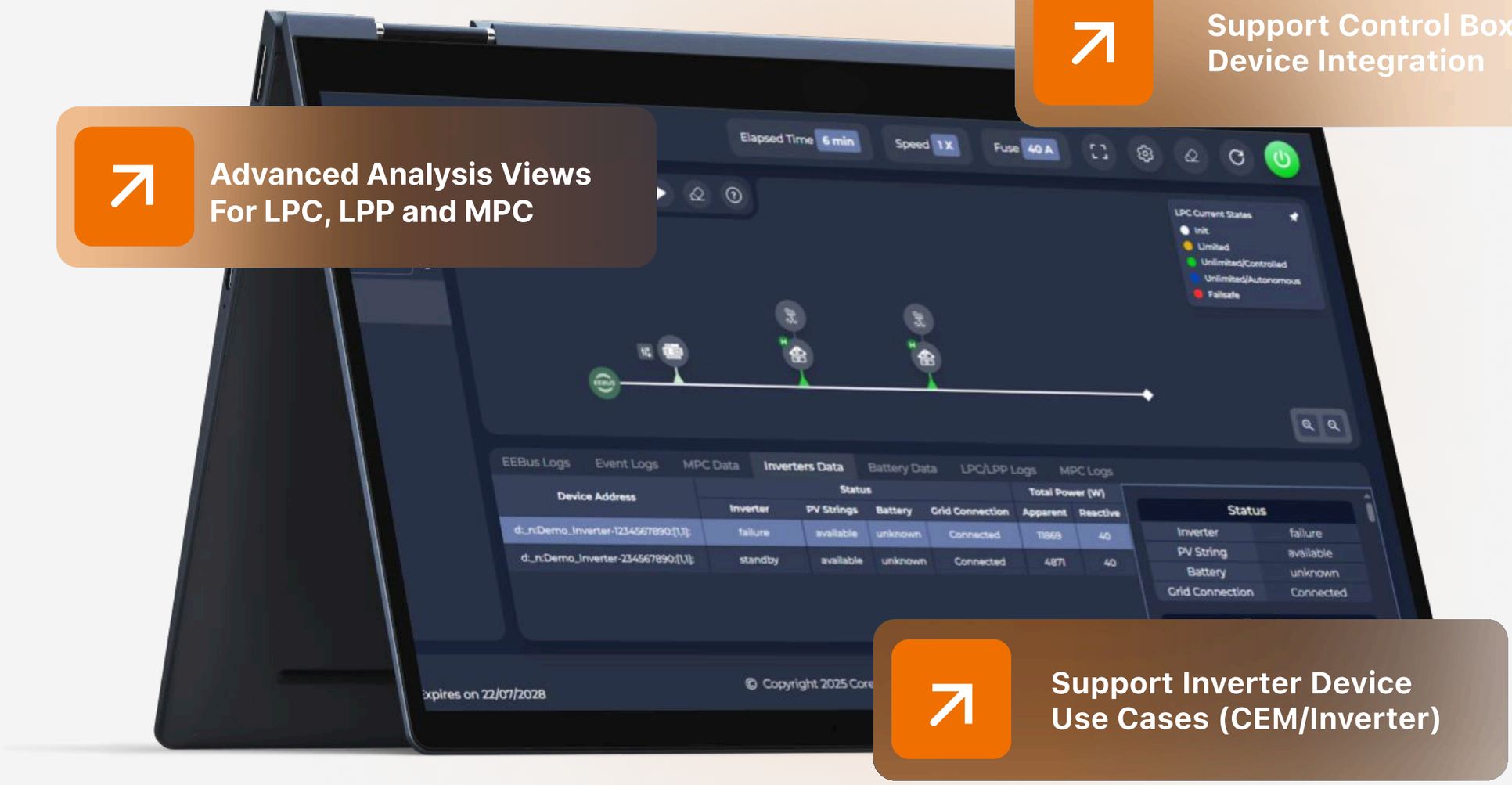
Coretech Innovations

EEBUS hub



Advanced Analysis Views For LPC, LPP and MPC

Support Control Box Device Integration

Support Inverter Device Use Cases (CEM/Inverter)

EEBUS Hub Release 1.4.0 Highlights

Your Ultimate EEBUS HiL/SiL Testing Framework Reducing the Effort of EEBUS Integrations

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Highlights of this Release

1

Support Control Box Device Integration And Cascaded HEMS Simulation

2

Support **Inverter** Device EEBUS Use Cases (CEM/Inverter)

3

Enhanced Analysis And Debugging For LPC, LPP, MPC.

- Dedicated Views With **Logging And Filtering Features**
- Display Commands LPC/LPP **Rejection Reason**

4

Display Cascaded Entities **Hierarchy** In **The UI**

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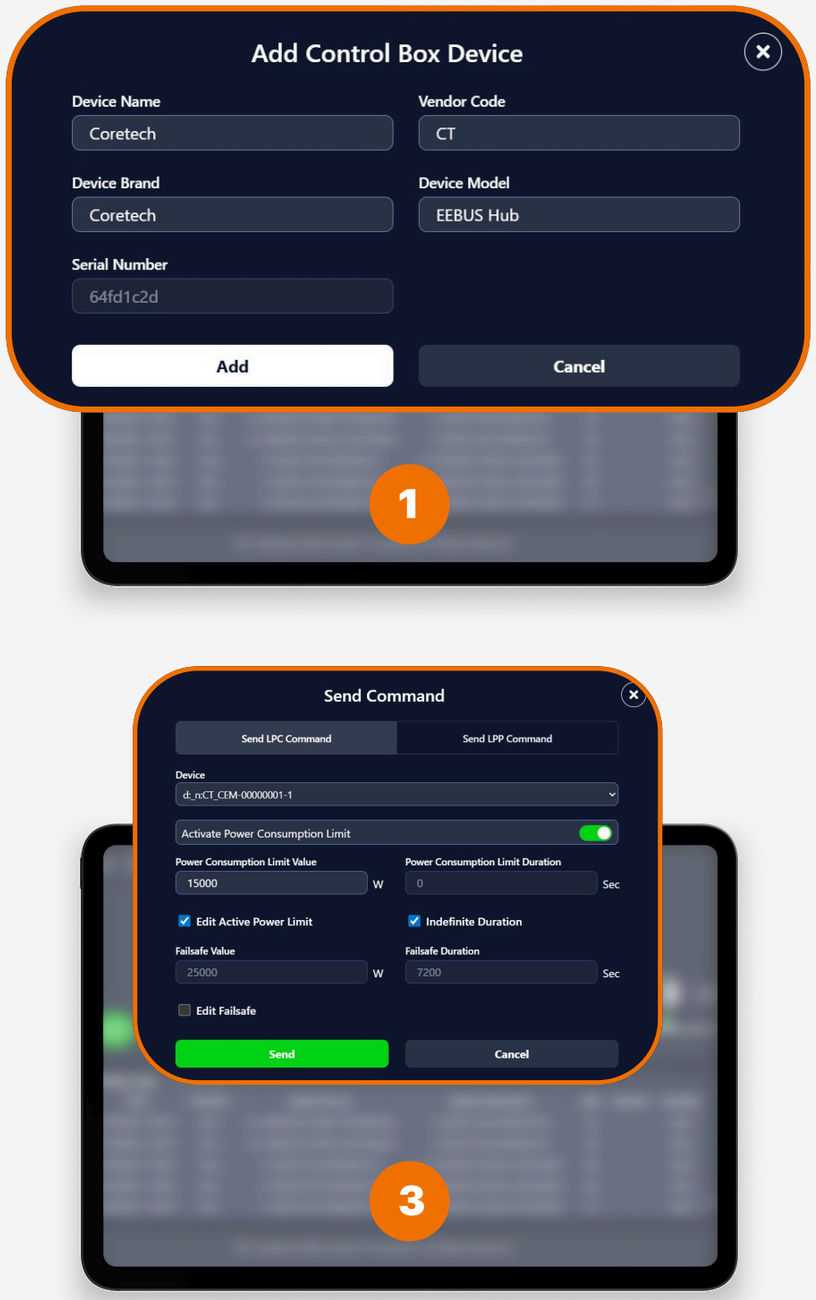
1. Support Control Box Device Simulation

