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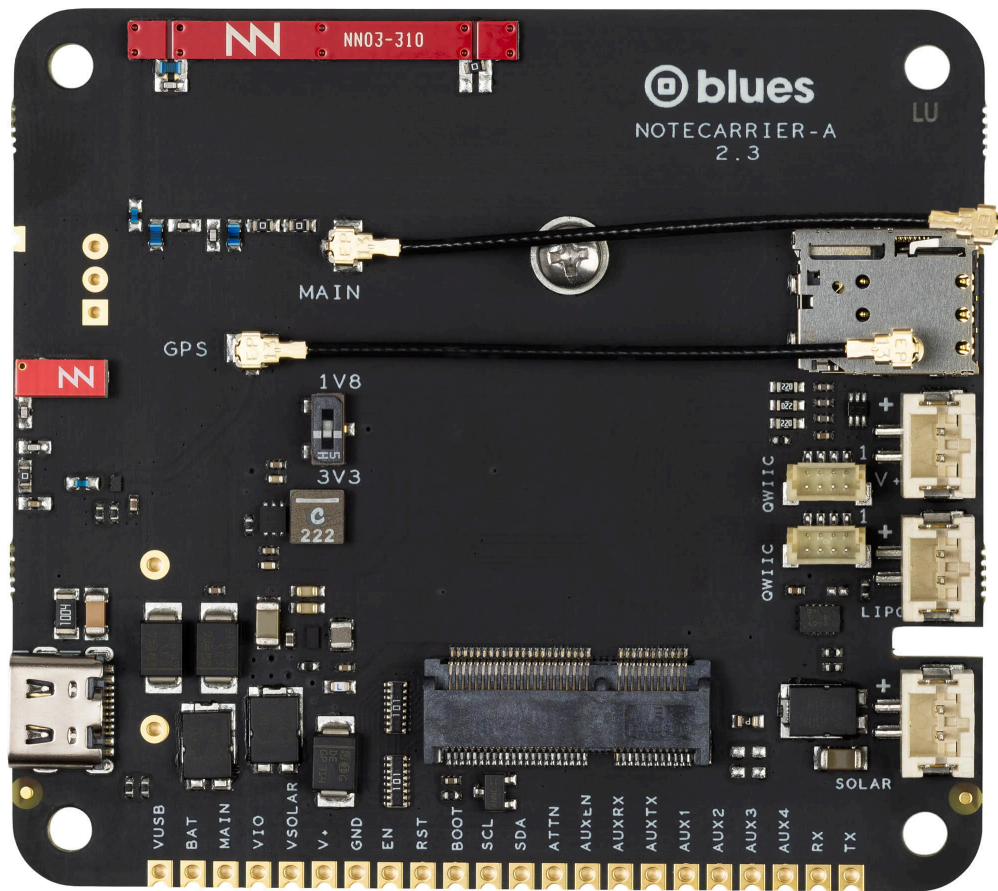
PRODUCT DATASHEET

# Notecarrier Datasheet

## Notecarrier A v2.3

Notecarrier A is designed for building battery-powered wireless applications. It includes onboard cellular/WiFi and active GPS antennas, a USB-C port for power and USB Serial access to Notecard, JST connectors for a LiPo battery and solar panel with onboard charging, and two Qwiic ports for I2C peripherals.

