



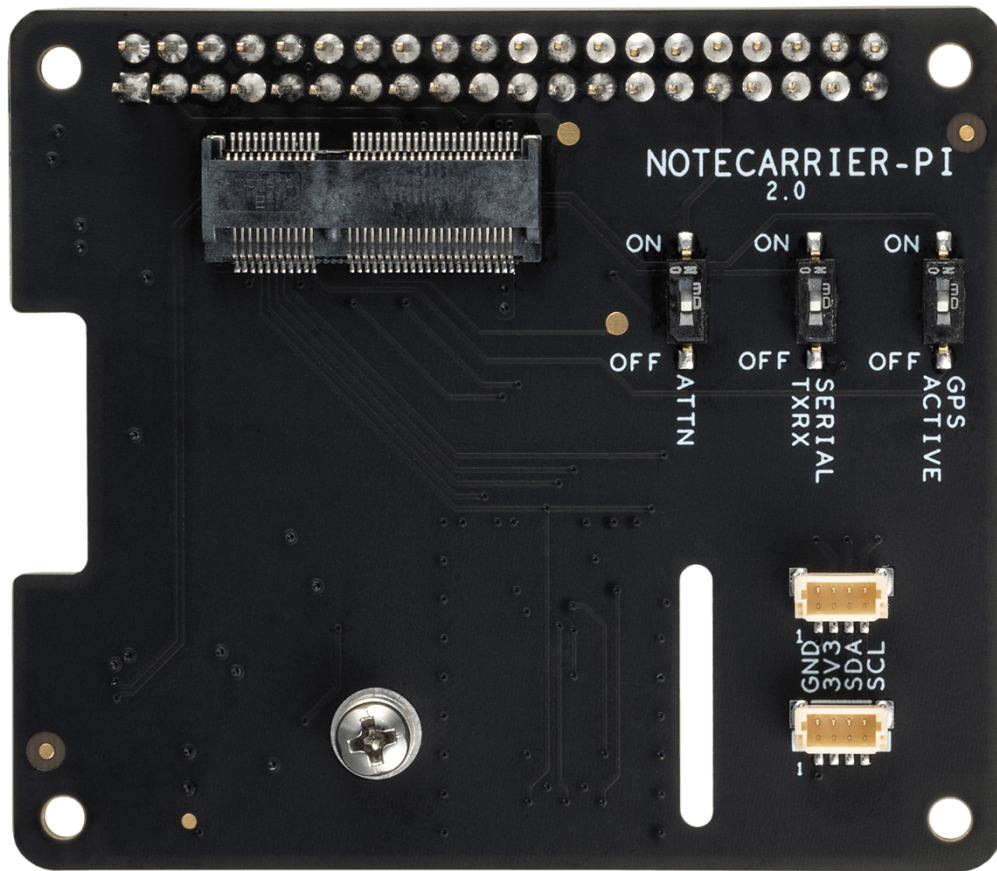
PRODUCT DATASHEET

Notecarrier Datasheet

Notecarrier Pi v2.0

Notecarrier Pi is a HAT designed for drop-in development with a Raspberry Pi or compatible single-board computer. It includes a pre-soldered stackable 40-pin header for stacking additional hats, two Qwiic ports for I2C peripherals, an external Nano-SIM slot, and u.FL connections for user-provided cellular/WiFi and GPS antennas.

Blues Notecarrier® Datasheet: Notecarrier Pi v2.0



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. However, the **Notecarrier Pi v2.0** is **compatible with all available Notecards**:

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

Differences Between Notecarrier Pi and Other Notecarriers

There are several key differences between the Notecarrier Pi and other Blues Notecarriers. Specifically, the Notecarrier Pi:

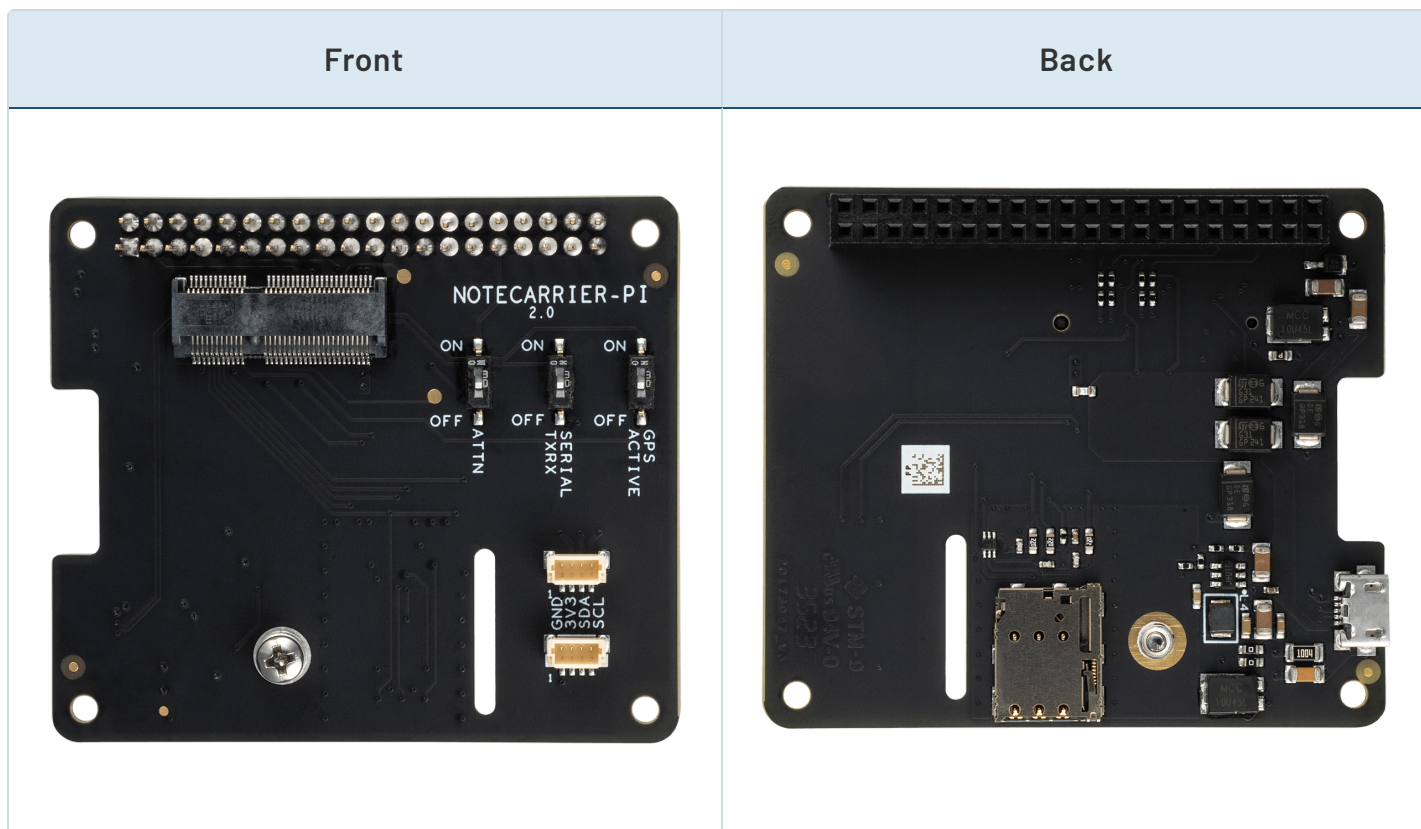
- Has no support for battery monitoring or charging.
- Supports 3V3 only and is powered directly by the Raspberry Pi.
- Doesn't offer I2C clock stretching (therefore I2C errors are more common).
- Doesn't support the Notecard's AUX 1-4 pins (therefore [card.aux](#) is not supported).
- Provides serial access via AUX RX/TX (therefore there is limited support for [card.aux.serial](#)).

Package Configuration

Notecarrier Pi (Raspberry Pi Hat) v2.0

Notecarrier Pi (CARR-PI) is designed for drop-in development with a Raspberry Pi or compatible Single Board Computer. This Notecard must be powered by a Raspberry Pi or compatible SBC.

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- Pre-soldered stackable 40-pin header for plugging directly into a Raspberry Pi and stacking additional Pi hats.
- [Notecard edge connector socket](#) and [mounting screw receptacle](#).
- Micro-USB port to power Notecarrier and provide a USB Serial command interface to Notecard.
- External [Nano-SIM](#) slot for additional carrier connectivity.
- DIP switches (shown below) to configure diagnostic serial port, attention pin, and active GPS support.
- Requires user provided U.FL cellular/WiFi antenna and optional U.FL active GPS antenna.
- PCB Dimensions: 56mm x 65mm

- Center of Mounting Holes: 52mm x 61mm (measured from the edge of the PCB to the center of the furthest mounting hole)
- 2 Qwiic ports for attaching external peripherals to your project.

Power Information

The Micro-USB port on the Notecarrier Pi is a data-only port and does not provide power to the Notecarrier. Make sure to power your project with a Raspberry Pi, or use an alternate power method, including:

- attaching a LiPo battery.

