PARALLELING 314AH TO 280AH BATTERIES

APP NOTE

OVERVIEW:

This document outlines key considerations and commissioning guidelines when paralleling 314Ah batteries with 280Ah batteries.

KEY CONSIDERATIONS:

- **Compliance:** When retrofitting or adding 314Ah batteries to a 280Ah battery bank, the ESS will no longer be a UL 9540 listed configuration. Please communicate with the local AHJ (Authority Having Jurisdiction) before purchasing EG4® 314Ah batteries for incorporation to an existing 280Ah battery bank.
- **Auto-ID:** The 314Ah batteries do not have DIP switches and must be the master battery in the bank. This is important for retrofit scenarios as the 314Ah battery must be the one communicating with the inverter.
- **Bank Imbalances:** State of Charge (SOC) values during charge/discharge cycles may differ between the 280Ah and 314Ah batteries. This is due to the batteries having different storage capacities.
- **Communication Cable:** When configuring closed-loop communication between 314Ah and 280Ah batteries, a custom cable must be used to ensure proper communication.
- **Retro Fitting:** When adding 314Ah batteries to existing 280Ah battery banks, the 314Ah battery may be depleted faster than the 280Ah batteries. It is important to note this as it could further bank imbalances. It is necessary to charge all batteries 100% SOC before paralleling batteries together.
- **Closed-Loop Paralleling Limit:** A maximum of eight 314Ah batteries can be paralleled together when communicating to other 280Ah batteries.

COMMUNICATION:

1. **Communication Cable:** The battery-to-battery cable requires RJ45 connectors to be wired only to pins 7 & 8 on both ends. Pins 1 through 6 must not be wired to the RJ45 connectors.
    a. This cable must be used between the 280Ah to 314Ah battery, and all 280Ah batteries must use this cable in the bank.
    b. 314Ah battery-to-battery cables can use a standard CAT 5 or CAT 6 cable.

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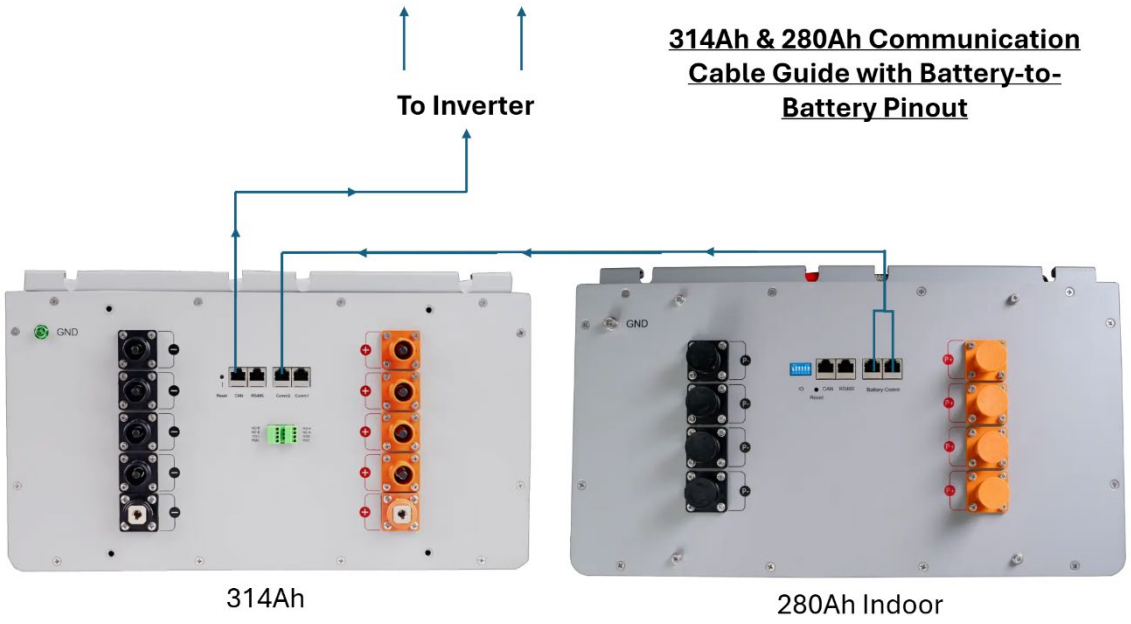
2. **Connections:** The 280Ah battery can use either of its “Battery-Comms” ports for communication with the 314Ah battery. However, for the 314Ah battery, the communication cable must be connected to “Comm2.”



The photo above shows “Comm2” being used on the 314Ah, and either of the “Battery-Comms” being used on the 280Ah. Do not wire to both “Battery-Comms” ports, only one is required for the 314Ah battery, the other is used for daisy chaining to the next battery.

