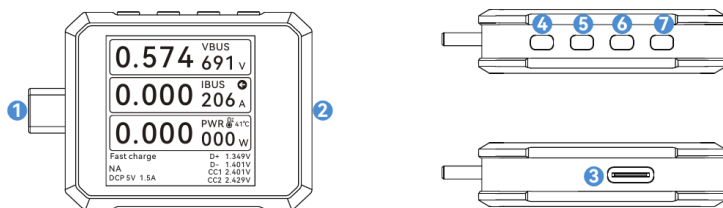




FNB-C2

USB-C tester for voltage, current
and fast-charging protocols
User Manual



❖ Please read this instruction manual carefully before using the product and keep it properly.

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1. Version & Updates

Due to the extensive functionality of the device and frequent software and hardware updates, this manual may be updated at any time. Please refer to the official website for the latest information and updates.

2. Product Overview

This user manual includes important safety information, warning notices, and common troubleshooting guidelines. Please read it carefully and follow all warnings and precautions strictly.

FNB-C2 USB-C tester is a high-reliability, high-safety USB voltage and current tester and a fast-charging protocol trigger for mobile devices. It features a 1.54-inch TFT LCD display with 240×240 ultra-high resolution and adopts an external 20-bit high-precision ADC. The PD protocol uses an external physical communication chip for secure and stable operation, with full support for PD3.1. The device can be used to measure the power supply or consumption of USB interfaces, phone chargers, and flash drives; to test smartphone charging performance and monitor the input/output status of power banks; to carry out fast-charging protocol tests and observe charger output ripple; to check whether Type-C cables contain eMarker chips and identify their current-carrying capacity; and to perform PD protocol packet capture and monitoring.

3. Safety Instructions

- Do not connect power sources exceeding 50V to the monitoring interface.
- Do not apply more than 16V to the PC connection port.
- When using the fast-charging trigger module, do not connect any device to the monitoring interface that cannot withstand high voltage.
- During high-power operation, the device may heat up. Handle with care to avoid burns.
- Do not charge your phone after triggering fast charge. The manufacturer will not be held responsible for any damage caused to your device as a result.

4. Performance Description

4.1 Interfaces

- Input Monitoring Port: USB Type-C, 24-pin Male Connector
- Output Monitoring Port: USB Type-C, 24-pin Female Connector
- PC Connection Port: USB Type-C, 24-pin Female Connector

4.2 Human-Machine Interface (HMI)

- 1.54-inch TFT-LCD display
- 4 physical buttons

4.3 Voltage & Current Measurement

- Voltage, current, and power display up to 7 digits with a maximum resolution of 0.000001 (V/A/W)
- 10 switchable sets for capacity, energy, and time statistics
- 1 set of voltage/current curve recording, supporting up to 9 hours
- Supports low-speed waveform drawing (Voltage, Current, D+, D–), with sampling rates from 2 sps to 1 ksp/s
- Supports high-speed ripple waveform (AC-coupled voltage) with sampling rates from 20 ksp/s to 2 Msp/s

4.4 Fast-Charging Trigger

- Supports QC2.0 and QC3.0 triggering
- Supports Huawei FCP and SCP triggering
- Supports Samsung AFC triggering
- Supports PD2.0 / PD3.0 triggering
- Supports UFCS triggering
- Supports OPPO (VOOC, SVOOC 1.0, SVOOC 2.0) triggering
- Supports VIVO (VFCP) triggering
- All protocols support automatic detection

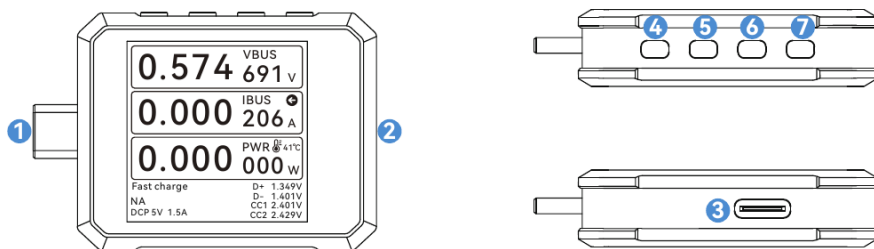
4.5 Cable Identification

- E-Marker chip detection and reading

4.6 Miscellaneous Features

- Onboard temperature measurement
- PD protocol monitoring
- Gravity sensor for automatic screen rotation; all interfaces support four-directional display
- QC-to-PD protocol conversion

5. Appearance & Structure



Parts of the device

No.	Name	Description
①	USB-C Male Connector	Standard USB Type-C male plug with full USB 4 Gen3 support. Allows bidirectional current and reversible insertion.
②	USB-C Female Port	Standard USB Type-C female socket with full USB 4 Gen3 support. Allows bidirectional current and reversible insertion.
③	HID	Connection port supporting plug-and-play (no driver required). Compatible with Windows and Mac OS platforms. Used for feature extension, firmware upgrades, and fast-charging protocol triggering.
④	Back Button	Return operation
⑤	Left Button	On the main interface: cycles through four primary display windows. In settings menu: used to adjust parameter values.
⑥	Menu/Confirm Button	Multi-function Menu Button: the function varies depending on the main interface context. Supports both short press and long press. When the device is powered off, hold this button while powering on to enter firmware upgrade mode.
⑦	Right Button	On the main interface, used to switch among four primary display screens; in the settings menu, primarily used to adjust parameter values.