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

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

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

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 Ready

The Notecarrier B, Notecarrier Pi, and Notecarrier R models do not have integrated GPS antennas, but support active GPS by providing circuitry to enable bias voltage to be supplied.

The Notecarrier is built to support either an active or passive GPS antenna, and has a DIP switch to enable you to select your configuration. The DIP switch connects the Notecard's `VACT_GPS_OUT` to `VACT_GPS_IN` to support active GPS antennas that accept voltages in the 3.3V-4V range*.

* `VACT_GPS_OUT` is only powered when the cellular modem is active.

Header Descriptions

Notecarrier Pi 40-Pin Header

Notecarrier Pi is configured as a Pi Hat. As such, the Notecarrier Pi follows the standard 40-pin Raspberry Pi Model B+ layout.

Note

The Raspberry Pi [40-pin GPIO connector](#) used has 0.64mm square pins.

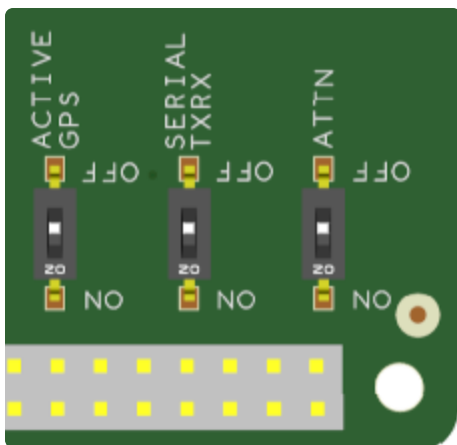
Pi 40-pin Header Pin Usage

Pin #	Pin Name	Dedicated	Description
1	3V3	N	3.3VDC power
2	5V	N	5VDC power
3	SDA	N	I2C data (Notecard has onboard 10K pull-up resistors)
4	5V	N	5VDC power
5	SCL	N	I2C clock (Notecard has onboard 10K pull-up resistors)
6	GND	N	Ground
8	AUX_RX	Y/N (DIP)	High-speed diagnostic interface
9	GND	N	Ground
10	AUX_TX	Y/N (DIP)	High-speed diagnostic interface

Pin #	Pin Name	Dedicated	Description
14	GND	N	Ground
20	GND	N	Ground
25	GND	N	Ground
30	GND	N	Ground
31	ATTN	Y/N (DIP)	Configurable interrupt signal
34	GND	N	Ground
39	GND	N	Ground

DIP Switches

There are three DIP switches are located on the board. The switches are used to reserve exclusive access to the GPIO pins.



1. **ACTIVE GPS** - When turned **ON**, applies 3.9VDC to the center conductor of the Notecard GPS antenna connector to power the low-noise amplifier (LNA) of an active GPS antenna. This switch must be **OFF** if Notecard is used with a passive GPS antenna! However, we recommend an active antenna for best performance.

2. **SERIAL_TXRX** - When turned **ON**, enables serial communication with Notecard via Notecard **AUX_RX** and **AUX_TX** via Raspberry Pi GPIOs 14 and 15 (Pins 8 and 10). Typical applications will use I2C for Notecard interactions, with this AUX serial port providing useful debugging features for developers.
3. **ATTN** - When turned **ON**, connects Notecard ATTN to Raspberry Pi GPIO 6 (Pin 31).

Specifications

Electrical Characteristics

DC Characteristics

Description	Minimum	Maximum	Unit
Supply Voltage	2.5	5.5	V
Supply Current	500	2000	mA

Absolute Maximum Ratings

Description	Minimum	Maximum	Unit
Storage temperature	-35	70	°C

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.

Here are the design files available for the **Notecarrier Pi v2.0**:

- [Schematic](#) ([.pdf](#)) – the full circuit schematic. Use it to understand how the Notecard, Raspberry Pi interface, power, and I/O are wired together.
- [PCB drawing](#) ([.pdf](#)) – a printable drawing of the PCB layers, drill details, and board outline for reference and mechanical fit.
- [PCB layout](#) ([.brd](#)) – the native Cadence Allegro board layout. Open it in Allegro/OrCAD PCB Editor to view or modify the design.
- [Gerber fabrication files](#) ([.zip](#)) – the Gerber and drill set. Send this package to a PCB manufacturer to have bare boards produced.
- [3D model](#) ([.stp](#)) – a STEP 3D model. Import it into mechanical CAD to check fit and design enclosures.
- [KiCad project \(folder\)](#)  – the complete, editable KiCad design (schematic, PCB layout, and libraries). Open it in KiCad to modify the design or generate your own outputs.

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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