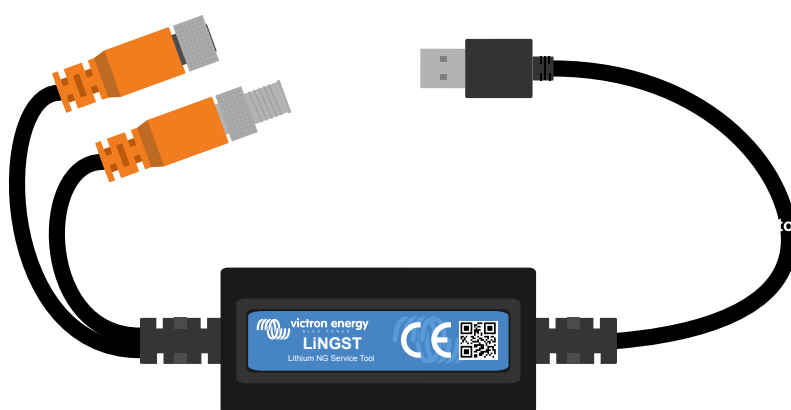




LiNGST - Lithium NG Service Tool Manual

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1. Safety precautions



This tool is intended for trained installers and service personnel only. It provides access to diagnostic and commissioning functions that go beyond standard user-accessible data.

Always follow Victron safety guidelines and ensure the system is in a safe state before connecting or disconnecting service equipment.

2. Introduction

2.1. General description

The Lithium NG Service Tool (LiNGST) provides a direct wired connection between a Windows PC and the M8 service connector on Lithium NG batteries and the BMS NG range.

It is intended for commissioning, debugging, and in-depth system analysis during installation or support work, especially in cases where wireless access is not available. The scope of this service tool is to support technical assistance during on-site activities.

2.1.1. Features

- Monitor and log data from Lithium NG batteries.
- Interact with NG BMS units by simulating an NG battery, useful for commissioning and troubleshooting even when a real NG battery is not available.
- Log data from a complete Lithium NG system setup.

2.1.2. Product variants

The Lithium NG Service Tool is available in two models:

- Lithium NG Service Tool USB-A – Part number ASS032300010
 - (USB cable: 150 cm; M8 connector lead: 20 cm)
- Lithium NG Service Tool USB-C – Part number ASS032300030
 - (USB cable: 150 cm; M8 connector lead: 20 cm)



2.1.3. Supported products

The LiNGST allows communication over the BMS cable with the following products:

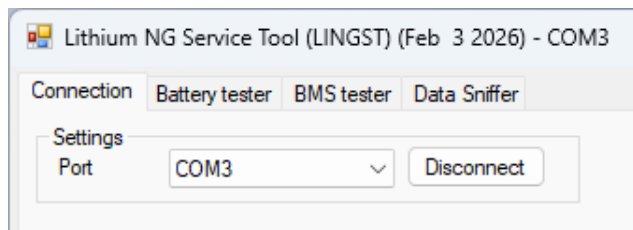
- Lithium NG battery
- Lynx Smart BMS NG 500 and Lynx Smart BMS NG 1000
- VE.Bus BMS NG
- smallBMS NG
- SmartBMS NG 12-200 (planned)

2.1.4. System requirements

- Windows PC
- Lithium NG Service Tool application for Windows (download from the [Software downloads section](#) on the Victron Energy website).

2.1.5. Initial connection

1. Connect the LiNGST to the PC
A COM port is generated automatically.
2. Open the Lithium NG Service Tool application.
3. Open the Connection tab.
4. Select the detected COM port from the drop-down list.
Once selected, the connection is established automatically.
5. Before removing the LiNGST at the end of a work session, return to the Connection tab and select Disconnect.



3. Battery tester (monitor and logger)

The Battery tester tab allows monitoring and logging of data from Lithium NG batteries.

Logging configuration

1. Select the **Battery tester** tab and, if required, adjust the sampling time using Record every (values are in milliseconds, minimum interval 1 s).
2. Select **Recording Preset** and choose the values to log from the drop-down list:
 - **Changing value only** (default) - logs only measurement.
 - **All** - logs every record, including identifier values.
 - **None** - clears the selected columns.

Manual selection is also possible using the checkboxes above each column in the table.

