



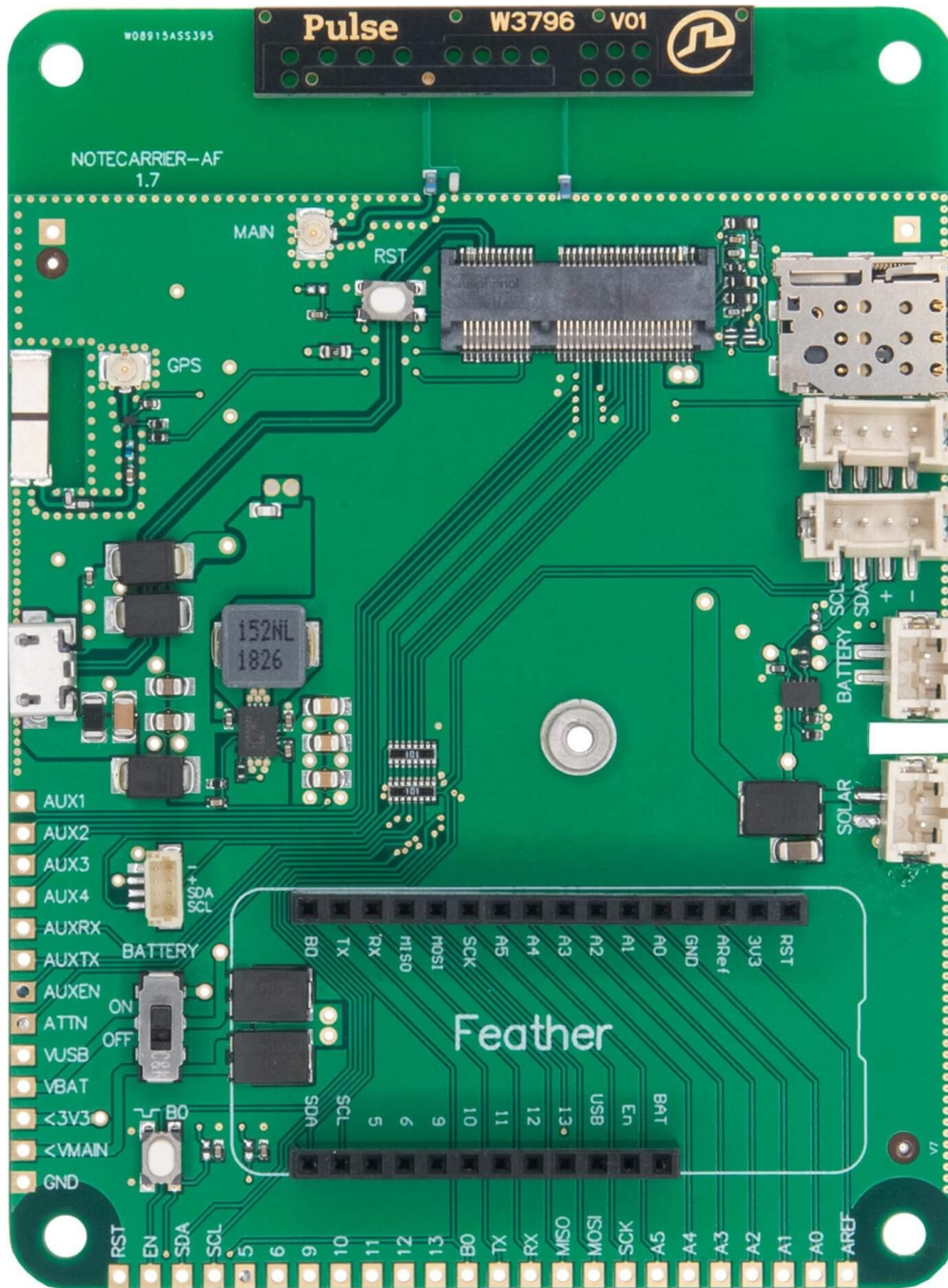
PRODUCT DATASHEET

Notecarrier Datasheet

Notecarrier AF

Notecarrier AF is designed for drop-in development with any Adafruit Feather or compatible microcontroller. It includes a Feather-compatible header socket, onboard cellular/WiFi and active GPS antennas, Grove and Qwiic/STEMMA QT ports for I2C peripherals, and JST connectors for a LiPo battery and solar panel with onboard charging.

