# AMA Advanced Flight System Committee Remote ID Module Status Report Summer 2023



# 2023 SUMMER STATUS OF FAA COMPLIANT REMOTE-ID MODULES

**AMA Advanced Flight System Committee** 

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AMA's Advanced Flight Systems Committee members Tyler Dobbs, Tony Stillman, and I have been participating in meetings since 2020 with developers of Remote-ID (RID) modules to evaluate their systems, specifications, and test results. This past year AMA and members flew model airplanes with modules affixed to them from several of the manufacturers. The modules tested proved to be easy to set up, configure and use the recommended cell/iPad display apps. The position data of longitude, latitude, and altitude including the serial number, velocity, and the flight tracking broadcasted and displayed on cell phones/iPads were accurate at ranges over a kilometer. There wasn't any noted RF interference with the onboard R/C systems.

On September 16, 2023, recreational RC flyers will have to affix an FAA-approved RID module on/in their model aircraft to fly at other than their club FRIA sites. To aid flyers who may want to purchase a module the online PDF version of this AMA RID Module Status Report is updated when a module is listed on the FAA Declaration of Compliance webpage. This report allows pilots to view a chart on page 2 that lists each of the RID modules with their prices and specifications for easy comparisons with active links to seller's websites and datasheets on the GPS receiver and Bluetooth (BT) broadcast module's chips for those who want to explore more technical data.

All of the modules listed have met or exceeded the FAA's § 89.320 minimum performance requirements including ASTM F3411-22a standards. Today's GNSS/GPS receiver module chips can achieve horizontal position accuracies of between 5ft. to 10 ft. and vertical accuracy of 16 ft. or less 95% of the time. This exceeds FAA's horizontal accuracy requirements of 100 ft., and vertical accuracy of 150 ft. 95% of the time.

This report was submitted in June when 14 modules were on the chart with 10 being standalone plug & play RID broadcast modules and 4 being for drones already equipped with GPS. Only two RID modules from uAvionix and Pierce Aerospace may be available for preorder in the USA however Horizon Hobby, Futaba, and others will be introducing modules later in the summer. Popular listed FAA Modules from Dronetag in the Czech Republic and Blue Mark in the Netherlands, Eur. have been selling in the USA since October of 2022.

Prices vary because the RID module may be with or without battery and case, or have different versions of GNSS/GPS satellite receiver and Bluetooth (BT) broadcast module chips. The ultra-micro size and lightweight module chips and those with better position accuracy, and range cost more. The BT 5.0/5.1 version chips cost more because they draw much less current providing more hours of runtime, and at 2Mb/sec doubling the data transmit rate and providing better error correction than the older BT 4.0+ versions. When and where manufacturing is done and shipped from can add to selling prices. FAA's \$50 estimate cost of modules in 2020 was based on module chips that are now obsolete.

We recommend that members who want to fly at non-FRIA sites be patient while we work towards getting better RID module prices and possible discounts for AMA members as we head toward the September deadline. Keep checking the RID status reports and other documents at <a href="https://www.amadistict-i.org/rids">www.amadistict-i.org/rids</a>

Check the following chart to determine RID-module selling prices, availability, and specifications including the Bluetooth module and GPS Receiver module chip's datasheets and their estimated cost to the manufacturers when the info was available. Chip data/cost shown may vary from the original data resources.

NOTE – The blue text content will link to websites with updated data on most of the modules and chips used.

