports tone	No	Yes
SPI interface	MOSI. Use SPI object.	MOSI. Use SPI object.
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	2.1K

### Module Pin 39 (SOM16 / D27)

	B-SoM	M-SoM
Pin Number	39	39
Δ Pin Name	SOM16	D27

Δ Description	M.2 pin 55. Not currently used, leave unconnected.	D27 GPIO, SWDIO (SWD_DATA), do not pull down at boot
Δ Supports digitalRead	n/a	Yes
Δ Supports digitalWrite	n/a	Yes
Δ Supports attachInterrupt	n/a	Yes
Δ Internal pull resistance	n/a	42K
Δ SWD interface	n/a	SWDIO. 40K pull-up at boot.
Δ Signal used at boot	n/a	SWDIO. 40K pull-up at boot. Low at boot triggers MCU test mode.

### Module Pin 40 (SCK)

	B-SoM	M-SoM
Pin Number	40	40
Pin Name	SCK	SCK
Pin Alternate Name	D13	D13
Δ Description	SPI SCK, GPIO	D13 GPIO, SPI SCK
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
SPI interface	SCK. Use SPI object.	SCK. Use SPI object.
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	2.1K

### Module Pin 41 (SOM17)

Unchanged between B-SoM and M-SoM	
Pin Number	41
Pin Name	SOM17
Description	M.2 pin 57. Not currently used, leave unconnected.

### Module Pin 42 (GND)

Unchanged between B-SoM and M-SoM	
Pin Number	42
Pin Name	GND
Description	Ground.

### Module Pin 43 (SOM18 / D26)

	B-SoM	M-SoM
Pin Number	43	43
Δ Pin Name	SOM18	D26
Δ Description	M.2 pin 59. Not currently used, leave unconnected.	D26 GPIO
Δ Supports digitalRead	n/a	Yes
Δ Supports digitalWrite	n/a	Yes
Δ Supports attachInterrupt	n/a	Yes
Δ Internal pull resistance	n/a	???

Module Pin 44 (SOM12 / D24)

	B-SoM	M-SoM
Pin Number	44	44
Δ Pin Name	SOM12	D24
Δ Description	M.2 pin 58. Not currently used, leave unconnected.	D24 GPIO, Serial2 TX, do not pull down at boot
Δ Supports digitalRead	n/a	Yes
Δ Supports digitalWrite	n/a	Yes
Δ UART serial	n/a	TX. Use Serial2 object.
Δ Supports attachInterrupt	n/a	Yes
Δ Internal pull resistance	n/a	42K
Δ Signal used at boot	n/a	Low at boot triggers ISP flash download

Module Pin 45 (RGBR)

	B-SoM	M-SoM
Pin Number	45	45
Pin Name	RGBR	RGBR
Δ Pin Alternate Name	n/a	RGBR
Description	RGB LED Red	RGB LED Red
Δ Signal used at boot	n/a	Low at boot triggers trap mode

Module Pin 46 (SOM13 / D25)

	B-SoM	M-SoM
Pin Number	46	46
Δ Pin Name	SOM13	D25
Δ Description	M.2 pin 60. Not currently used, leave unconnected.	GPIO25, Serial2 RX
Δ Supports digitalRead	n/a	Yes
Δ Supports digitalWrite	n/a	Yes
Δ UART serial	n/a	RX. Use Serial2 object.
Δ Supports attachInterrupt	n/a	Yes
Δ Internal pull resistance	n/a	42K
Δ Signal used at boot	n/a	Goes high at boot

Module Pin 47 (RGBG)

	B-SoM	M-SoM
Pin Number	47	47
Pin Name	RGBG	RGBG
Δ Pin Alternate Name	n/a	RGBG
Description	RGB LED Green	RGB LED Green

Module Pin 48 (D22)

	B-SoM	M-SoM
Pin Number	48	48
Pin Name	D22	D22

Δ Pin Alternate Name	GPIO0	D22
Δ Description	GPIO D22	D22 GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	???

#### Module Pin 49 (RGBB)

	B-SoM	M-SoM
Pin Number	49	49
Pin Name	RGBB	RGBB
Δ Pin Alternate Name	n/a	RGBB
Description	RGB LED Blue	RGB LED Blue

#### Module Pin 50 (D23)

	B-SoM	M-SoM
Pin Number	50	50
Pin Name	D23	D23
Δ Pin Alternate Name	GPIO1	D23
Δ Description	GPIO D23	D23 GPIO
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	???

