PRODUCT DATASHEET

Notecarrier Datasheet

Notecarrier AL

Notecarrier AL is designed for building battery-powered wireless applications. It includes onboard cellular/WiFi and active GPS antennas, a pre-soldered 22-pin header for easy access to Notecard edge connector pins, JST connectors for a LiPo battery and solar panel, and an onboard LiPo charging circuit.

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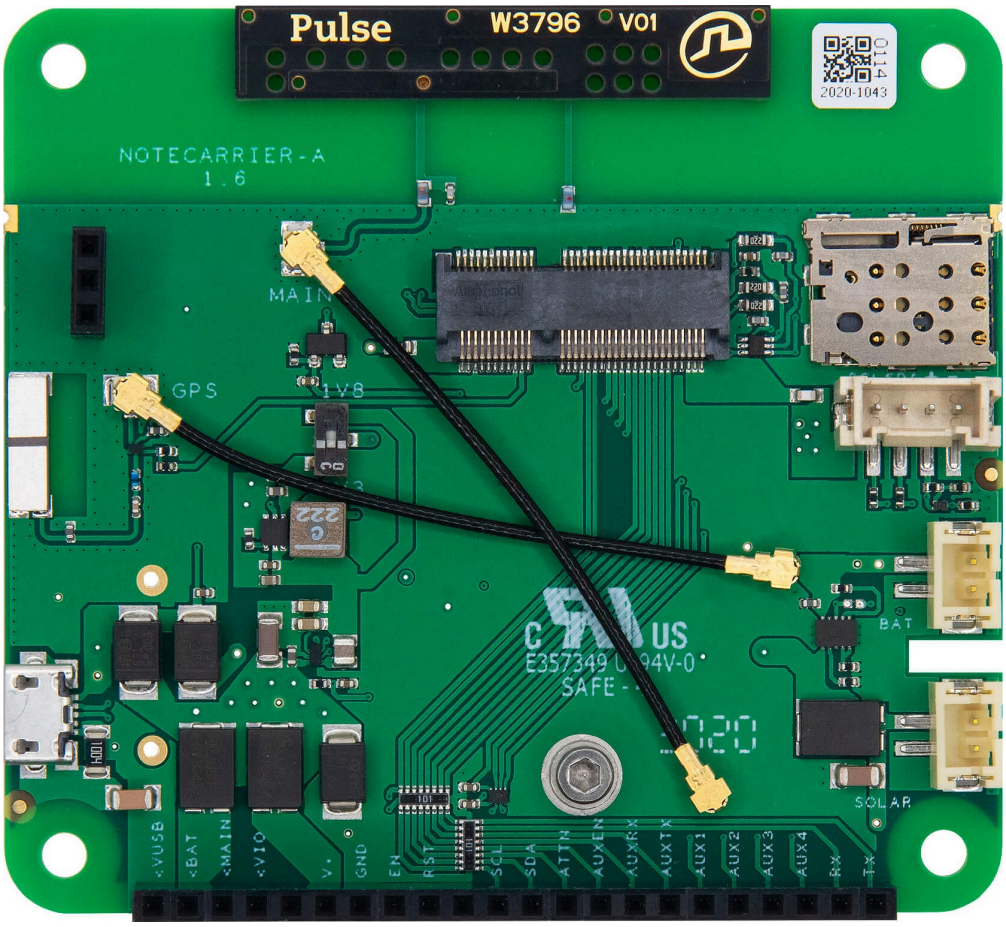
Blues Notecarrier® Datasheet: Notecarrier AL



Warning

While this product is still supported, it is no longer available for purchase from the Blues store. We recommend the Notecarrier A v2.3 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.