6. Technical Specifications

Accuracy: $\pm(a\%(%) \text{ of reading} + N \text{ digits})$

Parameter	Range	Resolution	Accuracy
Monitoring Voltage	4-50 V	0.000001 V	$\pm(0.2 \% + 2)$
Monitoring Current	0-6.5 A	0.000001 A	$\pm(0.5 \% + 2)$
Monitoring Power	0-240 W	0.000001 W	$\pm(0.5 \% + 2)$
D+/D- Voltage	0-3.3 V	0.001 V	$\pm(1.0 \% + 2)$

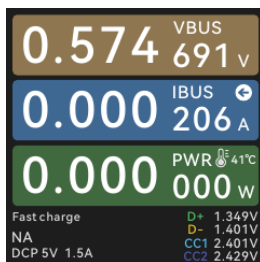
Parameter	Range	Resolution	Accuracy
CC1/CC2 Voltage	0–3.3 V	0.001 V	±(1.0 % + 2)
Device Temperature	°C	1 °C	±(1.2 % + 3)
Capacity	0–9999.99 Ah	0.00001 Ah	/
Energy Consumption	0–9999.99 Wh	0.00001 Wh	/
Recording Time	9 h 0 m 0 s	1 s	/

7. Main Interface

Unless otherwise specified, press [Left] or [Right] to switch pages, [OK] to confirm, and [Back] to return.

7.1 Dashboard Interface

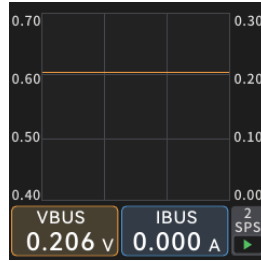
- Long-press the [OK] button on this interface to switch the sampling rate in the following cycle: 2 SPS → 10 SPS → 50 SPS → 1 kSPS
- Orange indicates the measured voltage on the line, labeled as VBUS
- Blue indicates the measured current on the line, labeled as IBUS
- Green indicates the measured power on the line, labeled as PWR
- Black indicates the detected fast-charging protocol, along with auxiliary voltage information



Dashboard interface

7.2 Real-Time Waveform Interface

- Press the [Back] button to switch between D+_D- / CC1_CC2 / VBUS_IBUS views
- Long-press the [OK] button to change the sampling rate in the following cycle: 2 SPS → 10 SPS → 50 SPS → 1 kSPS
- Short-press the [OK] button to start or pause waveform drawing

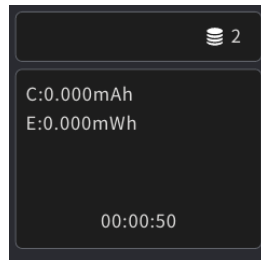


Real-time waveform

7.3 Offline Data Interface

This interface is used to record the amount of energy delivered from the power source to the device. It can be regarded as a DC energy meter, with units in mAh and mWh.

- Press the [OK] button to bring up the option: "Start a new record" / "End record"
- Short-press or long-press the [Back] button to select "Clear current group data" / "Clear all group data"



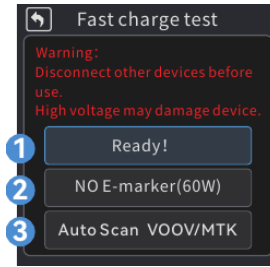
Offline data

7.4 Application Interface

► 7.4.1 Fast-Charging Protocol

Before using this function, please ensure the following preparations:

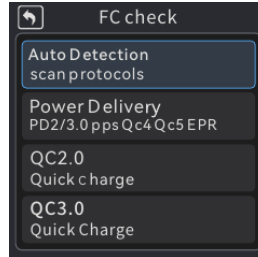
- A power source capable of continuous supply should be connected to the HID interface
- When testing PD chargers, insert the USB male connector into the charger
- After preparation, set up the corresponding Emarker cable simulation and related features
- Do not insert unrelated devices into other ports — a high-voltage request may instantly damage your device