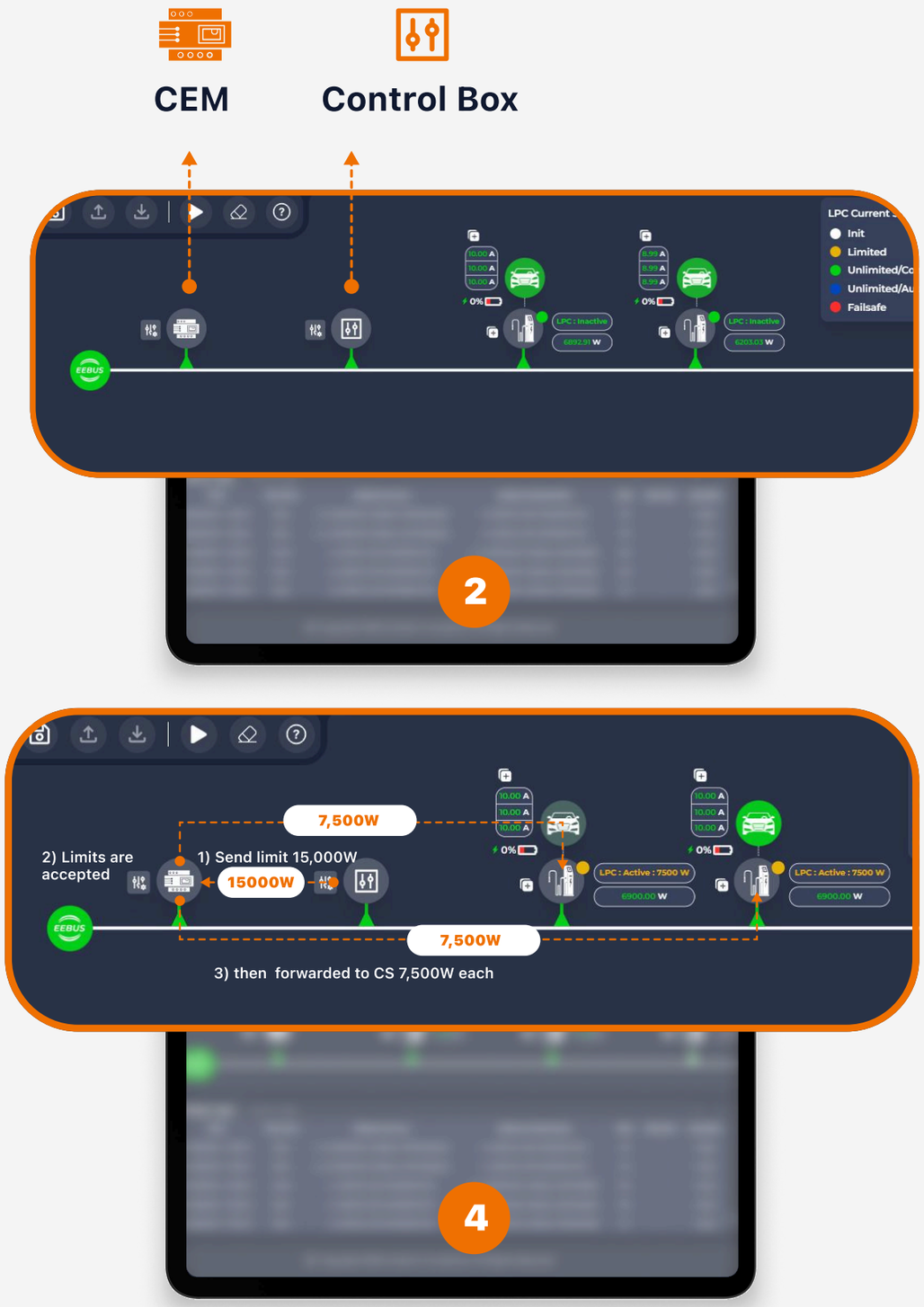
A simulated **Control Box** can now join your EEBUS networks,
sending commands to both real and simulated devices.

Adding A Control Box Device



CEM Is Requested To Be Limited **(15,000W)** Indefinitely By The Control Box

CEM Control Box



Limit **(15000W)** Is Distributed On The Devices Under The CEM **Equally**

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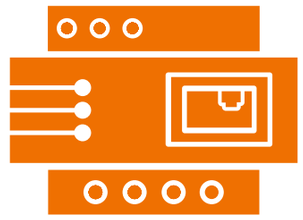
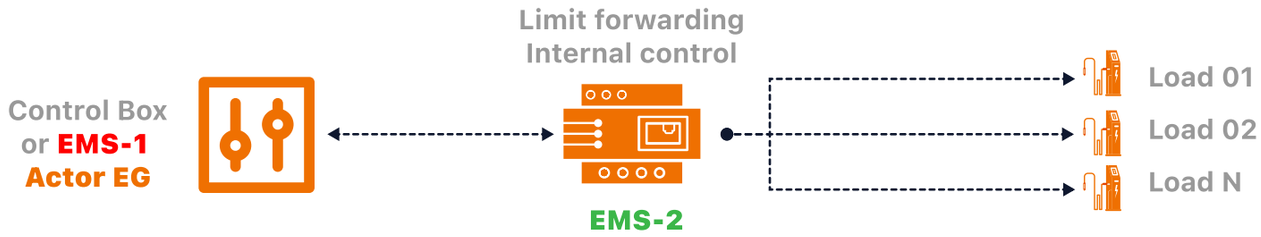
EEBUS Hub CEM can now act as a Controllable System

Simulated CEM now supports operating as Actor:

- **Energy Guard**
- **Controllable System** **New**
  This enables the simulated EMS to either be controlled by another Energy Guard or to control other systems.





- **EMS-2** acts as a controllable system in front of the **EMS-1**, which could be another EMS, SMGW or a Control box.