3. Data is displayed live in the table.
 - Each line represents the data acquired for each battery cell.
 - Current values are displayed due to the measurement redundancy internally collected. The measurements have different accuracy along the current range.
 - Serial, firmware, ProdID and BootLoader are relevant reference for remote assistance.
4. The first column (**Select**) allows deselecting rows that are not relevant for the log.
5. Click Start Recording to begin logging the displayed values.
 - A folder Recording is created in the same location as the application.
 - A new text file **Recording_[number]** is created within the folder.
 - The data is logged with:
 - Space (SP) as the separator
 - Comma (,) as the decimal separator
 - L = low range current measurement
 - H = high range current measurement

The screenshot shows the LiNGST software interface. At the top, there's a menu bar with 'Connection', 'Battery tester', 'BMS tester', and 'Data Sniffer'. Below this, there are configuration options: 'Record every' set to 1000 ms, 'Recording Preset' set to 'Changing values only', and 'Recording saved to' set to 'None'. A 'Start Recording' button is highlighted in green. The main part of the interface is a table with columns: 'Select', 'Cell ID', 'Voltage', 'Current', 'Temp', 'Serial', 'Firmware', 'ProdID', and 'BootLoader'. The table contains four rows of data for different battery cells. Below the table, there is a large text area displaying the logged data in a specific format: '1 3,396 - 23,3 2 3,395 L: 0,196 23,4 3 3,396 - 23,3 4 3,397 H: 0,178 23,4'.

4. BMS tester

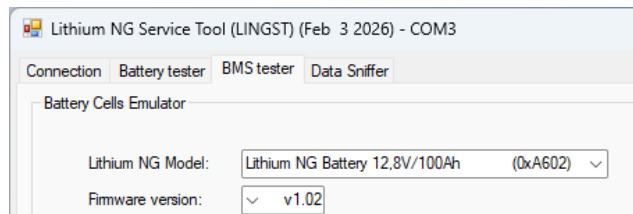
The BMS tester tab allows emulation of a Lithium NG battery. This allows BMS functionality to be inspected without a physical Lithium NG battery and is particularly useful for commissioning and troubleshooting.

The BMS tester allows inspection of BMS functions using external hardware circuits, for example:

- ATD
- ATC
- Pre-alarm
- Relay status

Setup procedure

1. Connect the LiNGST to the BMS.
2. Click the BMS tester tab and select the Lithium NG model to emulate from the drop-down list.
3. Select the firmware version of the battery.
 - Selecting the correct firmware version speeds up the connection process.
 - Selecting an incorrect firmware version only causes a delay. This occurs because the BMS may attempt to update the emulated battery if it detects an older firmware version. In this case, the BMS may be locked for a few seconds.



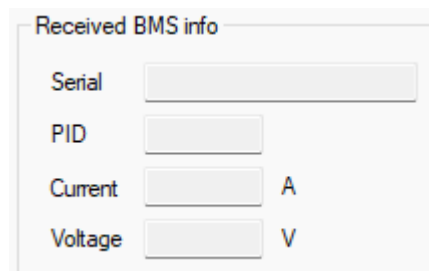
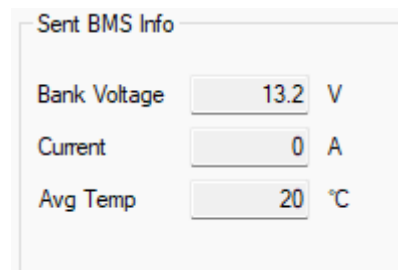
Data exchange overview

The Sent BMS Info tab displays:

- Data transmitted from the emulated battery to the BMS, including:
 - Bank voltage
 - Current
 - Avg. Temp

The Received BMS Info tab displays:

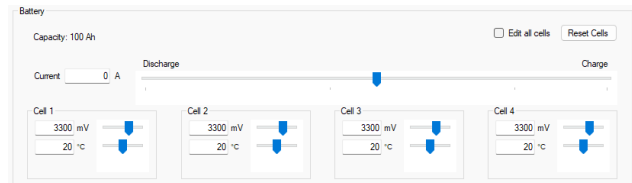
- Data received from the BMS to the emulated battery, including:
 - Serial - serial number of the BMS
 - PID - Product ID
 - Current - current measured
 - Voltage - voltage measured



Battery emulator controls

Battery current can be set using the slider or text input:

- Positive values = charge
- Negative values = discharge
- Select Edit all cells to change all cell values simultaneously.
- For each cell, voltage and temperature can be set using the slider or text input.