#	1 RID-Module & Web	2 Availability	3 Price	4 Weight	5 Size inch	6 Battery	7 Bluetooth IC Chip	8 GPS IC Chip	9 Misc.
1.	uAvionix - pingRID	Backordered	\$299	21 gr.	1.0 x 0.7 x	2 hours	ESP32-C3-MINI-1	SAM-M8Q	CASE
	Montana, USA				1.7		Mfg. Cost \$2.15	Mfg. \$17.04	BT 5.0
3.	Blue Mark – Db121	In stock	\$118	11 gr.	1.4 x 1.5 x	Requires	ESP32-C3-WROOM-02	ATGM336H	CASE
	Netherlands, Eur.				1.0	5-14 v	Mfg. Cost \$2.10	<u>5N31</u> \$2.57	BT 5.0
4.	Blue Mark – Db120	In stock	\$139	25 gr.	1.9 x 1.5 x	3 hours	ESP32-C3-WROOM-02	ATGM336H	CASE
	Netherlands, Eur.				1.0		Mfg. Cost \$2.10	<u>5N31</u> \$2.57	BT 5.0
5.	Blue Mark-Db122fpv	In stock	\$76	4.5 gr.	1.0 x 1.0 x	Requires	ESP32-C3-WROOM-02	For Drones	For FPV
	Netherlands, Eur.				0.16	4.5-15 v	Mfg. Cost \$2.10	with GPS	BT 5.0
6.	Drone D. AeroPing	Inquire on	\$160	Inquire	Inquire	Battery	ESP32-C3-MINI-1U	No details yet	CASE
	United Kingdom	website				Inquire	Mfg. Cost \$2.15	on GPS used	BT 5.0
7.	Dronetag - Beacon	In stock	\$215	16 gr.	1.5 x 1.0 x	8-16	LAIRD BL653	MIA-M10Q	CASE
	Czech Republic				0.6	hours	Mfg. Cost \$8.59	Mfg. Cost \$14.70	BT 5.1
8.	<u>Dronetag - Mini</u>	In stock	\$299	32 gr.	2.1 x 1.3 x	8 - 16	LAIRD BL653	MIA-M10Q	CASE
	Czech Republic				0.6	hours	Mfg. Cost \$8.59	Mfg. Cost \$14.70	BT 5.1
9.	Zephyr Systems Db120	Reseller of	\$305	25 gr.	1.9 x 1.5 x	3 hours	ESP32-C3-WROOM-02	ATGM336H	Not
	USA (Not counted)	Blue Mark			1.0		Mfg. Cost \$2.10	<u>5N31</u> \$2.57	OEM
10.	Dronetag-Basic Solution	Stock Jul/Aug	\$89.00	3 gr. with	0.66 x 0.55	Requires	ANNA-B412	MIA-M10Q	PCB
	Czech Republic			antennas	x 0.19	3.3-17 v	Mfg. Cost \$8.80	Mfg. Cost \$14.70	BT 5.1
11.	<u>Dronetag-DRI</u> For Mfg.	End of June	\$49.00	1.5 gr.	0.89 x 0.62	Requires	ANNA-B412	For Drones	PCB
	Czech Republic	availability		No case	x 0.19	3.3-17v	Mfg. Cost \$8.80	with GPS	BT 5.1
12.	Aerobits idME	Not Yet FAA	\$106.00	4 gr.	1.24 x 0.61	Requires	ESP32 SERIES	ZOE-M8B	CASE
	Poland	Compliant			x 0.29	5.0v	Mfg. Cost \$2.10	Mfg. Cost \$14.70	BT 5.0
13.	Futaba FRID-1	FAA COMPLIANT	\$125	9 gr.	0.79 x 1.0 x	Require3	Not available yet	Not available	SHRINK
	Japan NOT YET in USA	Waiting for Publication			0.31	.5-8.4v	Japanese manual page	yet	WRAP
14.	B1 Remote ID Beacon	Available	\$264.95	30 gr.	2.87 x 0.94	6 hours	LAIRD BL654	Not available	CASE
	Indiana, USA	July/August			x 0.75		Mfg. Cost \$11.73	yet	BT 5.0
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CHART IS UPDATED AS NEW RID MODULES BECOME AVAILABLE
BLUETOOTH AND GPS CHIP DATA & COSTS CAME FROM <u>DIGIKEY.COM</u> AND OTHER ELECTRONIC SUPPLIERS
CHIPS USED IN MODULES AND PRICES SHOWN MAY CHANGE
Bluetooth (BT versions 5.0, or 5.1)