Fast charge test

① Fast-Charging Protocol Test

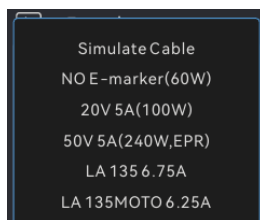
- Automatic Test Path: Application Interface > Fast-Charging Protocol > Ready > Auto Detect
- Supported protocols include: UFCS / PD2.0 / PD3.0 / QC2.0 / QC3.0 / QC4 / QC5 / FCP / SCP / AFC / VFCP / VOOC / SVOOC1.0 / SVOOC2.0 / APPLE / BC12 / MTK
- Single Fast-Charge Protocol Test: Application Interface > Fast-Charge Protocol Test > Power Delivery
- Supported protocols include: PD2.0, PD3.0, PPS, EPR, QC2.0, QC3.0, AFC, FCP, SCP, VFCP, UFCS, VOOC, SVOOC1.0, SVOOC2.0
- Unsupported protocols: MTK PE, SFCP



Fast-charging protocol check

② Cable Simulation Test

The cable simulation test allows users to emulate various cable configurations in order to test and validate device charging performance under different current and voltage conditions. Users can select different cable types as needed, and the system will output corresponding cable information to the charger based on the selected configuration.

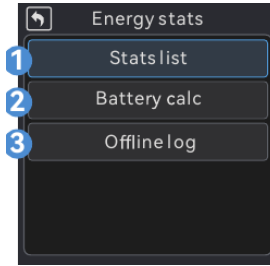


Cable simulation

③ VOOC/MTK Protocol Auto Scan

- The VOOC/MTK protocol auto scan function allows the system to automatically identify and test the VOOC and MTK fast charging protocols supported by the device.
- When enabled, the auto detection will include the following protocols: [VOOC], [SVOOC1.0], [SVOOC2.0], and [MTK]. When disabled, these protocols will be skipped during automatic detection.

► 7.4.2 Energy Statistics



Energy statistics menu

①	1. Displays the data information of each recorded group. 2. Short press the [OK] key to choose whether to continue recording or to clear the data.
②	1. Displays the data information of each recorded group. 2. Select a group number to configure and calculate two parameters: battery voltage and conversion efficiency. Battery Voltage: Adjustable range: 3.0–5.0 V Conversion Efficiency: Adjustable range: 80–100
③	1. Displays the recorded data within a specified time period. 2. Short press the [OK] key to choose: start offline recording / clear offline records / set recording duration.

► 7.4.3 Utilities

In the application interface, select the Utilities function and short-press the [OK] to enter the utilities menu. Available functions include:

USB-C eMarker – allows reading information from standard USB-C cables (3A/5A/50V/EPR/TBT3/TBT4), including: type, solution, power, length, speed, version.

PD Monitor – real-time monitoring of USB Power Delivery (PD) protocol communication. This function captures and displays data exchanged between a charging device and a powered device during PD negotiation of voltage, current, etc., helping users understand protocol operation status and troubleshoot charging compatibility issues.

QC to PD Converter – enables conversion from Qualcomm Quick Charge (QC) to USB Power Delivery (PD). When a device only supports QC and the charger primarily supports PD, this function bridges the two protocols, allowing the device to charge via PD and improving compatibility across fast-charging environments.

VBUS Waveform – displays real-time voltage waveform of the USB power bus (VBUS). The visual waveform helps users assess power supply stability and detect voltage fluctuations, ripple noise, or anomalies. Frequency range adjustable by level: 20.0 kHz → 50.0 kHz → 100.0 kHz → 200.0 kHz → 500.0 kHz → 1.0 MHz → 2.0 MHz.

► 7.4.4 Settings

Settings > Display > Screen Brightness – adjust screen brightness, range 10-100.

Settings > Display > Auto Dim – set standby screen brightness, range 10-100, default is 50.

Settings > Display > Startup Screen – enable or disable the startup page.

Settings > Display > Theme – switch background color themes.

Settings > Display > Auto Screen Rotation – enable gravity sensor to adjust screen orientation automatically.

Settings > Storage > Save Interval – set the interval to record data, from 1 to 120 seconds.

Settings > Storage > Start Condition – disabled by default. Set an appropriate value to automatically trigger recording start.

Settings > Storage > Stop Condition – set a suitable value to automatically stop recording; ideal for monitoring charging curves of mobile devices.

Settings > Storage > Energy Statistics – set the recording duration in the “Offline Data” interface. Recording will stop when the set time is reached.

Settings > Storage > Offline Recording – set the recording time for “Offline Records” under Energy Statistics.

Settings > Language – switch the interface display language as needed.

Settings > About – view detailed device information, firmware version, etc.

Reset All Settings – restore all settings to factory defaults.