- **EMS-2's** role here is to accept power limits from **EMS-1** as a bulk, and forward it to the controllable systems based on any algorithm that **EMS-2** favors, as long as the bulk limit is maintained.

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2. Inverter Device Integration

The EEBUS Hub supports **inverter-related use cases** in simulation

Supported Use Cases:

- **MOI:** Monitoring of Inverter
- **MOB:** Monitoring of Battery

Upcoming:
COB, MPS, and additional use cases.

Accessible via **UI** and programmatically for **manual and automated testing.**

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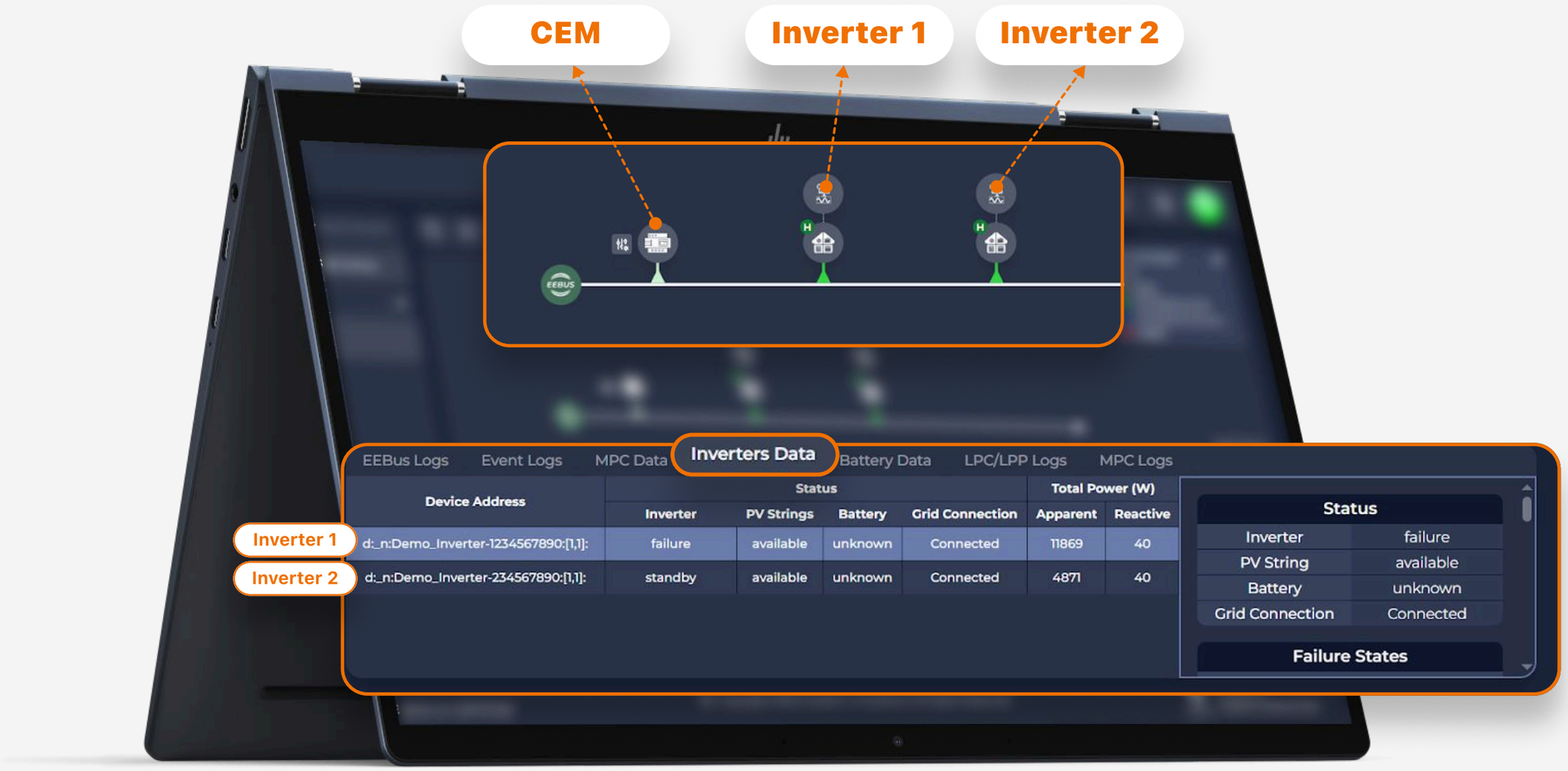
2. Inverter Device Integration

Inverters Use case: Monitoring of Inverter



The EEBUS Hub Energy Manager supports **MOI and MOB** use cases and **these** use cases data can be accessed from the UI and programmatically.

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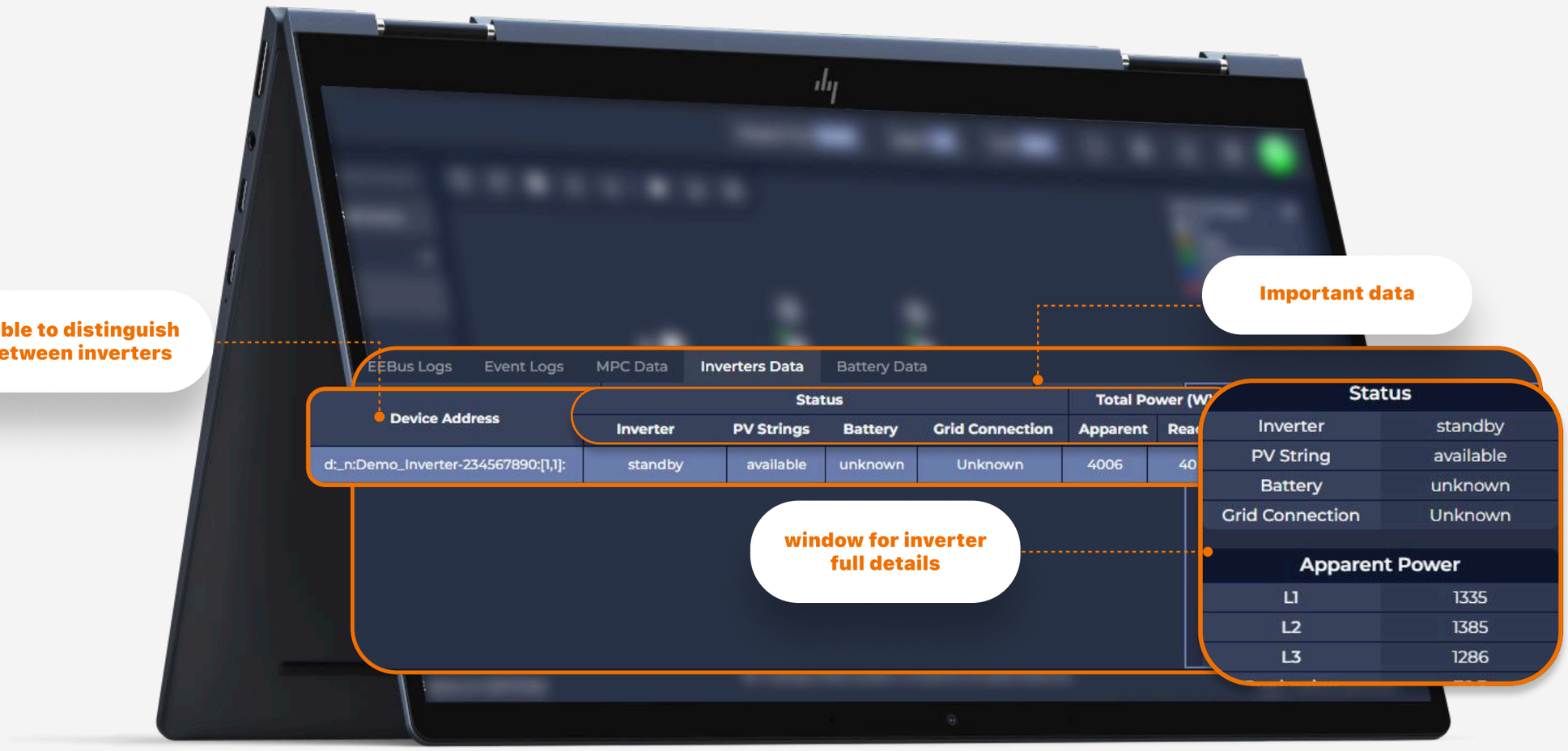
2. Inverter Device Integration