NOTE: The RID module components available now far exceed FAA's performance compliance requirements and so they cost more. Add that to inflation, mfg. labor and shipping costs so we may expect basic modules without additional features and functionalities to range in price from \$80 to \$149 as more manufacturers enter the market. Those modules in hard/waterproof cases, with internal antennas, logging and exporting of flight data, GPS data sharing utilizing the R/C receivers telemetry to the pilot's transmitters, more costly module chip versions allowing for BT broadcast ranges to exceed 2km, and GPS position accuracies of less than a few meters may have a price range from \$150 - \$299.

In general, as the demand for RID modules increases manufacturers larger purchase volume discounts for components will allow manufacturers to produce modules for less and lower the selling prices to RC modelers.

(1)



FAA Compliance Report

Remote-ID User & Install Guide

Bluetooth Manual ESP32-C3-MINI-1

Digi-Key Bluetooth
Chip Datasheet



\$299.00

uAvionix Corporation 300 Pine Needle Lane Bigfork, MT 59911 (844) 827-2372

Meeting the FAA's Remote ID mandate has never been easier.

The pingRID module is small, lightweight, and easy to attach to any drone, pingRID will keep you flying with trusted aviation-grade avionics from uAvionix. Whether you're flying for recreation or commercial part 107, pingRID has you covered.



# uAvionix announces pingRID for FAA Mandated Remote ID Broadcast for Drones

### 02/28/23 | Press Release

Remote ID Broadcast module for drones, pingRID. The aviation-grade, small, lightweight, and easily attached transmitter is the fastest and simplest way for drone operators to be compliant with the FAA Remote ID rule. uAvionix is pleased to apply its avionics experience by delivering a product that meets the FAA's requirements without sacrificing the drone operators' time or aircraft performance," notes Paul Beard, uAvionix CEO and Academy of Model Aeronautics Hall of Famer. "A license plate for your drone needn't be complex or require an application to run and with pingRID, you simply charge, attach and fly – it's that easy."

The uAvionix pingRID comes pre-configured and ready for use out of the box. After assigning the pingRID unique identification number to the aircraft's registration with the FAA, operators are free to attach the battery-powered device to their drone and prepare for flight. A simple set of LED indicators provides status on the battery charge, device readiness for flight, and inflight operations. The ultra-compact, lightweight design fits most aircraft without impacting performance, and is quickly rechargeable via USB-C.

### **Tech Specs**

Specification	Value					
Compliance	FAA 14 CFR Part 89, DoC RID000000132, ASTM F3411-22					
Protocols	Bluetooth 4 Legacy, Bluetooth 5 Long Range					
Frequency	2402 MHz to 2480 MHz					
Size	25.40 x 16.63 x 43.42 mm					
Weight	21 grams					
Charging Connector	USB-C					
Battery	Internal Li-ion (740 mWh)					
Indicators	Charge LED, Status LED 2 hours on a single charge					



# Blue Mark Drone Website

# Bluetooth Manual ESP32 C3 WROOM

Bruggenmorsweg 10, 7521ZV Enschede, The Netherlands

+31 53 711 2104 info@bluemark.io

**Drone Beacon Transponder** 

FAA Compliance Report Digi-Key Bluetooth
Chip Datasheet





DroneBeacon Db121pcb RemoteID

Broadcast Module

€ 99,00 ex. \$106.84



DroneBeacon Db121 RemoteID

Broadcast Module

€ 109,00 ex. \$117.66



DroneBeacon Db120 RemoteID

Broadcast Module

€ 129,00 ex \$139.26

### FAA approval PRODUCT PAGE

RID000000089

**Short-range radio** 

**MANUAL** 

Bluetooth and WiFi 2.4GHz, output power (ERP): + 20 dBm (100 mW)

