Document Information

Subject	Technical Notes for PS5120E/ES Battery Configuration
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Location	Mönchengladbach Office, DE
Applied Model	MES PS5120E Battery (Rack installation) MES PS5120ES Battery (Stackable installation)

Terms and Abbreviations

BMS	Battery Management System
DIP	Dual In-line Package
ESS	Energy Storage System
SoC	State of Charge

Description and Statement

Firmware Compatibility and Installation Order for MES PS5120E/ES Energy Storage Systems

To ensure optimal performance and compatibility within ESS, it is imperative to adhere to the following guidelines regarding firmware versions and installation order.

Firmware Consistency:

- **Identical Firmware:** All batteries installed in the same system, including new batteries added in an existing system, must have the same BMS firmware version.
- **Firmware Discrepancy:** If firmware versions cannot be updated, batteries must be installed in descending order of firmware age. The battery with the latest firmware should be designated as the primary battery (host), which connects the BMS communication to the inverter.

Battery Type and Installation Order:

- **Maximum Battery Quantity:** One ESS can be configured up to 30 batteries, with both PS5120E and PS5120ES, also both batteries with 4DIP switch and 5DIP switch. Each battery requires to have unique address setting on its DIP switch. Please refer to user manual for instruction of DIP switch setting.
- **Batteries with 4DIP and 5DIP Switches:** When configuring the address of each battery, both 4DIP and 5DIP model can be configured to the address from 1 to 15. When the system is planned to install more than 15 batteries, 5DIP model must be used for addresses from 16 to 30.
- **Firmware Update:** In the case new 5DIP batteries are added into an existing 4DIP batteries system, the 4DIP batteries must be updated to a BMS firmware version as the same as firmware version of the new 5DIP batteries or the later version.

Non-Compliance Implications:

Failure to comply with these guidelines may result in:

- **System Instability:** Potential issues with system stability, communication, and overall performance.
- **Reduced Efficiency:** Diminished energy storage capacity and efficiency.
- **Safety Risks:** In extreme cases, potential safety hazards.

Recommendation:

To avoid complications and ensure seamless integration of new batteries into an existing ESS, it is strongly recommended to:

1. **Verify Firmware Versions:** Confirm the firmware versions of all existing and new batteries before installation.
2. **Plan Installation Order:** Determine the optimal installation order based on firmware versions and battery types.
3. **Update Firmware:** Update the firmware of existing batteries as necessary to match or exceed the firmware of the newest batteries.
4. **Consult Manufacturer's Guidelines:** Refer to the specific manufacturer's guidelines for detailed instructions and recommendations.

SoC Difference Limit

To maintain optimal system health, the difference in SoC between any two connected batteries should not exceed 20%.

Recommended Practices:

- **Pre-Charge Balancing:** Before connecting batteries, it is advisable to pre-charge or discharge them to achieve a similar SoC level.

Possible Result by Failure to adhere to SoC matching guidelines:

- **Reduced Battery Life:** Accelerated degradation of battery cells due to uneven stress.
- **Performance Degradation:** Diminished energy storage capacity and power output.
- **Safety Risks:** Potential for thermal runaway or other safety hazards in extreme cases.

By strictly adhering to these guidelines, you can maximize the efficiency, reliability, and safety of your Energy Storage System.