Inverters Use case (MOI) - View



The **MOI view** shows the following

1. **Table** holding the important data to distinguish between different inverters
2. **Detailed window** presenting the whole MOI data for the selected inverter
3. The **static data** for the inverter that will be shown after clicking on the inverter

The **MOI important data** are

- **Status** (inverter, PV String, Battery, Grid Connection)
- **Total Power** (Apparent, Reactive)

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2. Inverter Device Integration

Inverters Use case (MOI) - View (contd.)

Charge Power Max	85.2
Time to Charge	16
Discharge Power Min	-
Discharge Power Max	-
Time to Discharge	31
General	
Power Factor	-0.98
Temperature	70

AC Day Historical	500.5
AC Month	400
AC Month Historical	600.5
AC Year	900
AC Year Historical	700.5
Battery	
Charge Power Min	81
Charge Power Max	85.2
Time to Charge	16
Discharge Power Min	-

L2	1520
L3	1421
Production	70.3
Consumption	70.3
Total	4411
Reactive Power	
L1	-
L2	30
L3	-
Production	600.5

L2	30
L3	-
Production	600.5
Consumption	70.3
Total	40
Yields	
AC Total	36.5
AC Day	46.5
AC Day Historical	500.5
AC Month	400

Detailed Window Presenting The Whole **MOI Data** For The Selected Inverter

d:_n:Demo_Inverter-234567890

Type	Inverter
IsExternal	true
RemoteSki	23ef43d7a6487fb9a44c7fbb0d2b840514b8faa6
Address : Device	d:_n:Demo_Inverter-234567890
Address : Entity : 0	1
Address : Entity : 1	1
MOI Data	
Device Name	Inverter_001
Device Code	INV-DE-123456

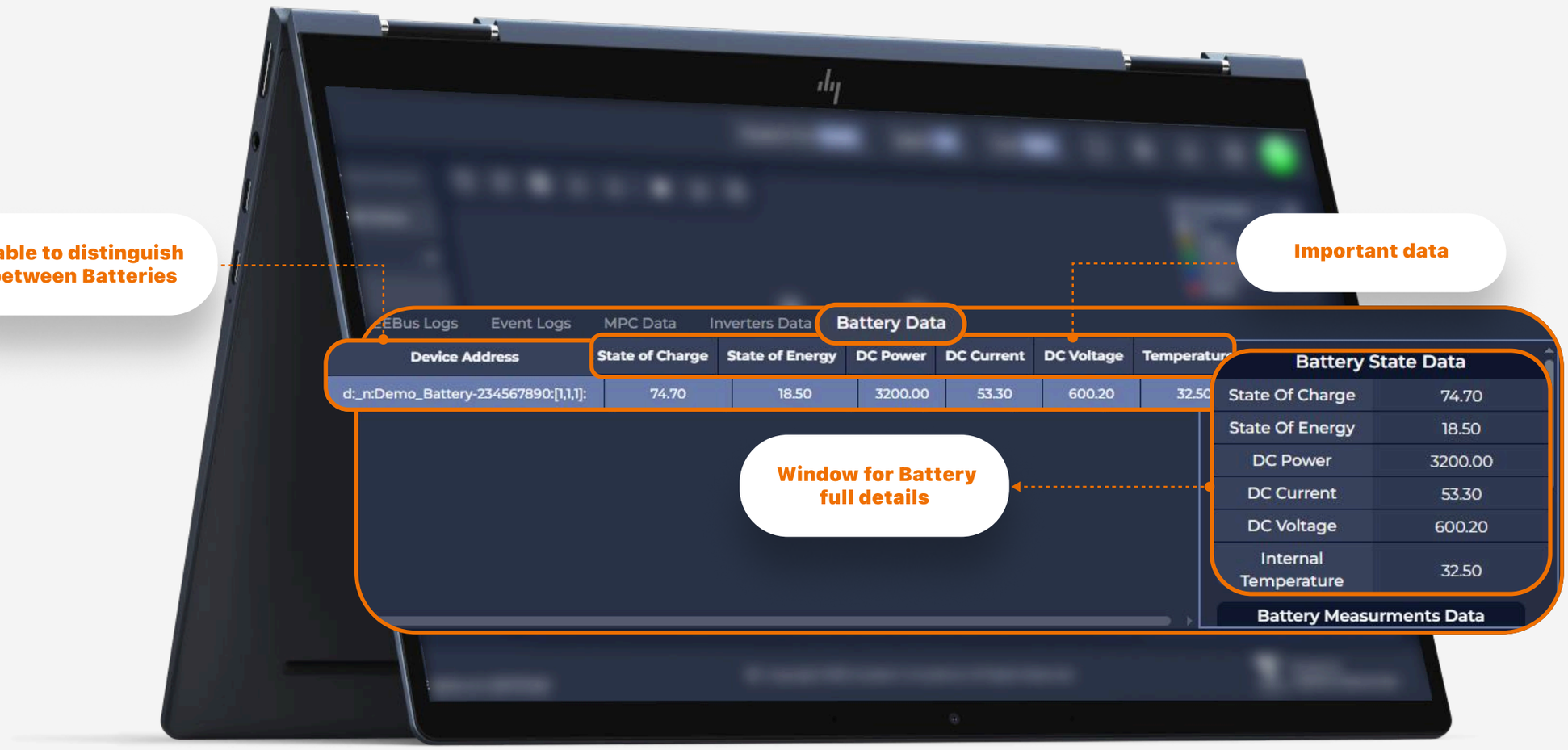
d:_n:Demo_Inverter-234567890

Serial Number	SN1234567890
Software Revision	SW1.2.3
Hardware Revision	HW2.1
Vendor Name	
Vendor Code	SMA
Brand Name	
Inverter Description	Single-phase string inverter for residential PV
ode	DE;VDE-AR-N4105;2019