**Positioning** 

GPS, GLONASS, 2.5m positioning precision < 35 seconds for first fix

**Antennas** 

3 dBi WLAN/BLE antenna (IPEX connector)

0 dBi GPS antenna (IPEX connector)

Power

2-pin JST-GH 1.25mm connector 5 – 14 V

auxiliary unpopulated 2.54mm 2-pin header 5 – 14 V

**LED lights** 

status, configuration mode

Fastening mechanism

4x M2 screws

Operating temperature -5°C to +40°C

Dimensions - 33 x 35 x 5 mm

Weight - 5 grams (including antennas)

FAA approval PRODUCT PAGE

RID000000088

Short-range radio MANUAL

Bluetooth and WiFi 2.4GHz, output power (ERP): + 20 dBm (100 mW)

**Positioning** 

GPS, GLONASS, 2.5m positioning precision < 35 seconds for first fix

**Antennas** 

O dBi WLAN/BLE antenna (internal omni-directional high-performance PCB antenna)

0 dBi GLS antenna

**Power** 

2-pin JST-GH 1.25mm connector 5

– 14 V

**LED lights** 

status, configuration mode

**Enclosure** 

plastic (nylon)

Fastening mechanism

3M dual-lock or M5 screws using the screw noses

**IP** rating

IP43

**Operating temperature** 

-5°C to +40°C

**Dimensions** 

36 x 38 x 28 mm.

Weight - 11 grams

FAA approval PRODUCT PAGE
RID000000058

**Short-range radio** 

**MANUAL** 

Bluetooth and WiFi 2.4GHz, output power (ERP): + 20 dBm (100 mW)

**Positioning** 

GPS, GLONASS, 2.5m positioning precision < 35 seconds for first fix

**Antennas** 

O dBi antenna (internal omnidirectional high-performance PCB antenna)

**Battery** 

LiPo 3.7V 600 mAh, battery life > 3

hours charging, 5V USB-C, 1 hour

from a discharged state

**LED lights** 

charging, battery level (4x), configuration mode

**Enclosure** 

plastic (nylon)

Fastening mechanism

3M dual-lock or M5 screws using the screw noses

**IP** rating IP43

**Operating temperature** 

-5°C to +40°C

**Dimensions** 

48 x 38 x 28 mm.

Weight - 25 grams

(5) Db122fpv FOR FPV OPERATIONS

Bluetooth broadcast module only and will require a GPS receiver. \$76.00

**Size** - 01x01x0.16 **Weight** - 4.5 grams

# (6) Drone Defence AeroPing

FAA Compliance Report

Bluetooth Manual ESP32-C3-MINI-1U

Digi-Key Bluetooth
Chip

**AeroPing Website** 

ESP32-C3-MINI-1U DATASHEET



Drone Innovation Centre, Retford, UK +44 (0) 843 289 2805 info@dronedefence.co.uk



AeroPing operates in a highly independent fashion. It has its own power source and sensors for position, altitude, temperature, pressure, speed and direction.

Simply attach it easily to a drone, and it is ready to be used.

Data can then be accessed in real-time by drone fliers and any relevant authorities with the necessary permissions through our AeroTracker platform. (NOTE MAY NEED RECONFIGUATION TO WORK IN USA)

AeroPing RRP is £150 or \$ 161.65 per module, to get additional info go to the AeroPing website and complete a form.