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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.** Breaks out Notecard's I2C and serial interfaces for direct connection to a host MCU or single-board computer.
- **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 AL** is compatible with:

- Notecard Cellular
- Notecard Cellular (Legacy)
- Notecard WiFi
- Notecard LoRa

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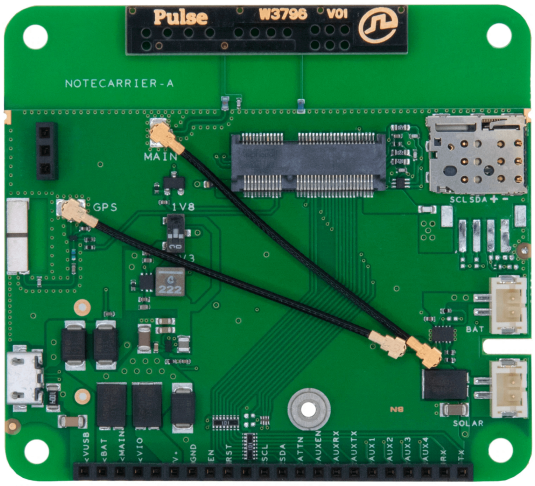
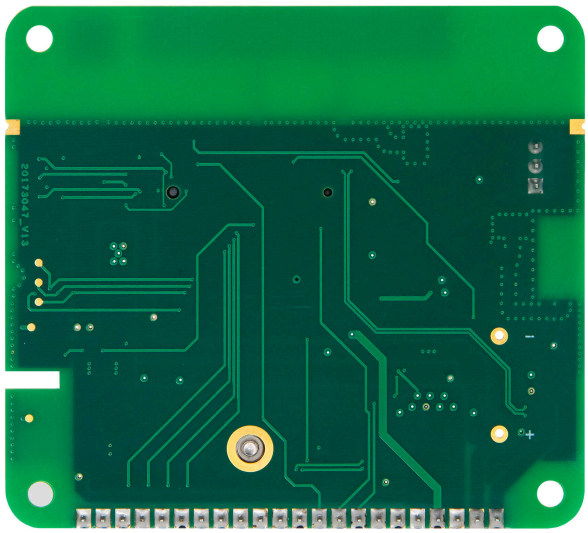
Package Configuration

Notecarrier AL (Antenna + LiPo Battery Connector)

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

Front	Back
	

- Pre-soldered female Notecarrier AL 22-pin header for easy access to Notecard edge connector pins.
- 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.
- JST PH connector for a LiPo battery.
- JST PH connector for a solar panel.
- LiPo charging circuit.
- PCB Dimensions: 68mm x 75mm

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- Center of Mounting Holes: 59mm x 66mm (measured from the edge of the PCB to the center of the furthest mounting hole)

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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 a 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.

USB, the LiPo battery, and `V+` are combined through a diode union to supply `VMAIN`, so you can connect more than one of these sources at the same time (for example, USB and `V+`) without one back-feeding the other.

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).

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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.

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Header Descriptions

Notecarrier AL 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)

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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 modes of operation
AUXRX	IN/OUT	API-selectable modes of operation
AUXTX	IN/OUT	API-selectable modes of operation
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
RX	IN	UART serial receive request interface (Notecard has onboard 10K pull-up resistors)
TX	OUT	UART serial transmit request interface

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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

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Ordering Information

- Notecarriers
- Development Kits

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Design Files

Open source hardware designs for all Notecarriers are maintained in the note-hardware GitHub repository.

The design files for the **Notecarrier AL**, such as schematics, board drawings, Gerber fabrication files, a BOM spreadsheet, and a STEP 3D model, are in the following folder of the note-hardware repository:

- _Legacy Hardware/Notecarrier-AL

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Board Errata

No board errata are currently documented for the **Notecarrier AL**.

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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

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Author	Date	Summary
Rob Lauer	28 FEB 2023	Re-labeling Notecarrier B as "Basic"
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

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Author	Date	Summary
Rob Lauer	11 FEB 2026	Added Notecarrier A v2.3 information
Rob Lauer	22 MAY 2026	Added Notecarrier CX v1.7 information
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
Rob Lauer	19 AUG 2026	Added Notecarrier XI v1.4 board errata
Rob Lauer	16 SEP 2026	Added Notecarrier F v1.5 information
Rob Lauer	18 SEP 2026	Replaced the Notecarrier F v1.3 KiCad schematics with the validated Altium conversion
TJ VanToll	21 SEP 2026	Updated Notecarrier F v1.5 pins for Notecard Outboard Firmware Update
Rob Lauer	21 OCT 2026	Corrected power input, header pin, and active GPS details for Notecarrier Pi, B, R, X, XS, XI, XM, XP, and CX

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