7.5 Firmware Upgrade Instructions

- While the device is powered off, press and hold the [OK] button, then connect the power to enter the firmware upgrade screen;
- Connect the device to a computer using a USB Type-C data cable;
- The computer will automatically recognize the device as a USB drive—simply drag the firmware file into the drive;
- The device will reboot automatically once the upgrade is complete.

8. Information for the EU and Czech Market

8.1 Importer and responsible person in the EU

The product is placed on the European Union market by the importer stated below, who is at the same time the responsible person within the meaning of Article 16 of Regulation (EU) 2023/988 of the European Parliament and of the Council on general product safety (GPSR).

Importer / responsible person in the EU	Rotorama, s.r.o.
Company ID (IČO)	051 57 692
VAT ID (DIČ)	CZ05157692
Registered office	Okrajová 1351, 674 01 Třebíč, Czech Republic
E-mail	info@rotorاما.cz
Phone	+420 252 252 098
Website	www.rotorاما.cz

8.2 Product conformity



- The product bears the **CE** marking and complies with the requirements of the applicable European Union harmonisation legislation.
- A copy of the **EU Declaration of Conformity** is available from the importer at the address stated above or at the e-mail address info@rotorاما.cz.
- **Product identification:** the type designation (FNB-C2) and the serial number are given on the rating label on the back of the device; the firmware version number can be found in *Settings* → *About*.

8.3 Disposal of electrical equipment



- The crossed-out wheeled bin symbol on the product, its packaging or in the documentation means that at the end of its service life the product **must not be disposed of together with mixed municipal waste**.
- Hand it over at a take-back point for electrical equipment – at a collection yard, at a take-back point of a collective system, or at the retailer when purchasing a new equivalent product. Take-back is free of charge for the end user.
- The obligations under Act No. 542/2020 Coll., on end-of-life products, are fulfilled by the importer through a collective take-back system.
- Proper disposal helps prevent negative impacts on the environment and human health and contributes to the reuse of secondary raw materials.

Through its contractual partner **ASEKOL a.s.**, the company ensures the take-back of waste electrical equipment from households and the separate collection of waste electrical equipment, batteries and accumulators in accordance with the applicable legislation. The customer is entitled to hand over old electrical equipment or a battery or accumulator at any collection point of the above contractual partner. The addresses of these take-back points are listed at www.asekol.cz, www.ecobat.cz and also <https://visoh2.mzp.cz/RegistrMistZO/RegistrMistZOPublic/MapaMistZpetOdberu>.

8.4 Manufacturer and service

Product name	USB Tester
Brand / model	FNB-C2
Manufacturer	Shenzhen FNIRSI Technology Co., Ltd.
Address	8th Floor, West Side, Building C, Weihua Da Industrial Park, Dalang Street, Longhua District, Shenzhen, Guangdong, China
Phone	0755-28020752
Service e-mail	support@fnirsi.com
Business e-mail	business@fnirsi.com
Manufacturer website	www.fnirsi.com
Standard implemented	GB/T 12116-2012

9. Warranty and rights arising from defective performance

9.1 Rights of the buyer under Czech law

The rights and obligations of the contracting parties are governed by Czech law, in particular by Act No. 89/2012 Coll., the Civil Code, and Act No. 634/1992 Coll., on consumer protection. The manufacturer's warranty terms set out below (Chapter 9.2) **do not in any way limit** the buyer's rights arising from these regulations.

- The seller is liable to the buyer for the product being free of defects on receipt. If the buyer is a consumer, a defect may be notified **within two years of receipt** of the product (Section 2165 of the Civil Code).
- If a defect appears within **one year** of receipt, the product is deemed to have been defective already at the time of receipt (Section 2161(5) of the Civil Code).
- When purchasing online, a consumer has the right to **withdraw from the contract within 14 days** of receiving the goods without giving a reason (Section 1829 of the Civil Code).
- Claims should be made with the retailer from whom you purchased the product. The importer's contact details are given in Chapter 8.1.
- The competent body for out-of-court settlement of consumer disputes is the **Czech Trade Inspection Authority**, Štěpánská 796/44, 110 00 Prague 1, www.coi.cz.

9.2 Manufacturer's warranty terms

✱ The following text is the manufacturer's original warranty statement.

Thank you for choosing our company's products. The warranty period of this product starts from the date of sale. During the product warranty period, if the product is installed and used in accordance with the product manual and used in normal environment and conditions, and the fault is caused by defects in the original materials and processing, you can enjoy free repair services according to the content of this warranty clause. Please keep your proof of purchase properly as a warranty certificate.

The following situations will incur paid repair services:

- Failure to present a valid proof of purchase;
- Damage caused by improper installation not complying with product requirements, standards, or related regulations;
- Damage caused by accessories in the installation environment that do not meet product requirements, standards, or related regulations;
- Damage caused by improper use, poor maintenance, unauthorized disassembly, or unauthorized repairs;
- Warranty period has expired.