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# **Dronetag Beacon**

Dronetag Beacon Website

FAA Compliance Report

Bluetooth Manual Laird BL653





Dronetag s.r.o. Veltruská 602/16 190 00 Praha 9, Czech Republic +420 602 870 462 info@dronetag.cz

**Digi-Key Bluetooth Chip** 

**BL653 Chip Datasheet** 



**BUY INFO CLICK \$ 214.89** 

Short-range radio - Bluetooth 2.4GHz

**Sensors -** GNSS, barometer, accelerometer

Positioning - GPS L1, GLONASS L1, Galileo E1, SBAS

**Built-in Antennas** Bluetooth and GNSS **Optional Antennas** Bluetooth via MMCX plugs

**External ports** 3.3V extension connector and 5V Micro USB

Battery LiPo 3.7V 200 mAh

**Battery life** 8-16 hours (depending on the configuration)

Charging 5V Micro USB

Charging time - 2 hours from a discharged state

Average current consumption - 15mA Maximum current consumption - 100mA

Enclosure - plastic

Fastening mechanism - 3M Dual-lock SJ4570

IP rating - IP43

Operating temp. -20 °C to +60 °C (-4 °F to 140 °F) Dimensions - 37  $\times$  26  $\times$  16 mm (1.5  $\times$  1.0  $\times$  0.6 in)

Weight - 16 grams (0.56 oz.)

**Slap-on device so your drone can legally fly.** Effortless way to let your drone fly safe & compliant in EU and US regions. Direct/Broadcast Remote Identification device compatible with any drone.

What is the difference between this product and ESP32-based ones?

Some Remote ID manufacturers tend to select ESP32 microcontrollers as the base of their OEM solutions without further research. However, ESP32 systems are well known for questionable production quality, common overheating, electromagnetic noise, and interference issues. Since Remote ID is a crucial aircraft component, its malfunction can easily force the drone to land in a dangerous situation. Even though ESP32 MCUs can be more price-competitive, we will never allow our customers to take such unnecessary risks. Therefore, Dronetag DRI is built on industrial components of non-Chinese origin, and each unit goes through production testing.

#### Why is it not a good idea to use Bluetooth and Wi-Fi RID simultaneously?

Most Remote ID implementations transmitting Bluetooth and Wi-Fi simultaneously don't implement radio coexistence protocols. This means the radio chip is overwhelmed with transmitting requests despite insufficient radio capacity to send out those data. The result is that the device sends out corrupted data at unreliable frequencies (not fulfilling the requirements in standards) while **creating unnecessary electromagnetic noise and interference.** 

#### Where is the device manufactured?

All of the devices are manufactured in Prague, Czech Republic, Europe. But the manufacturing site can be changed depending on the customer's needs.

Dronetag Beacon is the bare minimum solution for Direct / Broadcast Remote via Bluetooth 4 and 5. It ensures that your drone is detectable to all air traffic participants and allows you to track the drone in real-time. It may be attached to any drone regardless of its manufacturer and makes you compliant with new EU and US regulations.







**BUY INFO CLICK \$299** 

Bluetooth Manual Laird BL653

**Digi-Key Bluetooth Chip** 

BL653 Chip Datasheet

**Professional Remote ID** Designed for professional pilots. Combination of both Network & Direct / Broadcast Remote ID to make your drone flight safe & compliant.

#### **Network Remote Identification**

Dronetag Mini transfers your drone's position and identification to our cloud. By displaying the real-time data in our app Dronetag enables advanced drone operations and coordination of manned and unmanned traffic in the same airspace.

### **Direct (Broadcast) Remote Identification**

Your drone's info is transmitted via Bluetooth to up to 1.5 km (0.9 miles). With our Direct Remote ID, you fulfil all the new regulation necessities, and you are free to fly & touch the sky!

