Technical Information

SUNNY BOY SMART ENERGY

Approved batteries and information on connecting batteries

1 Validity

This document is valid for:

- SBSE3.6-50 (Sunny Boy Smart Energy 3.6)
- SBSE4.0-50 (Sunny Boy Smart Energy 4.0)
- SBSE5.0-50 (Sunny Boy Smart Energy 5.0)
- SBSE6.0-50 (Sunny Boy Smart Energy 6.0)
- SBSE8.0-50 (Sunny Boy Smart Energy 8.0) / **Grid approval only available for Italy**
- SBSE9.9-50 (Sunny Boy Smart Energy 9.9) / **Grid approval only available for Italy**

2 Approved Batteries

You can find the batteries approved by SMA Solar Technology AG in the SMA Home Energy Solution with the Sunny Boy Smart Energy in the following table.

Firmware version of the battery

The firmware version of the SMA Home Storage can be accessed and updated via the inverter user interface. The firmware version of third-party batteries can be updated via the respective battery's user interface (see the manufacturer's manual).

Inverter firmware version

The firmware version of the inverter can be accessed via the user interface of the inverter.

Battery name (type) Manufacturer	Firmware Version of the Battery	Firmware Version of the Inverter
SMA Home Storage (3.2-16.4) SMA Solar Technology AG	BMS: ≥1.01.19.R	≥ 3.08.03.R
Battery-Box Premium HVM (8.3-22.1) BYD Company Limited	BMU: ≥ 3.23 BMS: ≥ 3.28	≥ 3.08.03.R
Battery-Box Premium HVS (5.1-10.2) BYD Company Limited	BMU: ≥ 3.23 BMS: ≥ 3.28	≥ 3.08.03.R
Pylontech Force H3 Pylon Technologies Co., Ltd.	BMS: ≥ 1.6	≥ 3.12.15.R

Parallel operation is not possible

The listed batteries are **not** approved for **parallel operation** of multiple battery units in conjunction with the Sunny Boy Smart Energy.

3 Usable power

3.1 General information on usable power

Synchronizing the battery and hybrid inverter

All batteries mentioned supply a defined nominal current. Please follow the battery manufacturer's recommendations regarding appropriate battery dimensioning in order to achieve the nominal and overload currents of the systems with a Sunny Boy Smart Energy, as specified in the datasheet. Only if the dimensioning of the battery size is synchronized (battery capacity, battery currents, number of battery modules if necessary), the full functionality and power incl. overload can be guaranteed for the PV storage system with the respective hybrid inverter in use.

3.2 Usable Power with SMA Home Storage

	SMA Home Storage 3.2	SMA Home Storage 6.5	SMA Home Storage 9.8	SMA Home Storage 13.1	SMA Home Storage 16.4
Voltage range of battery	90 V to 108 V	180 V to 216 V	270 V to 324 V	360 V to 432 V	450 V to 540 V
Maximum current	30 A	30 A	30 A	30 A	30 A
Maximum power	2.7 kW to 3.2 kW	5.4 kW to 6.5 kW	8.1 kW to 9.7 kW	10.6 kW	10.6 kW

3.3 Usable Power with the Battery-Box Premium HVM

	HVM 8.3	HVM 11.0	HVM 13.8	HVM 16.6	HVM 19.3	HVM 22.1
Voltage range of battery	120 V to 177 V	160 V to 236 V	200 V to 295 V	240 V to 354 V	280 V to 413 V	320 V to 472 V
Maximum current	30 A	30 A	30 A	30 A	30 A	30 A
Maximum power	3.6 kW to 5.31 kW	4.8 kW to 7.08 kW	6 kW to 8.85 kW	7.2 kW to 10.6 kW	8.4 kW to 10.6 kW	9.6 kW to 10.6 kW

3.4 Usable Power with the Battery-Box Premium HVS

	HVS 5.1	HVS 7.7	HVS 10.2
Voltage range of battery	160 V to 240 V	240 V to 360 V	320 V to 480 V
Maximum current	14.6 A to 25 A	25 A	25 A
Maximum power	2.4 kW to 6 kW	6 kW to 9 kW	8 kW to 10.6 kW

3.5 Usable Power with the Pylontech Force H3

Module	2	3	4
Voltage range of battery	185 V to 230 V	278 V to 345 V	371 V to 480 V
Maximum current	30 A	30 A	30 A
Maximum power	3.5 kW to 6 kW	3.5 kW to 9 kW	3.5 kW to 9.9 kW

4 Battery Communication Connection

4.1 Requirements for the Battery Communication and Power Cables

Battery Communication Cable Requirements

The cable length and quality affect the quality of the signal. Observe the following cable requirements:

- ☐ Cable type: 100BaseTx
- ☐ Cable category: minimum CAT5e
- ☐ Shielding: SF/UTP, S/UTP, SF/FTP or S/FTP
- ☐ Maximum cable length within the inverter: 260 mm
- ☐ Number of insulated conductor pairs and insulated conductor cross-section: at least 2 x 2 x 0.34 mm²
- ☐ Maximum cable length between inverter and battery when using patch and installation cables: 10 m
- ☐ UV-resistant for outdoor installation.