Blues Notecarrier® Datasheet: Notecarrier AF



Warning

While this product is still supported, it is no longer available for purchase from the Blues store. We recommend the [Notecarrier F v1.3](#) as an updated, equivalent alternative.

Functional Description

Notecarriers are available in multiple form factors to support rapid development across a range of use cases. Depending on the variant, a Notecarrier may prioritize direct host integration, compact size, integrated cellular/WiFi and GNSS antennas, or the ability to be soldered directly into a low-volume production design.

Notecarriers are explicitly designed to bridge the gap between early prototyping and a production-ready Notecard-based solution. In a final product, the Notecard is typically socketed directly onto a custom PCB via an edge connector, alongside the customer's MCU, sensors, and supporting circuitry. While this approach provides maximum flexibility and modularity, it can significantly increase the effort required during initial development and validation.

To simplify this process, Notecarriers expose the Notecard's interfaces through convenient breakout connections and integrate essential supporting circuitry, including power regulation, protection, and signal conditioning. This allows developers to focus on firmware, connectivity, and system behavior without first designing a complete custom carrier board.

Features

- **Simple.** Provides breadboard compatible pins or solderable mask for direct connections.
- **Compatible.** Level shifters ensure compatibility with 3.3V or 5V equipment.
- **Convenient.** Powered by a USB connector (requires 2A supply).
- **GPS Ready.** Models are either active GPS compatible, or feature a built-in antenna to enable GNSS connectivity.

Compatible Notecards

Due to differences in the physical size of Notecards, certain Notecarriers are only compatible with certain Notecards. The **Notecarrier AF** is compatible with:

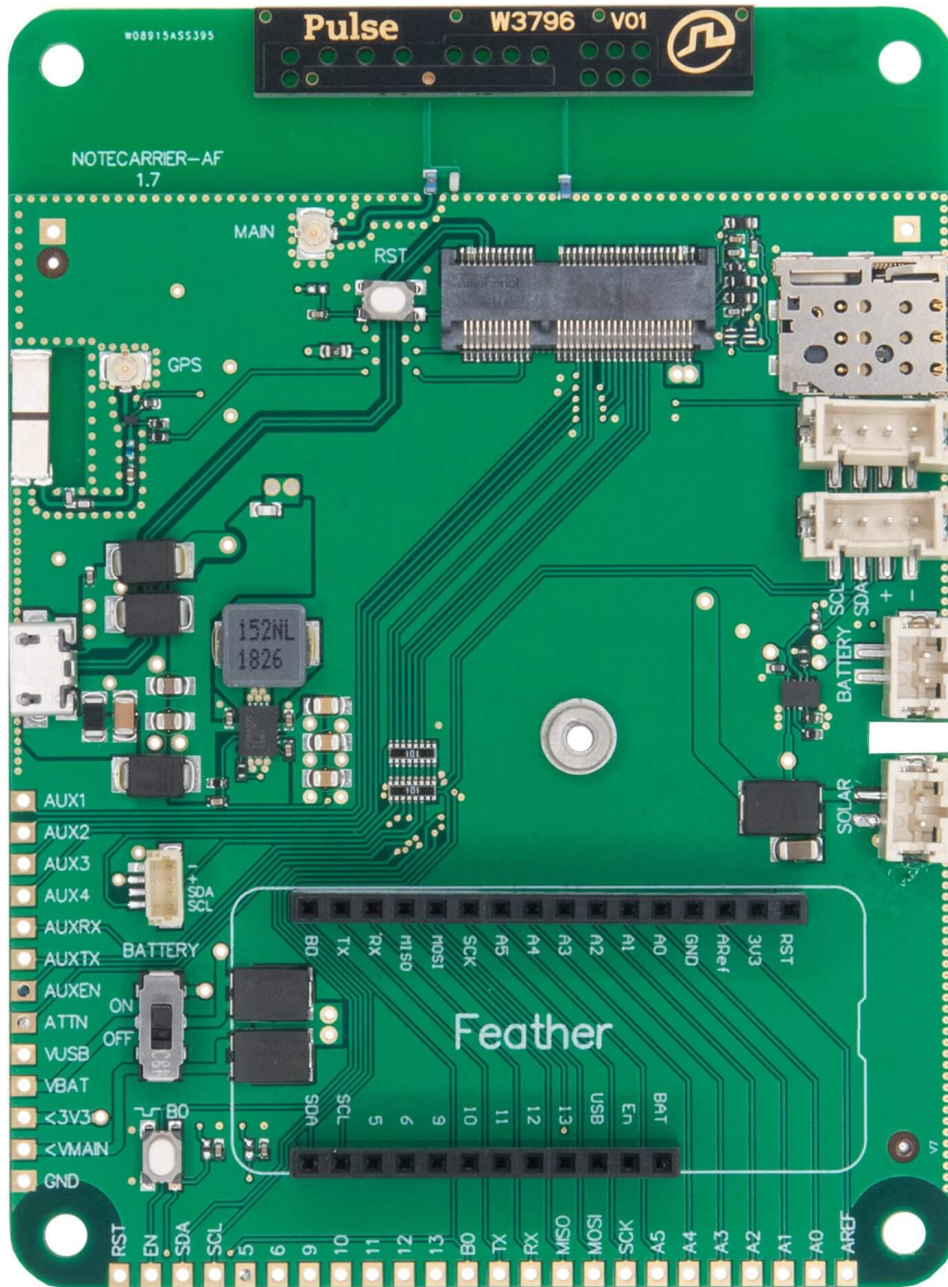
- [Notecard Cellular](#) 
- [Notecard Cellular \(Legacy\)](#) 
- [Notecard WiFi](#) 
- [Notecard LoRa](#) 

Package Configuration

Notecarrier AF (Antenna + Adafruit Feather Socket)

Notecarrier AF (CARR-AF) is designed for drop-in development with any Adafruit Feather or compatible microcontroller. It includes two female pin headers (12-pin and 16-pin) for directly plugging in a Feather compatible board. It also includes Grove and Qwiic/Stemma QT I2C ports for attaching external peripherals to your project.

Front



- Adafruit Feather compatible header socket.
- Breadboard compatible [Notecarrier AF 13-pin header](#).
- Breadboard compatible 24-pin Adafruit Feather breakout header.
- [Notecard edge connector socket](#) and mounting screw receptacle.
- Micro-USB port to power Notecarrier and provide a USB Serial command interface to Notecard.
- Onboard cellular/WiFi and active GPS antennas.

- External [Nano-SIM](#) slot for additional carrier connectivity.
- 2 Seeed Studio Grove I2C ports for attaching external peripherals to your project.
- JST PH connector for a LiPo battery.
- JST PH connector for a solar panel.
- JST SH 3.3V I2C port (Adafruit STEMMA QT and Sparkfun QWiic compatible).
- Battery slide switch to disconnect battery when not in use.
- Momentary button connected to Feather `B0` pin.
- LiPo charging circuit.
- PCB Dimensions: 102mm x 76mm
- Center of Mounting Holes: 94mm x 67mm (measured from the edge of the PCB to the center of the furthest mounting hole)

Pins Shared Between Feather and Notecarrier

Feather	Notecarrier	Dedicated	Reason
<code>RST</code>	<code>RST</code> button	N	Reset
<code>BAT</code>	<code>3V3</code>	Y	Feather power
<code>EN</code>	Notecard <code>EN</code>	Y	Module enable
<code>SDA</code>	Notecard <code>SDA</code>	N	Notecard communication
<code>SCL</code>	Notecard <code>SCL</code>	N	Notecard communication
<code>B0</code>	<code>B0</code> button	N	Momentary button

Note

`BAT` pin is not connected directly to `VBAT` pin on the Notecarrier AF pin out. It is supplied by the onboard 3v3 voltage regulator. See [schematics](#) for more detailed information.