Cellular - LTE-M and Narrowband IoT (NB-IoT)
Cellular bands: 3, 8, 20 for the EU and 2, 4, 12 for the US
Bluetooth 2.4GHz

Sensors - GNSS, barometer, accelerometer
Positioning - GPS L1, GLONASS L1, Galileo E1, SBAS
SIM card - Chip SIM soldered on the mainboard
Built-in Antennas Internal LTE, Bluetooth and GNSS
Optional Ant. External LTE and Bluetooth via plugs
External ports 3.3V extension connector and 5V

Micro USB Battery LiPo 3.7V 500 mAh
Battery life 8-14 hours (depending on the configuration)

Charging 5V Micro USB

Charging time 2 hours from a discharged state

Average current consumption 50mA

Maximum current consumption 1A

Enclosure plastic

Fastening mechanism 3M Dual-lock SJ4570

IP rating IP43

Operating temperature -20 °C to +60 °C

-5°C to +40°C

Size 54x35x15 mm (2.1x1.3x0.6 in)

Weight 32 grams (1.1 oz)

# (9) Zephyr Systems

A US reseller of the OEM's Blue Mark Db120 Remote-ID module. All specifications are the same as module (2).



Zephyr Systems Website





**FAA Compliance Report** 

**Bluetooth Manual Anna-B412** 

**DigiKey Anna-B412** 

**DigiKey MIA-M10Q** 

DRONETAG BASIC SOLUTION (BS) - THE RETAIL PRICE IS \$89.00

Dronetag BS is the best Remote ID solution for FPV pilots, aeromodelers, and recreational pilots. BS offers affordable Broadcast / Direct Remote capability as defined by FAA and EASA. It is the smallest and lightest Remote ID solution making it easier than ever for aeromodelers and FPV pilots to comply with regulations while enjoying their favorite hobby.

External Bluetooth and **Positioning antennas** are not included, you may use your own antennas, or **you can buy one of these**:

- Combined Bluetooth + GNSS Positioning Antenna (U.FL) \$9.90
- GNSS Positioning Antenna Compact Size (U.FL) \$4.90
- Bluetooth Antenna Ultra Small (U.FL) \$4.90
- o Bluetooth Antenna High Performance (U.FL) \$4.90

Dronetag s.r.o. Veltruská 602/16 190 00 Praha 9, Czech Republic +420 602 870 462

The BS can be powered from up to 17V power input, or you can consider optionally using the small 3.7V Li-Po batteries (e.g., 50 mAh can run up to two hours). Batteries must have a JST SH 3-pin connector.

#### **Data sheet**

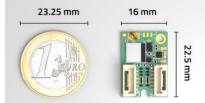
Remote ID types Broadcast (US) Short-range radio Bluetooth 2.4GHz Average current consumption 15 mA Maximum current consumption 50 mA Mounting - Adhesive or Velcro Operating temperature -40°C to +85°C Dimensions- 0.66 x 0.55 x 0.19 in

Weight – 3 grams, No Case or Battery
Standard ones - configurable in Dronetag app
Input voltage 3.3 – 17V
Input voltage regulator
Low-noise buck converter
Remote ID Standards
ASD-STAN EN 4709-002 & ASTM F3411-22
Certifications Uses FCC/CE approved module
Remote ID technology
Bluetooth 5.1 Long Range 1.86 miles/3 km

### **Product Details** (new adding 2 wire antennas)

- Easy installation and compatibility with various aircraft hardware setups
- Real-time tracking and Remote ID compliant with the FAA rule.
- Powered from the existing aircraft or a small LiPo battery (up to 17V input) No LED Status Notification Yet
- Configuration and firmware updates via Dronetag App
- Can be used as GNSS input to Betaflight controller\*
- Can be used as a telemetry module for popular RC radios\* Spektrum & Futaba
- Flight information logging to flash memory for easy visualization in Dronetag App, Google Earth, or similar\*

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**Dronetag DRI Website** 

**FAA Compliance Report** 

**Bluetooth Manual Anna-B4** 

\$49.00

**For manufacturers to equip their new drone models** with technology for Direct / Broadcast remote identification (RID). Connect our factory-ready modules to your drone's flight controller. Dronetag DRI is compatible with all standard Pixhawk controllers running PX4 or Ardupilot. Plug it into your TELEM port, configure the appropriate baud rate, and you are ready to fly. DRI may come with a U.FL connector for an external antenna (for carbon fuselage) or with an internal antenna already on board.