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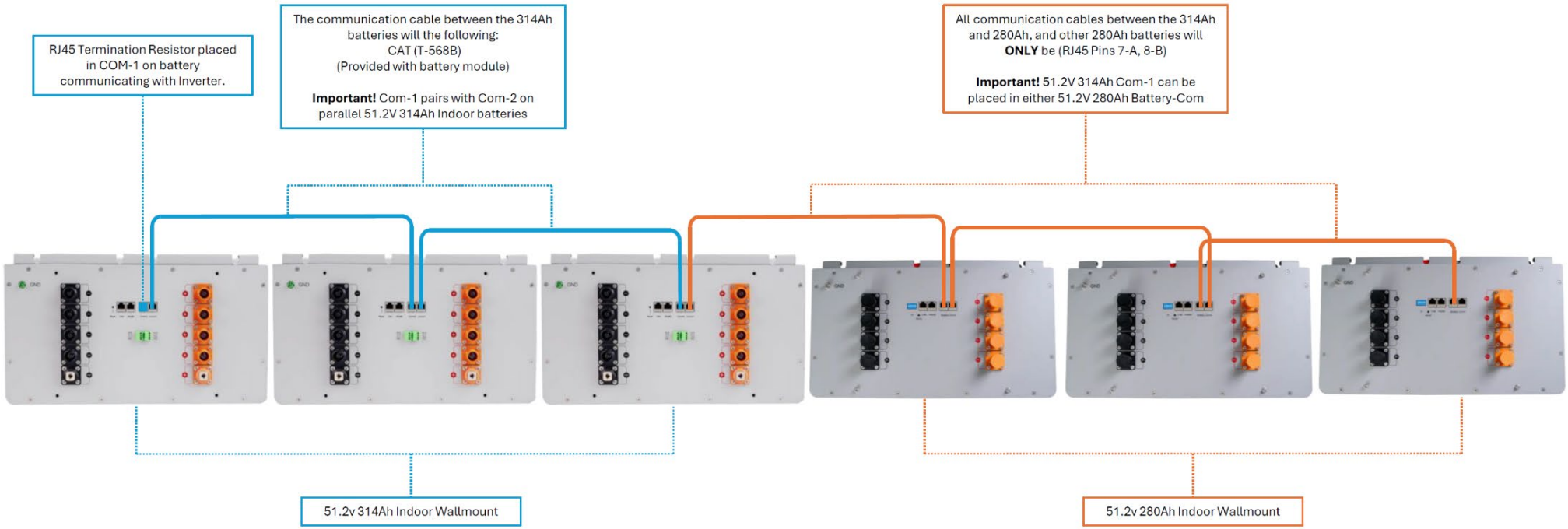
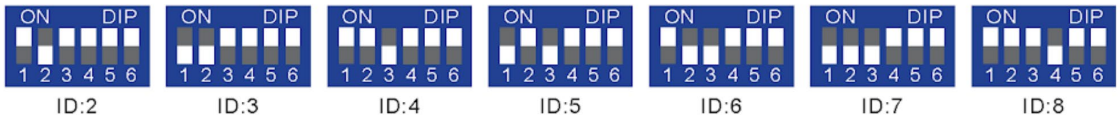
51.2V 314Ah Indoor and 51.2V 280Ah Indoor Parallel Communication Wiring Diagram



The photo above shows the proper connections for communication between multiple 314Ah and 280Ah batteries.

3. **280Ah DIP Switch IDs:** The 280Ah DIP Switch IDs must be set to the numerical value after the last 314Ah battery in the bank. (E.g. 3x 314Ah, the 280Ah batteries would be set to 4, 5, 6…)



4. **Auto-ID Termination:** When paralleling a 314Ah battery, a 120 Ohm terminator must be used to close the loop. The terminator is connected to the first/master 314Ah battery in the stack in the "Comm1" port.
5. **Turn On Sequence:** Power on the master 314Ah battery first, then turn on each remaining 314Ah battery in order in ~5 second intervals. Once all 314Ah batteries are on, switch on the 280Ah batteries corresponding to their DIP switch number.

PARALLELING 314AH TO 280AH (CONNECTIONS & SOC):

Power Cable Connections: When connecting power cables between batteries and the inverter, the standard practice outlined in the manual must be followed. There is no special requirement to connect power cables between 280Ah and 314Ah batteries.

SOC Variations: The battery bank may experience up to 5% SOC variation between 280Ah and 314Ah batteries. To limit SOC variation, please ensure all batteries are charged to 100% SOC before paralleling.

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