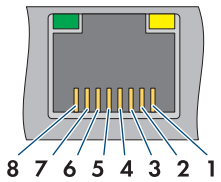
Requirements for Battery Power Cables

Observe manufacturer's specifications for battery power cables

When crimping battery power cables, the appropriate tool, correct cable cross-section, proper insulation stripping length, and a firm but non-damaging crimp are essential for a safe and conductive connection. Make sure not to damage the stranded wires and to insert and tighten all components correctly, especially the strain relief, to ensure a durable, moisture-proof, and abrasion-resistant connection.

4.2 Cabling plan with SMA Home Storage

4.2.1 Pin assignment of RJ45 plug connector for battery communication via CAN bus

RJ45 plug	Pin	Signal
	1	-
	2	EN_GND
	3	RS485 D+
	4	CAN_H
	5	CAN_L
	6	RS485 D-
	7	Reserved
	8	-

4.2.2 Cabling plan with SMA Home Storage

To connect the Sunny Boy Smart Energy to the SMA Home Storage, you must use an RJ45 adapter for the plug connection. The adapter is included in the scope of delivery of the battery. Make sure that the RJ45 termination plug is plugged in on the bottom battery data cable of the last battery module.

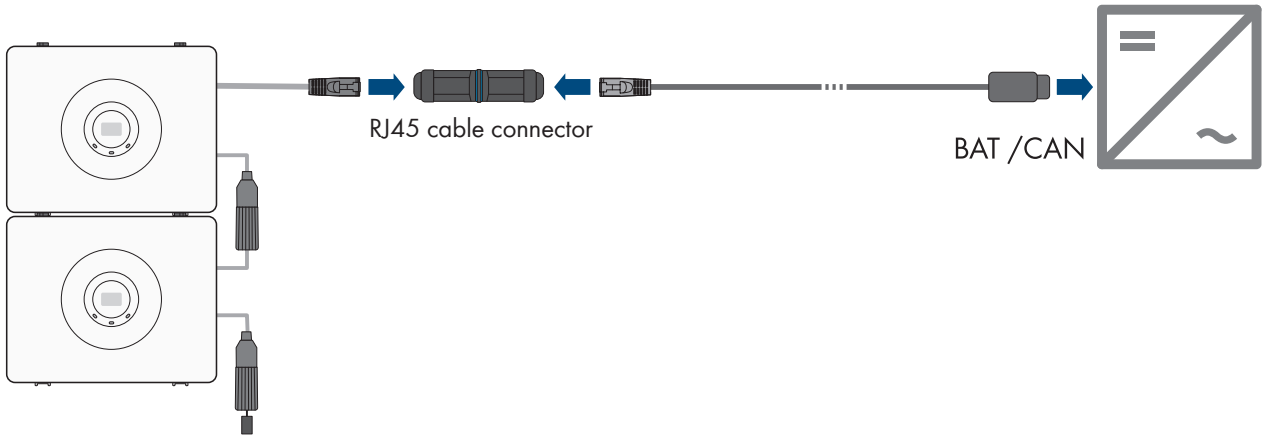


Figure 1: Cabling plan of Sunny Boy Smart Energy with SMA Home Storage

Also see:

- Requirements for the Battery Communication and Power Cables ⇒ page 5

4.3 Cabling Plan with Battery-Box Premium HVS/HVM and BCU 1.0

The bridge at the GSI terminal must be inserted during operation.

Upon delivery of the Sunny Boy Smart Energy, there is a jumper wire on the **GSI** terminal block. This jumper wire must be removed when a switch for the fast stop is connected. Once the jumper wire has been removed and no switch is connected, operation with a battery is no longer possible.