#### Module Pin 51 (SOM5)

	B-SoM	M-SoM
Pin Number	51	51
Pin Name	SOM5	SOM5
Pin Alternate Name	SIM_VCC	SIM_VCC
Δ Description	Leave unconnected. External SIM support is not available on B-SoM.	Leave unconnected, 1.8V/3V SIM Supply Output from R410M.

#### Module Pin 52 (D4)

	B-SoM	M-SoM
Pin Number	52	52
Pin Name	D4	D4
Pin Alternate Name	PWM0	PWM0
Δ Description	SPI1 MISO, PWM, GPIO D4	D4 GPIO, PWM
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	Yes	Yes
Δ Supports tone	D4, D5, and D6 must have the same frequency.	Yes
SPI interface	MISO. Use SPI1 object.	MISO. Use SPI1 object.
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes

Δ Internal pull resistance	13K	???
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### Module Pin 53 (SOM6)

	B-SoM	M-SoM
Pin Number	53	53
Pin Name	SOM6	SOM6
Pin Alternate Name	SIM_RST	SIM_RST
Δ Description	Leave unconnected. External SIM support is not available on B-SoM.	Leave unconnected, 1.8V/3V SIM Reset Output from cellular modem.

### Module Pin 54 (D5)

	B-SoM	M-SoM
Pin Number	54	54
Pin Name	D5	D5
Pin Alternate Name	PWM1	PWM1
Δ Description	PWM, GPIO D5	D5 GPIO, PWM
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	Yes	Yes
Δ Supports tone	D4, D5, and D6 must have the same frequency.	Yes
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	???

### Module Pin 55 (SOM7 / SOM8)

	B-SoM	M-SoM
Pin Number	55	55
Δ Pin Name	SOM7	SOM8
Pin Alternate Name	SIM_CLK	SIM_CLK
Δ Description	Leave unconnected, 1.8V/3V SIM Clock Output from R410M.	Leave unconnected, 1.8V/3V SIM Clock Output from cellular modem.

### Module Pin 56 (D6)

	B-SoM	M-SoM
Pin Number	56	56
Pin Name	D6	D6
Pin Alternate Name	PWM2	PWM2
Δ Description	PWM, GPIO D6	D6 GPIO, PWM
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Supports analogWrite (PWM)	Yes	Yes
Δ Supports tone	D4, D5, and D6 must have the same frequency.	Yes
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	???

### Module Pin 57 (SOM8 / SIM\_DATA)



	B-SoM	M-SoM
Pin Number	57	57
Δ Pin Name	SOM8	SIM_DATA
Pin Alternate Name	SIM_DATA	SIM_DATA
Δ Description	Leave unconnected. External SIM support is not available on B-SoM.	Leave unconnected, 1.8V/3V SIM Data I/O of cellular modem with internal 4.7 k pull-up.

### Module Pin 58 (D7)

	B-SoM	M-SoM
Pin Number	58	58
Pin Name	D7	D7
Pin Alternate Name	PWM3	PWM3
Δ Description	PWM, GPIO D7, Blue LED	D7 GPIO, PWM
Supports digitalRead	Yes	Yes
Supports digitalWrite	Yes	Yes
Δ Supports analogWrite (PWM)	PWM is shared with the RGB LED, you can specify a different duty cycle but should not change the frequency.	Yes
Δ Supports tone	No	Yes
Δ Supports attachInterrupt	Yes. You can only have 8 active interrupt pins.	Yes
Δ Internal pull resistance	13K	???

### Module Pin 59 (GND)

#### Unchanged between B-SoM and M-SoM

Pin Number 59

Pin Name GND

Description Ground.

### Module Pin 60 (SOM9 / SOM8)

	B-SoM	M-SoM
Pin Number	60	60
Δ Pin Name	SOM9	SOM8
Δ Pin Alternate Name	n/a	CELL_RI
Δ Description	M.2 pin 75. Not currently used, leave unconnected.	CELL_RI, ring indicator output, leave unconnected.

# Schematics

To be provided at a later date.

# Mechanical specifications

## DIMENSIONS AND WEIGHT

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To be provided at a later date.

# Revision history

Revision	Date	Author	Comments
pre	2024-03-18	RK	Initial Release (based on board v0.2 20240315)