Power Information

All Notecarriers can be powered by connecting directly to the USB port. However, most installations will not have USB power available, so several alternate power options are provided by the various Notecarrier models:

- attaching a LiPo battery.

The LiPo battery must be a single-cell 3.7V battery with a 2-pin JST PH connector.

- attaching a solar cell (must be accompanied by LiPo).

The solar charging circuit is designed for use with a 4.5-7V solar panel.

- applying 2.5-5.5VDC to the **V+** pin.

Commonly provided via DC power supply or non-rechargeable battery.

Warning

It is NOT recommended to use the JST connector on your Feather compatible device to supply power to the Notecarrier AF. Instead it is recommended to utilize the JST connector, labeled **BATTERY**, on the Notecarrier AF.

Doing so will provide the following advantages:

1. Reverse voltage protection.
2. Defer to **V+** and **USB** power sources.

Warning

Typical USB ports may only be capable of supplying 500 mA of current, which might not be enough to power Notecard during a cellular connection to a GSM network (which can spike to 2A). In this situation, you're advised to supplement power to your Notecarrier with an external source (e.g. a LiPo battery).

GPS (GNSS) Antenna Requirements

All Notecarrier models are designed to support active GPS, and several Notecarrier models provide built-in antennas ready to be connected to a Cellular Notecard using the included u.FL cables.

Active GPS Onboard Antenna

The Notecarrier A models feature built-in, active GPS antennas and are designed with a sufficient buffer to isolate the antenna and minimize interference with the other electronics. Notecarrier A models do not support external active (powered) GPS antennas.

Header Descriptions

Notecarrier AF 13-Pin Header

Pin Name	Direction	Usage
AUX1	IN/OUT	API-selectable modes of operation
AUX2	IN/OUT	API-selectable modes of operation
AUX3	IN/OUT	API-selectable modes of operation
AUX4	IN/OUT	API-selectable modes of operation
AUXRX	IN	Diagnostic Interface
AUXTX	OUT	Diagnostic Interface
AUXEN	IN	Enable diagnostics
ATTN	OUT	Configurable interrupt signal
VUSB	IN/OUT	Access to VUSB pin of the USB jack
VBAT	IN/OUT	Access to battery voltage
<3V3	OUT	Access to 3.3V supply voltage
<VMAIN	OUT	Access to either VUSB or VBAT , whichever is available
GND	IN	Ground

Adafruit Feather 24-Pin Breakout Header

Pin Name	Direction	Usage
RST	IN	Active-high reset
EN	IN	Module enable
SDA	IN/OUT	I2C bus data
SCL	IN/OUT	I2C bus clock
5	IN/OUT	Digital I/O pin 5
6	IN/OUT	Digital I/O pin 6
9	IN/OUT	Digital I/O pin 9
10	IN/OUT	Digital I/O pin 10
11	IN/OUT	Digital I/O pin 11
12	IN/OUT	Digital I/O pin 12
13	IN/OUT	Digital I/O pin 13
B0	IN	Button pin 0
TX	OUT	UART serial transmit
RX	IN	UART serial receive
MISO	IN	SPI Main In Secondary Out

Pin Name	Direction	Usage
MOSI	OUT	SPI Main Out Secondary In
SCK	OUT	SPI clock
A5	IN	Analog input pin 5
A4	IN	Analog input pin 4
A3	IN	Analog input pin 3
A2	IN	Analog input pin 2
A1	IN	Analog input pin 1
A0	IN	Analog input pin 0
AREF	IN	Analog REference voltage (max input voltage)

Specifications

Electrical Characteristics

DC Characteristics

Description	Minimum	Maximum	Unit
Supply Voltage	2.5	5.5	V
Supply Current*	-	-	mA
Solar JST Charging Range**	3.94	7.18	V

*See the individual [Notecard](#) and Feather board datasheets for more details.