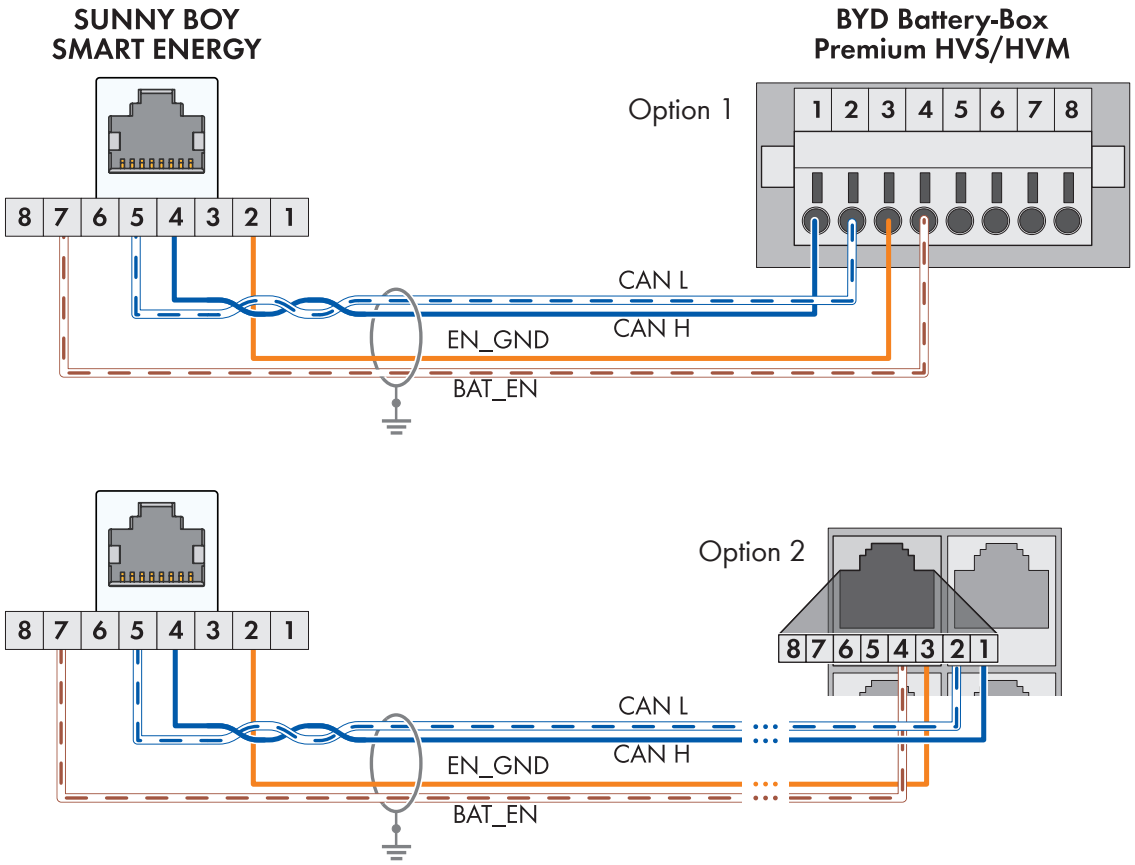


Figure 2: Cabling plan Sunny Boy Smart Energy with Battery-Box Premium HVS/HVM and BCU 1.0

Pin at the RJ45 connector on the inverter	Signal	Terminal point or RJ45 connector on the battery
1	-	-
2	EN_GND	3
3	-	-
4	CAN_H	1
5	CAN_L	2
6	-	-
7	BAT_EN	4
8	-	-

4.4 Cabling Plan with Battery-Box Premium HVS/HVM and BCU 2.0

The bridge at the GSI terminal must be inserted during operation.

Upon delivery of the Sunny Boy Smart Energy, there is a jumper wire on the **GSI** terminal block. This jumper wire must be removed when a switch for the fast stop is connected. Once the jumper wire has been removed and no switch is connected, operation with a battery is no longer possible.