Inverter Data

2. Inverter Device Integration

Inverters Use case (Monitoring of Battery)

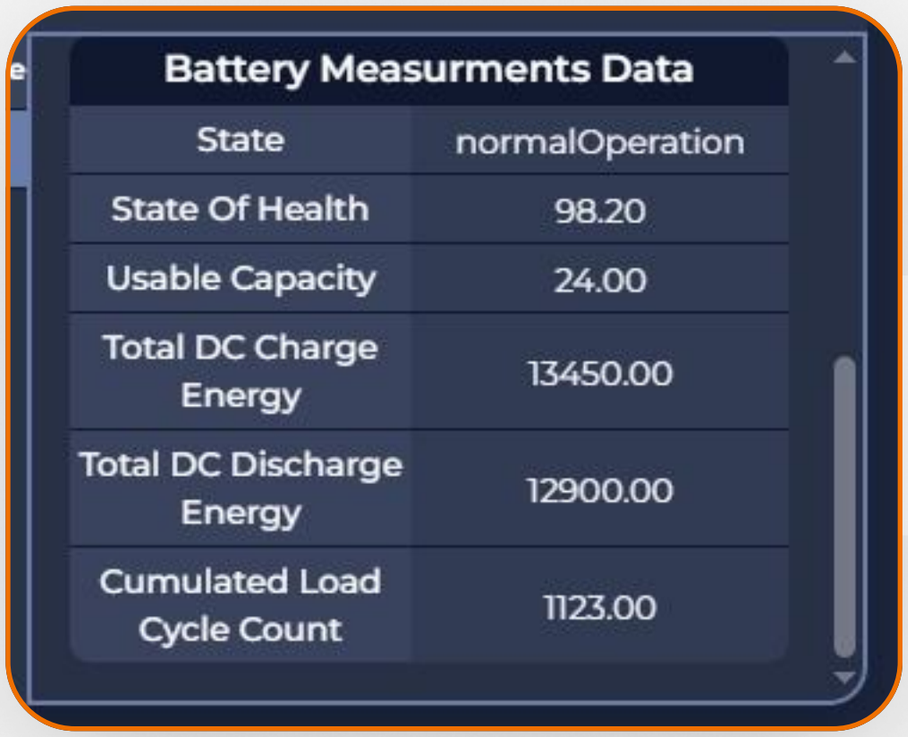


The **MOB view** shows the following

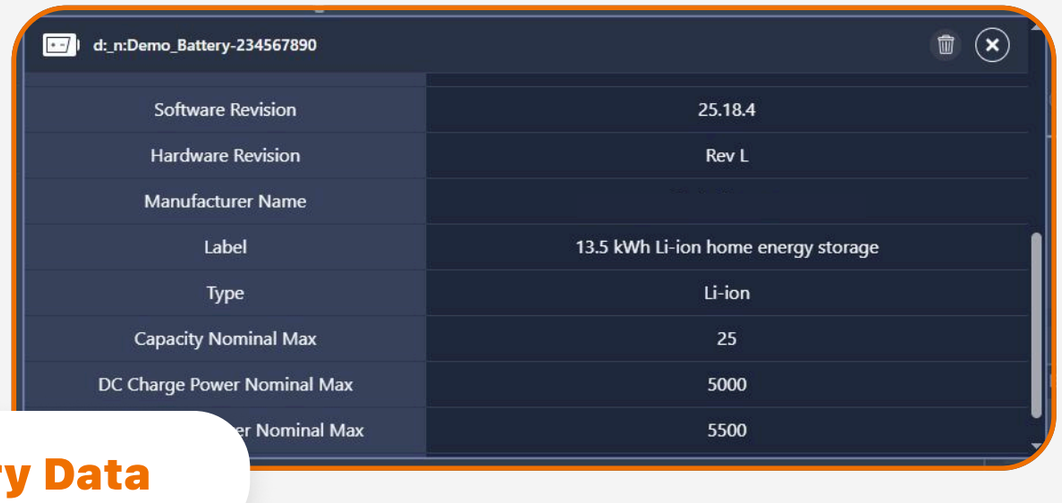
1. **Main table** holding the important data to distinguish between different batteries
2. State of Charge, State of Energy, DC (Power, Current, Voltage), Temperature **data**
3. A window presenting the complete **MOB data** for the selected battery

2. Inverter Device Integration

Inverters Use case (MOB) - View (contd.)

