



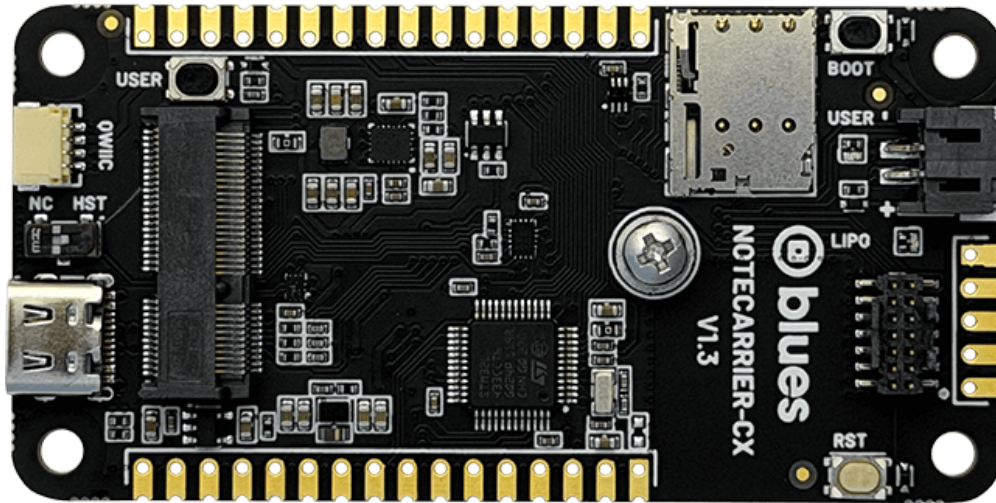
PRODUCT DATASHEET

Notecarrier Datasheet

Notecarrier CX v1.3

Notecarrier CX is a small form factor Notecarrier that pairs Notecard with a pre-soldered STM32L433 host MCU, the same part used on Blues Cygnet. It includes a JTAG debug jack, RST and BOOT buttons for bootloader access, a DIP switch toggling USB-C between Notecard and the STM32 host, LiPo battery support with onboard charging, and a Qwiic port for I2C peripherals.

Blues Notecarrier® Datasheet: Notecarrier CX v1.3



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.
- **Notecard Outboard Firmware Update.** Capable of updating host firmware without relying on the currently executing host firmware. Requires configuring the Notecard for Outboard Firmware Update before deployment. See [Notecard Outboard Firmware Update](#) for setup instructions.

Compatible Notecards

Due to differences in the physical size of Notecards, certain Notecarriers are only compatible with certain Notecards. However, the **Notecarrier CX v1.3** is **compatible with all available Notecards**:

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

Package Configuration

Notecarrier CX v1.3

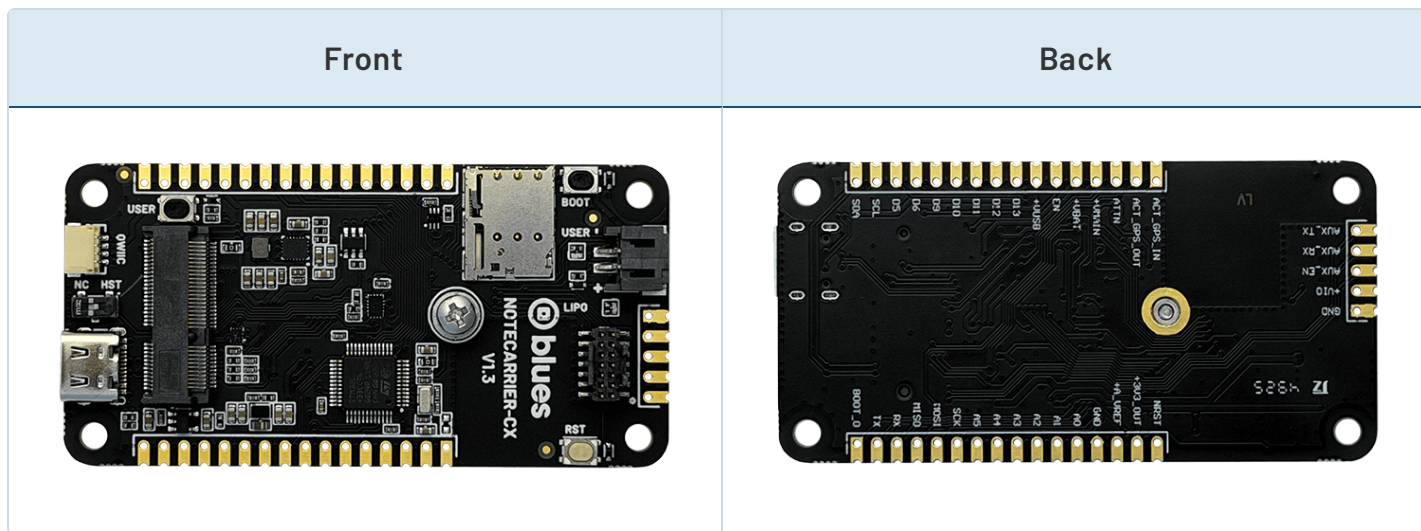
Notecarrier CX is a small form factor Notecarrier based on the Notecarrier X. However, Notecarrier CX also includes a pre-soldered and wired STM32L433 MCU (the same part used in [Blues Cygnet](#)) along with an onboard JTAG debug jack, a DIP switch for toggling USB-C between the Notecard and STM32 host, and **RST** and **BOOT** buttons for bootloader access.