# Blues Notecarrier® Datasheet: Notecarrier A v2.3



## 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 A v2.3** is **compatible with all available Notecards**:

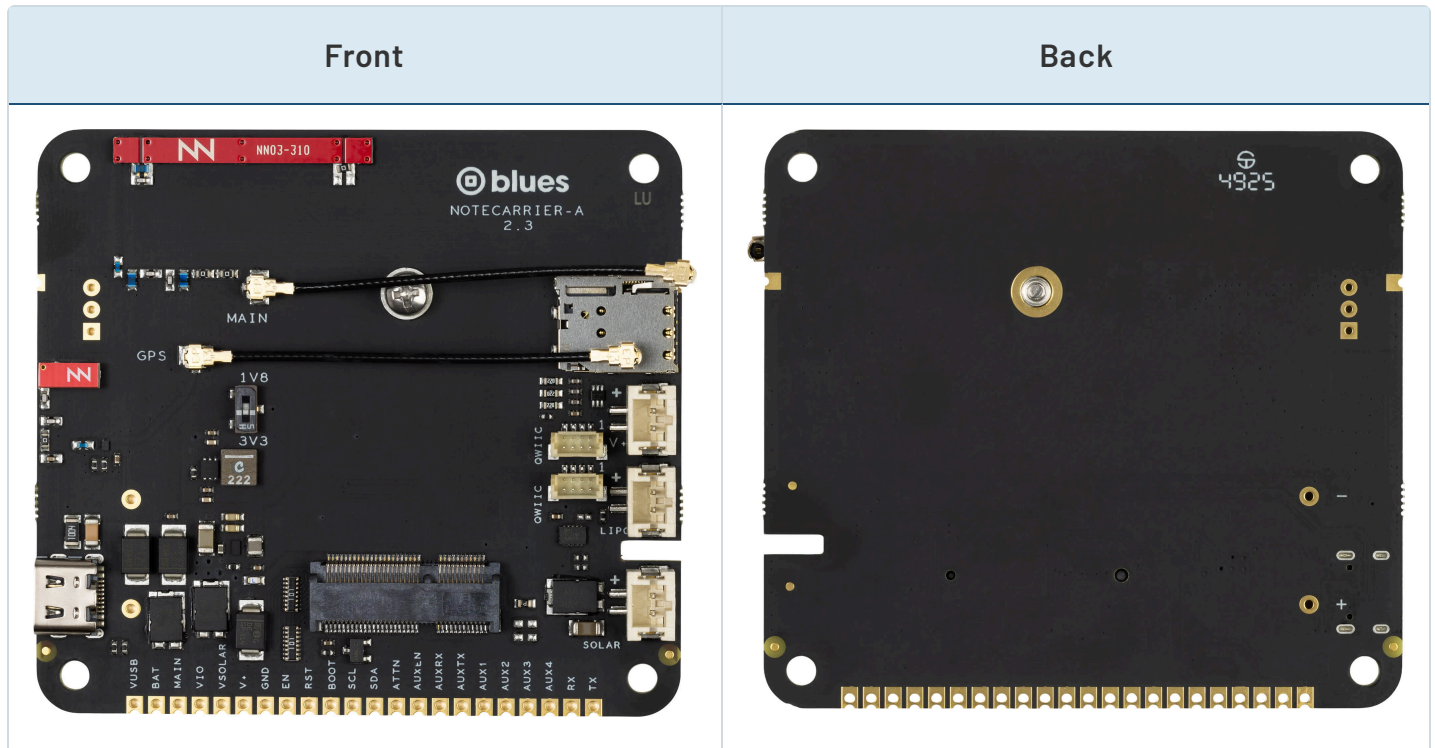
- [Notecard Cell+WiFi](#) 
- [Notecard Cellular](#) 
- [Notecard Cellular \(Legacy\)](#) 
- [Notecard WiFi](#) 
- [Notecard LoRa](#) 

# Package Configuration

## Notecarrier A (Antenna)

Notecarrier A (CARR-A) is designed for building battery-powered wireless applications.

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- Exposed [Notecarrier A 22-pin header footprint](#) for easy access to Notecard edge connector pins.
- [Notecard edge connector socket](#) and [mounting screw receptacle](#).
- USB-C 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.
- JST PH connector for a LiPo battery.
- JST PH connector for a solar panel.
- Two Qwiic connectors for connecting I2C peripherals.
- LiPo charging circuit.
- PCB Dimensions: 68mm x 75mm
- Center of Mounting Holes: 64mm x 71mm (measured from the edge of the PCB to the center of the furthest mounting hole)