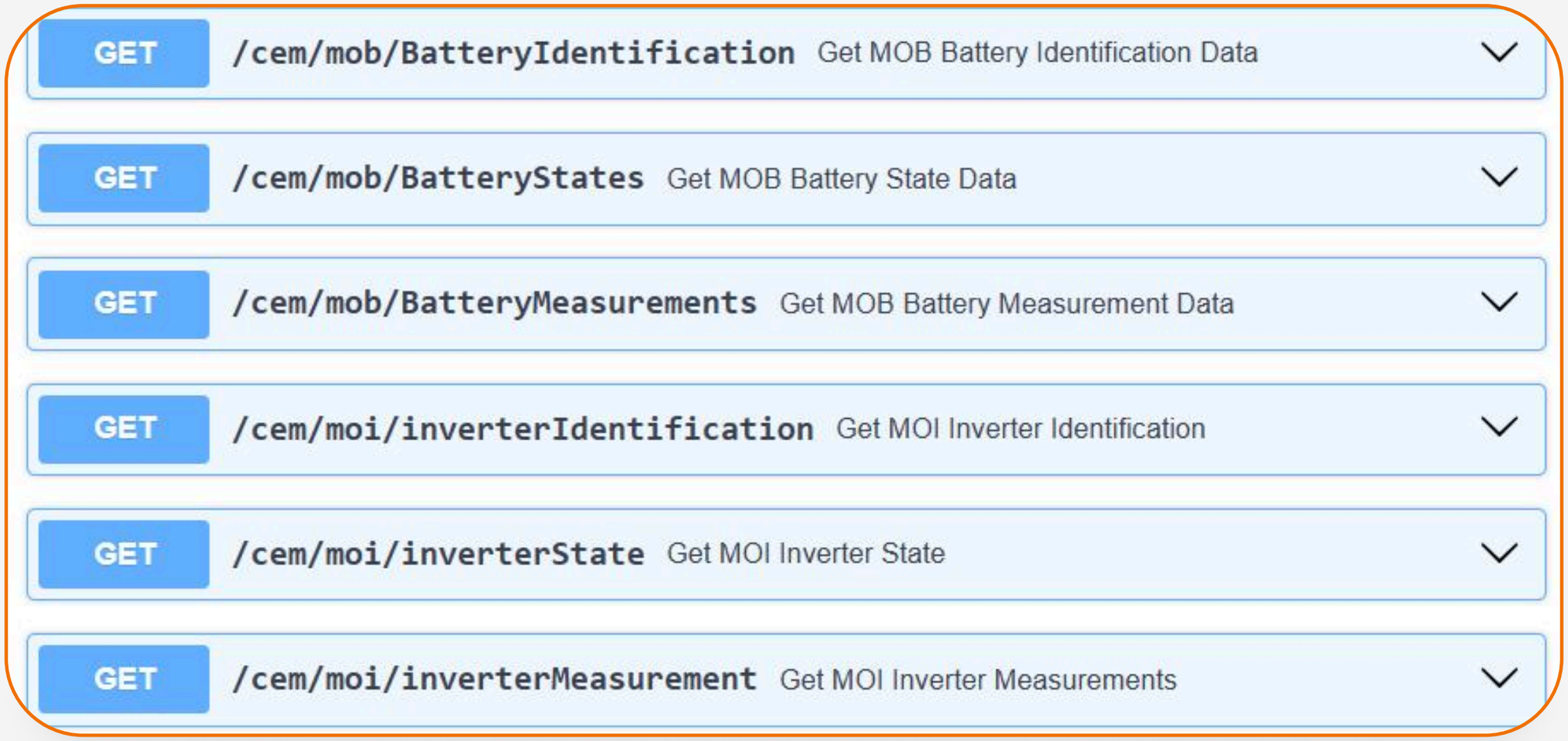


Window presenting the whole **MOB data** for the selected battery



Battery Data

Inverters Use case APIs



3. Enhanced Analysis & Debugging for LPC, LPP and MPC

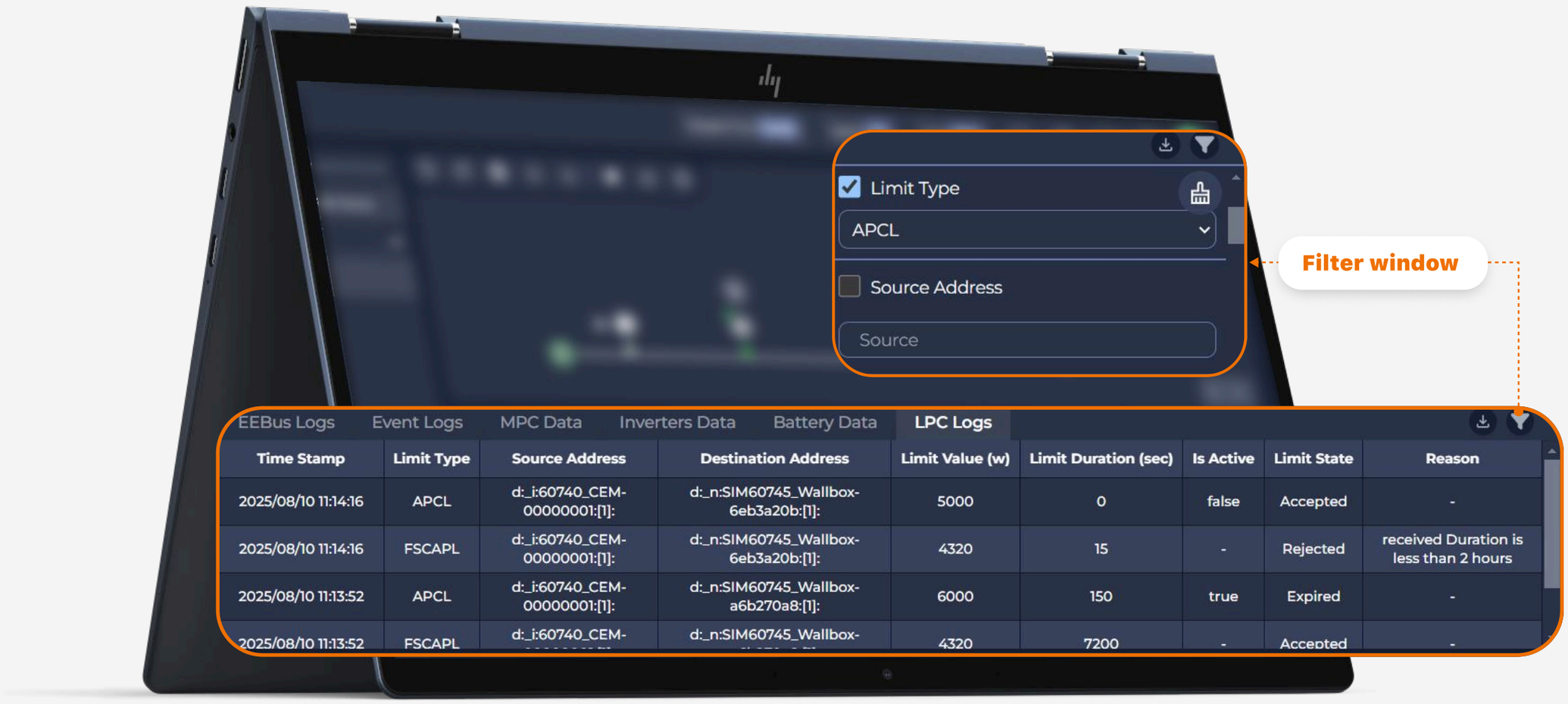
New views for LPC, LPP, MPC – full command tracking.

Comprehensive status visibility.

Error logging with clear failure reasons.

Empowers testers, developers, and CI/CD workflows.

3. Enhanced Analysis & Debugging for LPC, LPP and MPC



LPC/LPP logging is a feature that tracks and displays **LPC/LPP commands** exchanged between devices, showing when limits were applied, by whom, for how long, and whether they were accepted or rejected.

The **LPC/LPP Logs** table provides a detailed, timestamped view of all LPC/LPP events enforced via the EEBUS Hub. It logs critical parameters for tracking and diagnosing LPC/LPP operations as viewed in the table **in the next slide**

3. Enhanced Analysis & Debugging for LPC, LPP and MPC

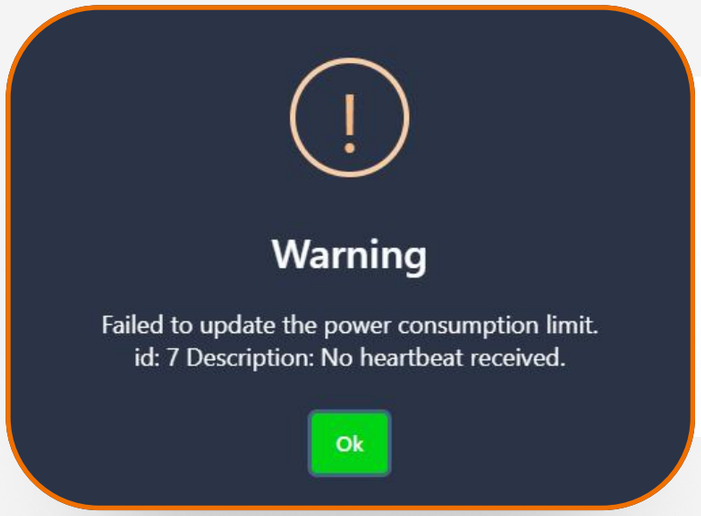
EEBus Logs | Event Logs | MPC Data | Inverters Data | Battery Data | **LPC Logs**