Notecarrier CX also includes JST connectors for LiPo battery and charging support, as well as a Qwiic port for connecting to peripherals over I2C.

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Note

Consult the [Cygnet datasheet](#) for additional information about the STM32L433 included on the Notecarrier CX.



- [Notecard edge connector socket](#) and [mounting screw receptacle](#).
- Onboard STM32L433CCU6 Host MCU (80 MHz Clock, 256 KB Flash, 64KB of SRAM).
- USB-C port to power Notecarrier and provide a USB Serial command interface to Notecard or STM32 host (specified via onboard DIP switch).

- JST PH connector for a LiPo battery and a LiPo charging circuit.
- Qwiic connector for connecting I2C peripherals.
- `USER_BTN` programmable button.
- A yellow charging-status LED that lights when the onboard LiPo charger is actively charging a connected battery, and a red `LED_BUILTIN` LED tied to pin `PA8` of the onboard STM32L433 host MCU, controllable from host firmware (for example, with `digitalWrite(LED_BUILTIN, HIGH)` in Arduino). See the [Notecarrier CX Quickstart](#) for an example sketch that toggles this LED.
- Castellated Edges for easy pick-and-place installation in an end product.
- JTAG (SWD capable) debug jack.
- External Nano-SIM slot for use of an optional secondary SIM.
- PCB Dimensions: 76mm x 38mm
- Center of Mounting Holes: 73mm x 34mm (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.

- applying 2.5-5.5VDC to the `VBAT` or `VMAIN` pins.

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.

Enabling Active GPS

If using Notecarrier CX v1.3 with an active GPS antenna, add a 0-Ohm 0603 jumper to the unpopulated spot next to the GPS bias pin (labeled `ACT_GPS_IN` on Notecarrier CX v1.3 and `VGPS_IN` on Notecarrier CX v1.7). This will power an active GPS LNA with a 3.8VDC bias voltage on the center conductor of its GPS u.FL connector.



Header Descriptions

Notecarrier CX Dual 16-pin Headers

Pin Name	Direction	Usage		Usage	Direction	Pin Name
NRST	IN	Active-low reset of onboard STM32		Active antenna GPS bias voltage	IN	ACT_GPS_IN
+3V3_OUT	OUT	Access to 3.3V supply voltage		Active antenna GPS 3.8V from Notecard	OUT	ACT_GPS_OUT
+V_AREF	IN	Analog reference voltage input		Configurable interrupt signal	OUT	ATTN
GND	IN	Ground		Diode union of VUSB and VBAT sources	OUT	+VMAIN
A0	IN	Analog input pin 0		Direct connect to the + pin of the battery connector	IN/OUT	+VBAT
A1	IN	Analog input pin 1		Input that gates the board's host 3.3V rail	IN	EN
A2	IN	Analog input pin 2		Direct connect to VUSB pin of the USB connector	IN/OUT	+VUSB

Pin Name	Direction	Usage		Usage	Direction	Pin Name
A3	IN	Analog input pin 3		Digital I/O pin 13	IN/OUT	D13
A4	IN	Analog input pin 4		Digital I/O pin 12	IN/OUT	D12
A5	IN	Analog input pin 5		Digital I/O pin 11	IN/OUT	D11
SCK	OUT	Serial Clock signal used by SPI bus		Digital I/O pin 10	IN/OUT	D10
MOSI (see warning)	OUT	SPI data line used to send data from SPI master to SPI slave		Digital I/O pin 9	IN/OUT	D9
MISO (see warning)	IN	SPI data line used to send data from SPI slave to SPI master		Digital I/O pin 6	IN/OUT	D6
RX	IN	UART serial receive request interface		Digital I/O pin 5	IN/OUT	D5
TX	OUT	UART serial transmit request interface		Serial Clock Line used by the I2C bus	IN/OUT	SCL

Pin Name	Direction	Usage		Usage	Direction	Pin Name
BOOT0	IN	Boot into bootloader		Serial Data Line used by the I2C bus	IN/OUT	SDA

Notecarrier CX AUX Pin Headers

Pin Name	Direction	Usage
GND	IN	Ground
VIO	OUT	Digital I/O voltage source with 100mA available
AUX_EN	IN	Enable diagnostics
AUX_RX	IN	High-speed diagnostic interface
AUX_TX	OUT	High-speed diagnostic interface

Note

The Notecard's `AUX1` , `AUX2` , `AUX3` , and `AUX4` pins are **not** broken out to the Notecarrier CX headers.

If your design requires direct access to `AUX1` – `AUX4` (for example, to wire buttons or external sensors directly to the Notecard via `card.aux`), use a Notecarrier that exposes those pins, such as Notecarrier A, F, or X.

Warning

Please note that on Notecarrier CX v1.3, the labels for the MOSI and MISO pins are swapped.

DIP Switch

A single DIP switch is located on the front of the board. This switch selects which device is connected to the USB Serial interface: the Notecard (NC) or the on-board STM32 host (HST). The Notecarrier CX must be fully powered off before changing the switch position.

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.

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

Please note that on Notecarrier CX v1.3:

1. The labels for the `MOSI` and `MISO` pins are swapped.
2. Battery charge detection is not available, so calls to `card.carrier` will not accurately report charging status.
3. Voltage sensing is not available, so calls to `card.voltage` will not work.

Note

These issues are fixed in [Notecarrier CX v1.7](#).

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

Contact Information

Blues Inc.

<https://blues.com> 

50 Dunham Ridge Suite 1650

Beverly, MA 01915

support@blues.com 

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