5. Data sniffer

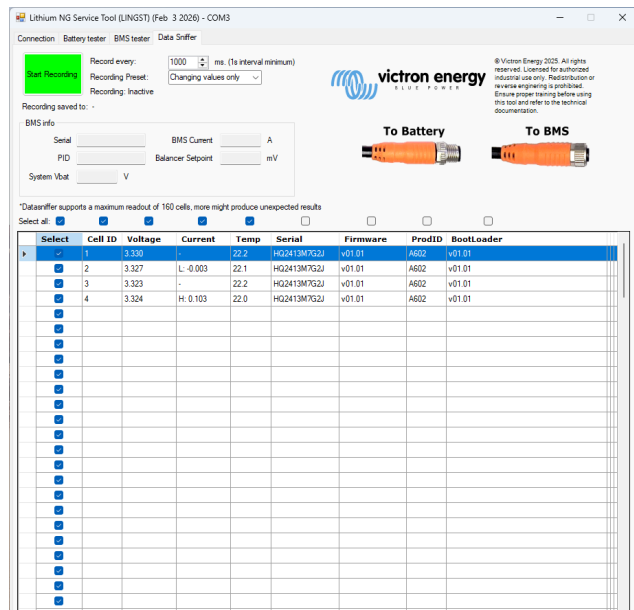
The Data sniffer function provides the same monitoring and logging capabilities as the Battery tester, but is intended for systems where multiple Lithium NG batteries are connected in a daisy chain. It allows live viewing and recording of battery data from the complete chain during commissioning, troubleshooting, and support work.

Logging configuration

1. Select the **Data sniffer** tab and, if required, adjust the sampling time using **Record every** (values are in milliseconds, minimum interval 1 s).
2. In the table, select the values to log from the drop-down list:
 - **Changing value only** (default) - logs only measurement.
 - **All** - logs every record, including identifier values.
 - **None** - clears the selected columns.

Manual selection is also possible using the checkboxes above each column.

3. Data is displayed live in the table.
 - Each line represents the data acquired for each battery cell.
 - Current values are displayed due to the measurement redundancy internally collected. The measurements have different accuracy along the current range.
 - Serial, firmware, ProdlID and BootLoader are relevant reference for remote assistance.
4. The first column (**Select**) allows deselecting rows that are not relevant for the log.
5. Click **Start Recording** to begin logging the displayed values.
 - A folder Recording is created in the same location as the application.
 - A new text file **DataSnifferRecording_[number]** is created within the folder.
 - The data is logged with:
 - Space (SP) as the separator
 - Comma (,) as the decimal separator
 - L = low range current measurement
 - H = high range current measurement



```
1 3,396 - 23,3 2 3,395 L: 0,196 23,4 3 3,396 - 23,3 4 3,397 H: 0,178 23,4
1 3,396 - 23,3 2 3,395 L: 0,197 23,4 3 3,396 - 23,3 4 3,397 H: 0,182 23,4
1 3,396 - 23,3 2 3,395 L: 0,195 23,4 3 3,396 - 23,3 4 3,397 H: 0,196 23,4
1 3,396 - 23,3 2 3,395 L: 0,196 23,4 3 3,396 - 23,3 4 3,397 H: 0,2 23,4
1 3,396 - 23,3 2 3,395 L: 0,195 23,4 3 3,396 - 23,3 4 3,397 H: 0,196 23,4
1 3,396 - 23,3 2 3,395 L: 0,193 23,4 3 3,396 - 23,3 4 3,397 H: 0,191 23,4
1 3,396 - 23,3 2 3,395 L: 0,192 23,4 3 3,396 - 23,3 4 3,397 H: 0,196 23,4
1 3,396 - 23,3 2 3,395 L: 0,192 23,4 3 3,396 - 23,3 4 3,397 H: 0,196 23,4
1 3,396 - 23,3 2 3,395 L: 0,192 23,4 3 3,396 - 23,3 4 3,397 H: 0,2 23,4
```