# 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

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 A 22-Pin Header

[Samtec CES-122-01-T-S](#)

| Pin Name | Direction | Usage                                                                                                                                                                                     |
|----------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <VUSB    | IN/OUT    | Direct connect to VUSB pin of the USB connector                                                                                                                                           |
| <BAT     | IN/OUT    | Direct connect to the + pin of the battery connector                                                                                                                                      |
| <MAIN    | OUT       | Diode union of VUSB, VBAT, and V+ sources                                                                                                                                                 |
| <VIO     | OUT       | Digital I/O voltage source with 100mA available                                                                                                                                           |
| VSOLAR   | IN        | Solar panel input (4.5-7V) for LiPo battery charging circuit                                                                                                                              |
| V+       | IN        | 2.5-5.5V, < 8µA@5V idle, < 500mA typical, 2A surge max (GPRS)                                                                                                                             |
| GND      | IN        | Ground                                                                                                                                                                                    |
| EN       | IN        | For On/Off switching of customer product. Leave NC or connect to a physical switch or Open Drain output. Notecard will be OFF if pulled to GND. Never apply positive voltage to this pin. |
| RST      | IN        | For development use only: MUST normally be NC or High Impedance and must never be pulled to GND. A VIO-level pulse of >250ms will reset the Notecard.                                     |
| BOOT     | IN        | Access to Notecard boot pin                                                                                                                                                               |
| SCL      | IN/OUT    | I2C clock request interface (Notecard has onboard 10K pull-up resistors)                                                                                                                  |

| Pin Name | Direction | Usage                                                                              |
|----------|-----------|------------------------------------------------------------------------------------|
| SDA      | IN/OUT    | I2C data request interface (Notecard has onboard 10K pull-up resistors)            |
| ATTN     | OUT       | Configurable interrupt signal                                                      |
| AUXEN    | IN/OUT    | API-selectable <a href="#">modes of operation</a>                                  |
| AUXRX    | IN/OUT    | API-selectable <a href="#">modes of operation</a>                                  |
| AUXTX    | IN/OUT    | API-selectable <a href="#">modes of operation</a>                                  |
| AUX1     | IN/OUT    | API-selectable <a href="#">modes of operation</a>                                  |
| AUX2     | IN/OUT    | API-selectable <a href="#">modes of operation</a>                                  |
| AUX3     | IN/OUT    | API-selectable <a href="#">modes of operation</a>                                  |
| AUX4     | IN/OUT    | API-selectable <a href="#">modes of operation</a>                                  |
| RX       | IN        | UART serial receive request interface (Notecard has onboard 10K pull-up resistors) |
| TX       | OUT       | UART serial transmit request interface                                             |



# Specifications

## Electrical Characteristics

### DC Characteristics

| Description                | Minimum | Maximum | Unit |
|----------------------------|---------|---------|------|
| Supply Voltage             | 2.5     | 5.5     | V    |
| Supply Current             | 500     | 2000    | mA   |
| Solar JST Charging Range** | 3.94    | 7.18    | V    |

\*\*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.

Here are the design files available for the **Notecarrier A v2.3**:

- [PCB layout \(.brd\)](#) – the native Cadence Allegro board layout. Open it in Allegro/OrCAD PCB Editor to view or modify the copper, placement, and routing.
- [PCB drawing \(.pdf\)](#) – a printable drawing of the PCB layers, drill details, and board outline for reference and mechanical fit.
- [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 of the board. Import it into mechanical CAD to check fit and design enclosures.
- [KiCad project \(folder\)](#) – an **in-progress** KiCad port. The schematic sheets are finished, but the PCB layout is not fab-accurate and must not be used to manufacture a board – see the caveats below and the port's [status notice](#).

# Board Errata

# Terms and Conditions

Visit [Blues Hardware Terms & Conditions](#)<sup>↗</sup>.

# 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<br>2026 | Added Notecarrier XI v1.4 information                                               |
| Rob Lauer | 16 JUL<br>2026 | Corrected Notecarrier XI DC specifications and Starnote for Iridium antenna details |
| Rob Lauer | 03 AUG<br>2026 | Add newly updated KiCad schematics                                                  |



# Contact Information

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