Time Stamp	Limit Type	Source Address	Destination Address	Limit Value (w)	Limit Duration (sec)	Is Active	Limit State	Reason
2025/08/10 11:14:16	APCL	d:_i:60740_CEM-00000001:[1]:	d:_n:SIM60745_Wallbox-6eb3a20b:[1]:	5000	0	false	Accepted	-
2025/08/10 11:14:16	FSCAPL	d:_i:60740_CEM-00000001:[1]:	d:_n:SIM60745_Wallbox-6eb3a20b:[1]:	4320	15	-	Rejected	received Duration is less than 2 hours
2025/08/10 11:13:52	APCL	d:_i:60740_CEM-00000001:[1]:	d:_n:SIM60745_Wallbox-a6b270a8:[1]:	6000	150	true	Expired	-
2025/08/10 11:13:52	FSCAPL	d:_i:60740_CEM-	d:_n:SIM60745_Wallbox-	4320	7200	-	Accepted	-

Column	Description
Time Stamp	The exact date and time the LPC/LPP command was received or applied.
Limit Type	Type of the power limitation command (e.g.,APCL*1, FSCAPL*2,APPL*3,FSPAPL*4).
Source Address	Device that issued the limitation command.
Destination Address	Target device that must apply the limitation.
Limit Value (W)	The maximum allowed power in watts.
Limit Duration (sec)	Duration for which the limit should remain active.
Is Active	Boolean showing if the limit is to be activated or not (e.g., true or false).
Limit State	Result of the limit command (e.g., Accepted, Rejected, Expired).
Reason	Explanation for rejections or exceptional states (e.g., "received Duration is less than 2 hours").

*1 : Active Power Consumption Limit
*2: Failsafe Consumption Active Power Limit
*3: Active Power Production Limit
*4: Failsafe Production Active Power Limit

3. Enhanced Analysis & Debugging for LPC, LPP and MPC

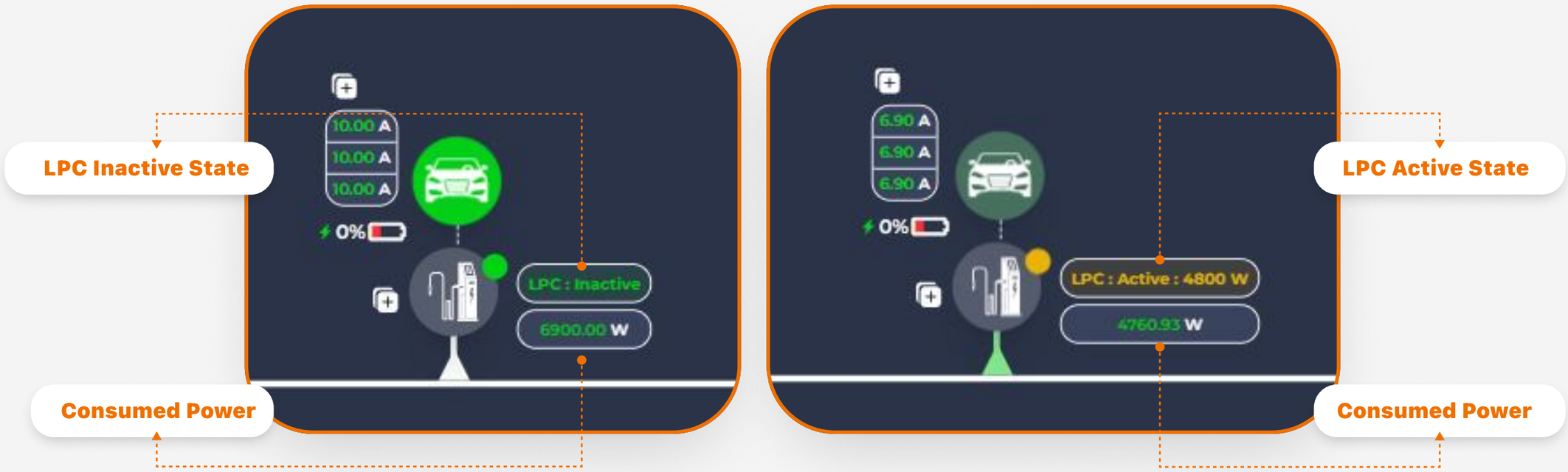


LPC/LPP Rejection

Commands are now **tracked and reported** in the UI.

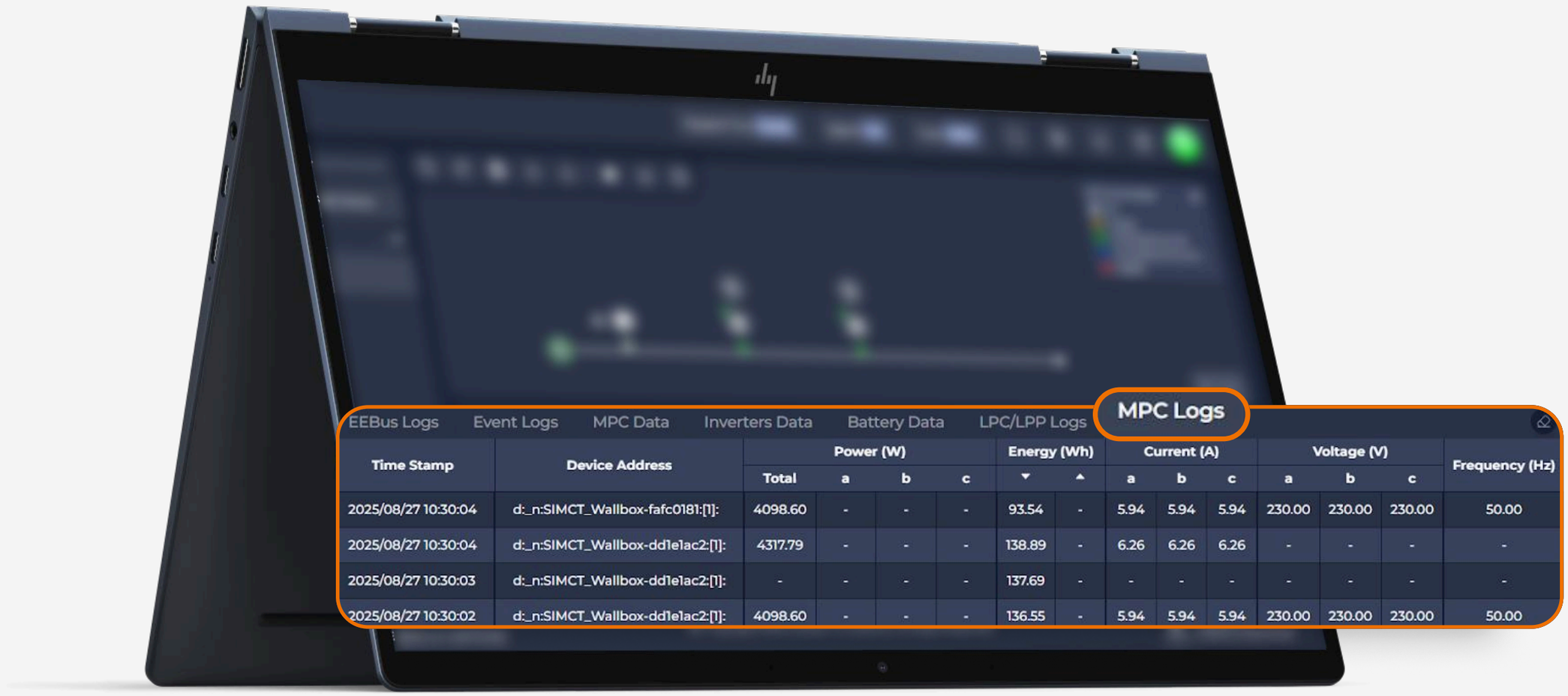
LPC/LPP State Tracking

LPC/LPP Limit info



LPC/LPP State is **shown** beside every controllable device.