**For detailed information regarding the solar charging circuit calculations and behavior, please refer to the [Blues Notecarrier A Series Solar JST Input](#) application note.

Absolute Maximum Ratings

Description	Minimum	Maximum	Unit
Storage temperature	-35	70	°C
Solar JST Voltage	0	18.18	V
Solar JST Input Current	-	1250	mA

Note

Actual values may vary based on local conditions such as atmospheric conditions and distance to the cell tower.

Ordering Information

- [Notecarriers](#)[↗]
- [Development Kits](#)[↗]

Design Files

Open source hardware designs for all Notecarriers are maintained in the [note-hardware](#)  GitHub repository.

This Notecarrier's versioned folder contains the mechanical and electrical design resources for that revision, such as board drawings, dimensional PDFs, Gerber fabrication files, a BOM spreadsheet, and a STEP (`.stp` / `.step`) 3D model suitable for enclosure design and CAD integration.

Board Errata

Terms and Conditions

Visit [Blues Hardware Terms & Conditions](#)[↗].

Revision History

Author	Date	Summary
Ray Ozzie	2019-2020	Document drafted
John Wiedey	2020	Various improvements
Sean Taylor	2020	Various improvements
Zachary J. Fields	01 OCT 2020	Updated information and translated to markdown
Brandon Satrom	04 JAN 2021	Added link to design resources
Greg Wolff	13 JAN 2021	Added BAT pin information to Notecarrier AF datasheet
Brandon Satrom	07 APR 2022	Added Notecarrier A information
Zachary J. Fields	20 JUL 2022	Added Notecarrier F information
Zachary J. Fields	24 OCT 2022	Added Notecarrier B v2 information
Rob Lauer	28 OCT 2022	Added versioning for Notecarrier B v1/v2
TJ VanToll	05 JAN 2023	Added Notecard Outboard Firmware Update information
Rob Lauer	28 FEB 2023	Re-labeling Notecarrier B as "Basic"

Author	Date	Summary
Rob Lauer	01 MAR 2023	Added PCB/Mounting Hole Dimensions
Rob Lauer	07 SEP 2023	Added Notecarrier F v1.3 information
Rob Lauer	16 NOV 2023	Added Notecarrier Pi v2.0 information
Rob Lauer	14 MAR 2024	Added Notecarrier B v3.1 and Notecarrier R v1.0 information
Rob Lauer	05 JUN 2024	Added Notecarrier XS v1.1 information
Rob Lauer	10 JUN 2024	Added KiCad schematics to A, B, F, and Pi Notecarriers
Rob Lauer	18 JUL 2024	Added Notecarrier XS v1.2 information
Rob Lauer	22 JUL 2024	Updated Notecarrier pin descriptions
TJ VanToll	19 AUG 2024	Added Notecarrier X v1.2, XM 1.2, and XP 3.1 information
Rob Lauer	14 JAN 2026	Added Notecarrier CX v1.3 information
Rob Lauer	11 FEB 2026	Added Notecarrier A v2.3 information
Rob Lauer	22 MAY 2026	Added Notecarrier CX v1.7 information

Author	Date	Summary
Rob Lauer	11 JUN 2026	Added Notecarrier XI v1.4 information
Rob Lauer	16 JUL 2026	Corrected Notecarrier XI DC specifications and Starnote for Iridium antenna details
Rob Lauer	03 AUG 2026	Add newly updated KiCad schematics

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