<sup>\*</sup> Functions that will be introduced later via firmware update



ul. Przestrzenna 11 70-800 Szczecin, Poland Aerobits is a Polish technology company that has been operating on a global market since 2017. We deal with miniaturization of avionic systems, such as aviation transponders. All solutions are based on a patented technology that allows to process radio signals on very small surfaces.

NOTE: These modules from Aerobits iDME are not FAA compliant YET, but the specs are provided since they have intentions of seeking FAA compliance as other European mfg. have recently done.



### **PRODUCT INFO**

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## **idME**

Designed to meet requirements of remote drone identification and localization inASTM/ASD-STAN standard. Using the BLE broadcast technology the deviceprovides surveillance and drone operator identification capability based on anymodern mobile devices such as smartphone or tablet.

# idME+

idME+ is designed to meet requirements of remote drone identification and localization in ASTM/ASD-STAN standard. Using the BLE broadcast technology, the device provides surveillance and drone operator identification capability based on any modern mobile devices such as smartphone or tablet.

## **idME PRO**

idME PRO is the most advanced Remote ID with WI-FI and BLE technology. It can broadcast in dual technologies: Wi-Fi (NAN and Beacon frames) BT(BLE, and legacy frames). Using the BLE and WI-FI broadcast technology, the device provides surveillance and drone operator identification capability based on any modern mobile device such as a smartphone or tablet.

# CLICK FOR USER MANUAL AND IDME DATA SHEETS

**CLICK FOR USER MANUAL AND IDME+ DATA SHEETS** 

CLICK FOR USER MANUAL
AND IDME PRO DATA SHEETS

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FAA Accepted but Exhibits not posted yet!
Check at: https://fcc.report/FCC-ID/D063550

Their unit is small in size, 20x30x8 mm very thin. It won't have the extra weight and cost of a battery and case... and may use a Y extension to the receiver's battery for power. It operates on 3.5 - 8.4 v. and draws only 18 ma. It appears to use internal antennas and a simple shrink-wrap casing like an ESC or some satellite receivers. We are waiting for Futaba & FAA to post additional information.

# PIERCE A EROSPACE





# **B1 Remote ID Beacon**

#### \$264.95

The B1 Remote ID beacon offers superior local broadcast performance to meet the FAA's Remote Identification requirements. The B1 comes from a military heritage and has been proven in national security operations with commercial and public safety operators. It is now available to all.

Made in the USA (With Import and US Components). Customer support in the USA.

Exceeds the ASTM F3411-22 Remote ID Standard.

# **WEBSITE**

#### Features:

#### PIERCE AEROSPACE INC

- Built from Military Heritage info@pierceaerospace.net

- High Performance Local Broadcast Fishers, IN 46038

- Meets and Exceeds ASTM Standards
- 2+ km Range
- 6+ hr Runtime per Charge
- Designed and Made in the USA

#### Radio Specifications:

Antenna Type PCB Antenna
Frequency 2400-2480MHz
Radiation Pattern Omnidirectional
Max Output Power +18dBm conducted
Operational output power within FCC/ISED limits

#### **Electrical Specifications:**

Input Voltage Rating 3.75V - 6.00V
Input Amperage Rating 225 mA max
Input Wattage Rating 843 mW max
Battery Type Lithium Polymer
Battery Capacity 400mAh

Battery Endurance 6hr
Charge Time 4hr

#### **Mechanical Specifications:**

Dimensions (LWD) 73mm x 24mm x 19mm

Weight 30g

Mounting Two Cable Tie Slots

Connector USB-C

Operating Temperature -20 °C to +76°C Storage Temperature 10°C to +70°C

Operating Humidity 0% – 95% non-condensing Storage Humidity 0% – 70% non-condensing

**FAA Compliance Report** 

Bluetooth Manual Laird BL654

BL654 Chip Datasheet