3. Enhanced Analysis & Debugging for LPC, LPP and MPC



MPC Logs : A buffer containing the full list of **MPC Information** exchanged over the EEBUS network, with an additional feature to export the data to a file

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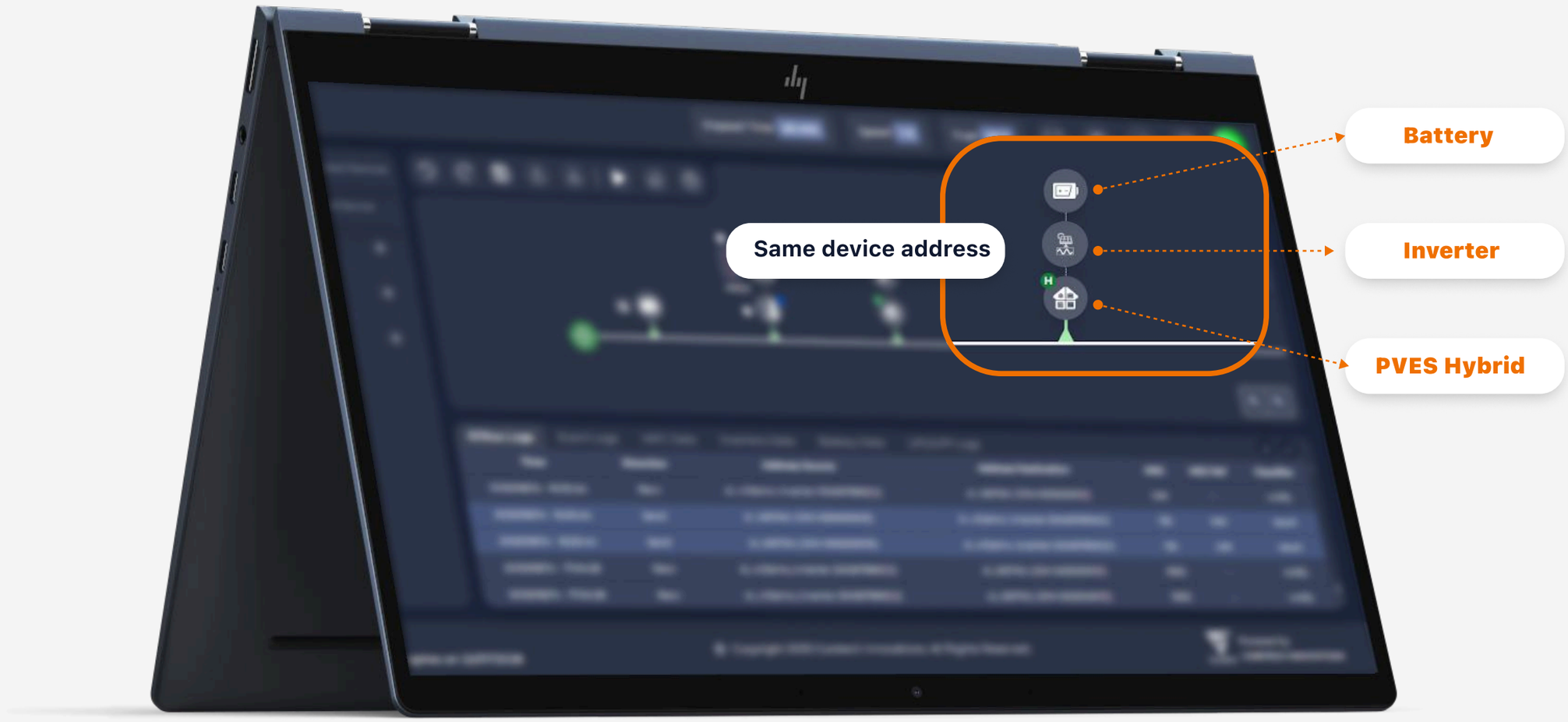
4. EEBUS Devices Hierarchy View



Now if a device **has one or child entities**,
the **UI** shows such constellations

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4. EEBUS Devices Hierarchy View


```
[{"description":[{"entityAddress":[{"entity":[1]}]},{"entityType":"PVESHybrid"}]}],
[{"description":[{"entityAddress":[{"entity":[1,1]}]},{"entityType":"Inverter"}]}],
[{"description":[{"entityAddress":[{"entity":[1,1,1]}]},{"entityType":"Battery"}]}]
]
```


SPINE Entity Information

This Spine Entity Information will be translated in the UI to the following

EEBUS-Hub **complex** setup

EEBUS Devices Hierarchy View (Cond.)

This example shows the ability to view complex hierarchies showing the entities and their children.

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Supported EEBUS Use Cases

E-Mobility

- Overload Protection by EV Charging Current Curtailment
- EVSE Commissioning and Configuration
- EV State of Charge
- EV Charging Electricity Measurement
- EV Comissioning and Configuration
- Optimization of Self Consumption during EV Charging

Grid

- Limitation of Power Consumption
- Monitoring of Power Consumption
- Limitation of Power Production
- Monitoring of Grid Connection Point

Inverter

- Monitoring of Inverter
- Monitor of Battery
- Control of Battery

HVAC

- Optimization of Self Consumption by Heat Pump Flexibility
- Incentive Table based Power Consumption Management

Fully Supported Partially Supported Implementation In Progress

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Supported Devices

EEBUS Hub supports the following devices:

- EV& EVSE
- Inverter
- CEM/ HEMS
- Home Fuse Limits
- Control Box
- Uncontrollable Device

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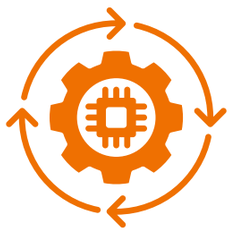
How can we help you with your EEBUS product ?

EEBUS Stack integration support

CICD Pipelines Setup

EEBUS Compliance Testing



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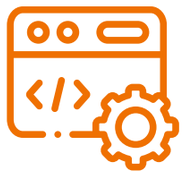

Software/System Validation

Real Time Embedded Systems

Web/Mobile Apps

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