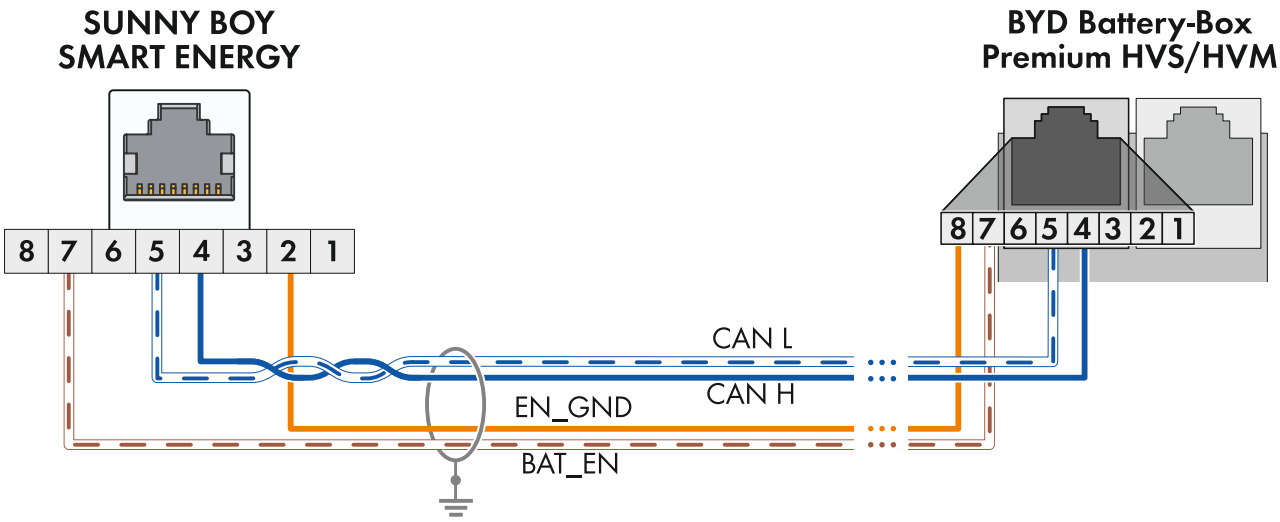


Figure 3: Cabling plan Sunny Boy Smart Energy with Battery-Box Premium HVS/HVM and BCU 2.0

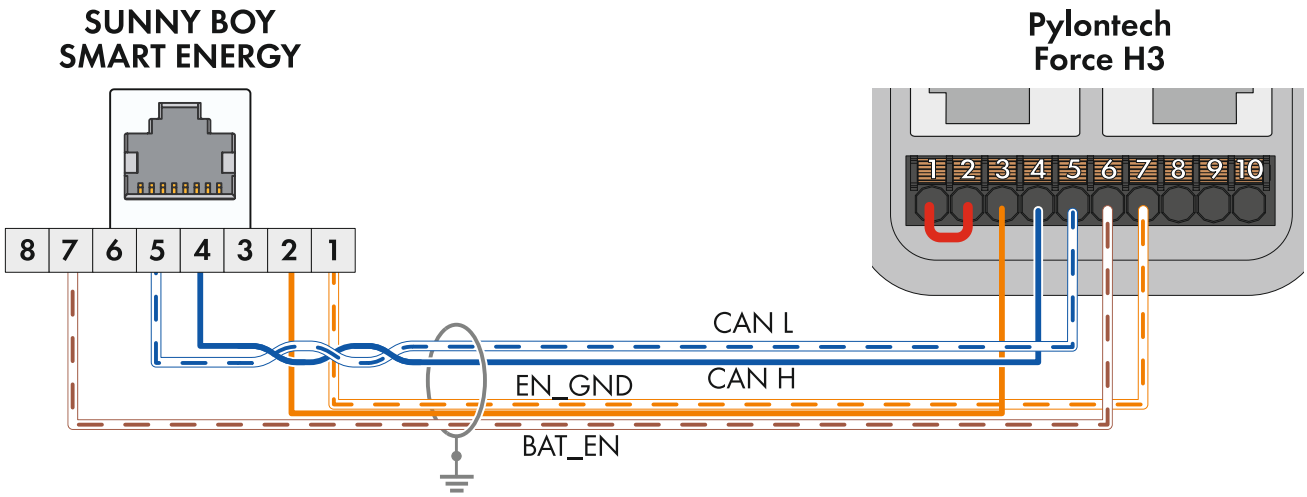
Pin at the RJ45 connector on the inverter	Signal	RJ45 connector on the battery
1	-	-
2	EN_GND	8
3	-	-
4	CAN_H	4
5	CAN_L	5
6	-	-
7	BAT_EN	7
8	-	-

4.5 Cabling plan with Pylontech Force H3

The bridge at the GSI terminal must be inserted during operation.

Upon delivery of the Sunny Boy Smart Energy, there is a jumper wire on the **GSI** terminal block. This jumper wire must be removed when a switch for the fast stop is connected. Once the jumper wire has been removed and no switch is connected, operation with a battery is no longer possible.

Pins 1 and 2 at the battery terminal point must be bridged.



Pin at the RJ45 connector on the inverter	Signal	Terminal point at battery
1	EN_GND	7
2	EN_GND	3
3	-	-
4	CAN_H	4
5	CAN_L	5
6	-	-
7	BAT_EN	6
8	-	-

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