

POWERDIAG

# PowerDiag D1L

Battery Diagnostic Adapter for Makita LXT

---

Supports LXT 14.4 V / 18 V Series

LITE

PRO

ULTRA

User Manual · Rev 1.0 · © 2025 PowerDiag

[powerdiag.jp](http://powerdiag.jp) · [support@powerdiag.jp](mailto:support@powerdiag.jp)

## Safety Information

Read all safety instructions before using this product. Failure to follow these instructions may result in electric shock, fire, or personal injury.

### !! DANGER – HIGH VOLTAGE

Makita LXT batteries operate at up to **21 V DC**. Always handle batteries with care. Do not short-circuit the battery terminals. Do not connect the adapter to a damaged or leaking battery.

### ! WARNING – ADAPTER HANDLING

- Do not disassemble, modify, or repair the adapter.
- Do not expose the adapter to moisture, liquids, or extreme temperatures (below  $-10\text{ }^{\circ}\text{C}$  or above  $50\text{ }^{\circ}\text{C}$ ).
- Do not use the adapter if the housing is cracked or damaged.
- Keep out of reach of children.
- Only connect to compatible Makita LXT batteries as listed in Section 4.

### i NOTE

This adapter is a **read-only diagnostic tool** in Lite edition. In Pro and Ultra editions, the unlock function writes a single flag to the battery BMS. This operation is logged internally and does not alter battery chemistry or safety parameters.

## Package Contents

Verify that all items listed below are present before use. Contact [support@powerdiag.jp](mailto:support@powerdiag.jp) if any item is missing.

| Item | Description   |
|------|---|
| 1×   | PowerDiag D1L adapter (Lite / Pro / Ultra as ordered) |
| 1×   | USB-A to USB-C cable, 1 m                             |
| 1×   | This user manual                                      |

### i NOTE

PC software must be downloaded separately from [powerdiag.jp/download.html](http://powerdiag.jp/download.html). No CD or USB drive is included.

## System Requirements

| Item             | Requirement                         |
|------------------|-------------------------------------|
| Operating System | Windows 10 or later (64-bit)        |
| USB Port         | USB-A 2.0 or later                  |
| Storage          | 50 MB free disk space               |
| Display          | 1280 × 720 minimum resolution       |
| Internet         | Required for software download only |

## Product Overview

The PowerDiag D1L is a compact hardware adapter that connects between a Makita LXT battery and a Windows PC. It reads diagnostic data from the battery's BMS (Battery Management System) over the proprietary Makita OneWire protocol and displays it in the PowerDiag PC application.

### Lite Edition

- Full battery data readout
- Cell voltage monitoring
- History logging (up to 200 records)
- PC export (CSV)

**Pro Edition** — includes all Lite features plus:

- Legacy battery unlock (up to 100 operations)

**Ultra Edition** — includes all Pro features plus:

- Unlimited unlock operations
- LED control (ON / OFF)
- Advanced diagnostics

## Compatible Batteries

The following Makita LXT battery models have been verified compatible. Compatibility is updated regularly; see [powerdiag.jp](http://powerdiag.jp) for the latest list.

| Voltage | Model            | Notes                           |
|---------|------------------|---------------------------------|
| 18 V    | BL1815 / BL1815N |                                 |
| 18 V    | BL1820 / BL1820B |                                 |
| 18 V    | BL1830 / BL1830B |                                 |
| 18 V    | BL1840 / BL1840B |                                 |
| 18 V    | BL1850 / BL1850B |                                 |
| 18 V    | BL1860 / BL1860B | Recommended — full data support |
| 14.4 V  | BL1430 / BL1430B |                                 |
| 14.4 V  | BL1440           |                                 |
| 14.4 V  | BL1450           |                                 |
| 14.4 V  | BL1460 / BL1460B |                                 |

### **! WARNING**

Do not connect non-LXT batteries (e.g. Makita XGT 40 V, CXT, or batteries from other brands). The adapter is designed exclusively for LXT platform batteries.

## Software Installation

1. Download the latest PowerDiag installer from [powerdiag.jp/download.html](http://powerdiag.jp/download.html).
2. Run PowerDiagSetup\_vX.X.X.exe as Administrator.
3. Follow the on-screen instructions to complete installation.
4. Connect the PowerDiag D1L adapter to your PC via the USB-C cable.
5. Windows will automatically install the required USB driver (CH343).
6. Launch **PowerDiag** from the Start menu or desktop shortcut.

### **i** NOTE

If Windows does not recognize the adapter, download the CH343 driver manually from the support page. The adapter appears as “USB-Enhanced-SERIAL CH343” in Device Manager.

## Connecting to a Battery

### **!! DANGER**

Ensure the battery is not connected to any power tool or charger before connecting to the adapter.

1. Insert the Makita LXT battery into the adapter slot. The battery slides in from the bottom, identically to inserting it into a power tool. A click confirms correct seating.
2. Connect the USB-C cable from the adapter to your PC.
3. In the PowerDiag application, select the correct COM port from the dropdown (e.g. **COM12 – USB-Enhanced-SERIAL CH343**) and click **Connect** (接続).
4. The status bar at the bottom of the application will change from **Disconnected** to **Connected**, and the live voltage reading will become active.

## Reading Battery Data

Once connected, click **Read** (読み取り) in the Battery tab. The application reads all available data from the BMS and displays it in the following sections:

- **Live Voltage** – real-time pack voltage updated continuously
- **Battery Parameters** – static data stored in the BMS
- **Battery Pack** – pack voltage and cell voltages (5 cells for 5S packs)
- **Cell Voltage** – individual cell voltages with imbalance indicator

Reading takes approximately 1–3 seconds. Results are automatically saved to the history log and can be exported as CSV.

## Data Field Reference

The following fields are displayed in the Battery Parameters panel:

| Field               | Unit  | Description                                      |
|---------------------|-------|--|
| ROM ID              | —     | Unique 16-character battery identifier           |
| Lock Status         | —     | UNLOCKED or LOCKED (legacy BMS flag)             |
| Error Code          | hex   | Active BMS fault code; 0x00 = no fault           |
| Battery Health      | %     | Estimated remaining capacity vs. design capacity |
| Charge Rate (SOC)   | %     | Current state of charge                          |
| Overdischarge Count | times | Number of deep-discharge events recorded         |
| Overload Count      | times | Number of overload events recorded               |
| Remaining Capacity  | Ah    | Calculated remaining usable capacity             |
| Temperature 1       | °C    | BMS thermistor 1 reading                         |
| Temperature 2       | °C    | BMS thermistor 2 reading                         |
| Manufacturing Date  | date  | Date of manufacture (YYYY/MM/DD)                 |
| Design Capacity     | Ah    | Rated capacity as printed on the label           |
| Charge Cycles       | times | Total charge/discharge cycle count               |

**Cell Voltages** – Individual cell voltages (Cell 1–5 for standard 5S LXT packs). The maximum cell imbalance is shown below the cell grid. An imbalance above 50 mV may indicate a degraded cell.

## Battery Unlock PRO / ULTRA

### **i** NOTE

This function is only available in **Pro** and **Ultra** editions. Attempting to use it with a Lite edition adapter will display an error.

Some Makita LXT batteries are shipped with a **Legacy Lock** flag set in the BMS. Locked batteries may display reduced capacity or refuse to operate in certain tools. The unlock function clears this flag.

### **Procedure:**

1. Connect the battery and complete a successful Read operation (Section 8).
2. Verify that **Lock Status** shows **LOCKED**.
3. Click the hamburger menu (≡) in the Battery tab and select **Unlock**.
4. Confirm the operation in the dialog box.
5. The adapter sends the unlock sequence to the BMS. The operation takes approximately 2 seconds.
6. Click **Read** again to verify that Lock Status now shows **UNLOCKED**.

### **! WARNING**

- The unlock operation is irreversible.
- Pro edition allows up to 100 unlock operations per adapter. Ultra edition is unlimited.
- Only unlock batteries you own or are authorized to service.
- PowerDiag is not responsible for any damage resulting from improper use of the unlock function.

## Troubleshooting

| Symptom  | Solution  |
|--|---|
| Adapter not recognized by PC                                   | Check USB cable. Install CH343 driver from support page. Try a different USB port.  |
| Cannot connect – COM port not shown                            | Unplug and reconnect the USB cable. Click the refresh button (↻) next to the COM port dropdown.                             |
| Read fails – “Communication error”                             | Remove and re-insert the battery. Ensure battery is charged (at least 1 bar). Try a different battery to isolate the issue. |
| All cell voltages read 0.000 V                                 | Battery may be deeply discharged or in protective shutdown. Charge the battery in an official Makita charger first.         |
| Lock Status shows UNLOCKED but battery still behaves as locked | Some tools require the battery to be removed and reinserted after unlock to refresh the lock state.                         |
| Unlock option is greyed out                                    | Your adapter is Lite edition, which does not include the unlock function.   |

## Specifications

| Parameter                   | Value   |
|-----------------------------|---|
| Compatible Battery Platform | Makita LXT 14.4 V / 18 V                          |
| Host Connection             | USB-C (USB Full Speed, CH343 bridge)              |
| Communication Protocol      | Makita proprietary OneWire (single-wire + enable) |
| Voltage Measurement         | 12-bit ADC, ±30 mV typical accuracy               |
| Operating Temperature       | 0 °C to 40 °C                                     |
| Storage Temperature         | -10 °C to 50 °C                                   |
| Dimensions                  | Approx. 85 × 65 × 40 mm                           |
| Weight                      | Approx. 80 g (without battery)                    |
| Unlock Operations           | Lite: 0 / Pro: 100 / Ultra: unlimited             |

## Legal Notices

**Trademark Notice** – Makita and LXT are registered trademarks of Makita Corporation. PowerDiag is an independent product and is not affiliated with, endorsed by, or manufactured by

Makita Corporation. All brand names are used solely for product compatibility identification (nominative use).

**Warranty** – This product is warranted against defects in materials and workmanship for 12 months from the date of purchase. This warranty does not cover damage resulting from misuse, unauthorized modification, or connection to incompatible batteries.

**Limitation of Liability** – PowerDiag shall not be liable for any incidental or consequential damages arising from use of this product. The maximum liability shall not exceed the purchase price of the product.

**Disposal** – This product contains electronic components. Do not dispose of in household waste. Dispose of in accordance with local WEEE regulations.