ELERIX Storage EX-S5

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PRODUCT WEBPAGE ›

EX-S5

ELERIX STORAGE EX-S5

Product description

The energy storage is based on LiFePO4 batteries with a built-in Battery Management System (BMS) and short circuits protection. The power output of the storage is 48V 100A (5kW), communication output CAN and RS485 serve for further management, communication, and monitoring with other devices. The outputs are on both sides of the box. Robust and easy to service design.

The individual 5kW modules can be scaled with system power and communication connections up to 12 units (master + 11 slaves). This increases the storage capacity up to 60kWh, but the resulting output power and voltage remain the same - 5kW /48V at the level of master output. The parallel interconnection of masters is not supported by the software.

The product is primarily intended to be used as stationary storage, i.e. for floor-mounted storage in a building.

The product package includes:

- 1 pc battery box
- 1 pc set for anchoring to the wall (brackets, dowels, screws)
- 1 pc power cable for connecting to the downstream installation (one end system connector for connection to the box, the other end to 8mm lugs, the length of the cable is 2m)
- 1 pc connecting power cable between boxes (system connectors on both sides, length 0.5m)
- 1 pc link communication cable between boxes (LinkPort, length 0.5m)
- 1 pc grounding wire (length 0.5m, M5 lugs)

For communication with the Victron system, it is necessary to purchase an optional accessory - Victron GX CAN cable.

Possibilities of use

- Photovoltaic power plants in parallel operation with the distribution grid (family houses, small industrial installations...)
- Island (off-grid) photovoltaic installations (cottages, mobile houses...)
- Backup power sources (external batteries for UPS modules...)

The condition of use is integration with chargers (MPPT, LAN network...) and appliances (most often inverters) that support the mode for LiFePO4 batteries in the 48V voltage level. Typical combinations are e.g. with Victron Energy products.

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Description of operation

The battery is capable of powering a load and/or being charged via either power output (the outputs are connected in parallel internally). Using an integrated BMS, these outputs are regulated by a power semiconductor element as follows:

‣ If the battery is fully charged, the electrical path for further charging is closed, but discharging is allowed. Charging is enabled as soon as the battery is discharged (change of current flow in the power output).

‣ If the battery is completely discharged, the path to further discharge is closed, but charging is enabled. Discharging is enabled as soon as the battery is charged (change in current flow in the power output).

The charging status is indicated on the LED indicator. The outputs are protected against a short circuit by a 200A solid-state fuse.

Via the CAN communication port, the battery can be connected to the VE Cerbo communication module and the following values can be read out in the VRM portal:

‣ Power drawn or supplied (the resulting difference between charging and discharging power)

‣ Current drawn or supplied (resulting difference in current flow)

‣ Total battery voltage

‣ Battery SoC

‣ Internal battery temperature

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Technical specification

| Parameter	Value	Note
Capacity	100Ah	When operating at 25°C
Nominal voltage	DC 51.2V	16 LiFePO4 cells in series (system voltage DC 48V)
Min. operating voltage	43.2V	When this value is reached, the battery will prevent further discharge. Resume discharging by changing the mode to charging.
Max. operating voltage	57.6V	When this value is reached, the battery will prevent charging. Resume charging by changing the mode to discharge.
Recommended operating voltage	48 – 57V	Approximately 90% capacity is used at optimum operating temperature.
Max. operating charging current	100A	Charging will shut down after the 30s if 105A is exceeded or after 1s if 125A is exceeded. Return to the operating state after the 60s.
Max. operating discharging current	100A	Discharging is shut down after 300s when 110A is exceeded or after the 30s when 125A is exceeded or after 1s when 155A is exceeded. Return to the operating state after the 60s.
Recommended discharging/charging current	80/50A	Increased lifetime (cycles)
Discharge operating temperature	-15°C to 55°C	Optimal 5°C to 40°C
Charging operating temperature	0°C to 55°C	Optimal 5°C to 40°C
Lifetime (cycles)	> 6000	Operating at 25°C and 90% DoD
Max. time without charging	3 months	Service recharging to compensate for BMS self-consumption and battery self-discharge.
Dimensions w/d/h	342/207/600 mm	
IP protection	IP 21	
Weight	49 kg	
Energy density	104Wh/kg	
Max number of modules in parallel communication	12	1x master with power and communication output and 11x slaves
Communication	RS 485/CAN	

Description of inputs, outputs, controls and indications

External communication | Communication to the next box | Power output 5kW
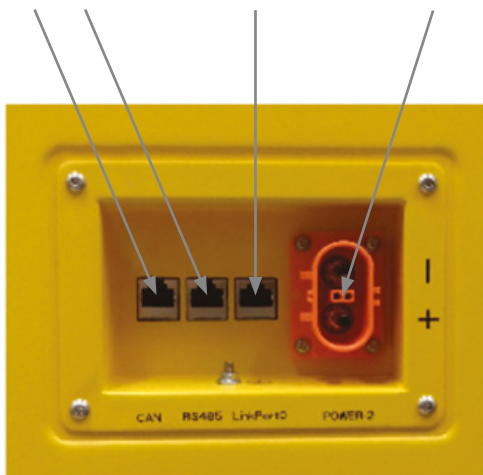
Power connection to the next box | Communication to the next box | Adjust switch
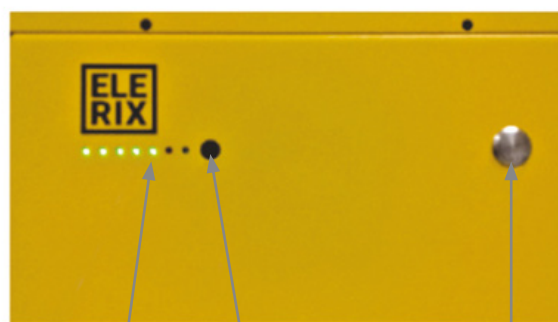
Led indication | Start button | Start / Stop power switch

Setup, commissioning, status indication

Set the appropriate configuration for the number of boxes used on the 12-pin ADJUST SWITCH - see Table 1. Press the START/STOP POWER SWITCH button for 1s (all LEDs will light up). Then press the START button for approx. 3s. After a delay of approx. 5s, the operating status LEDs are displayed - see Table 2. In this mode, power is available at the power output. A possible error condition is indicated according to Table 3. If the power output of the box is connected to DC 48V in a battery off state (e.g. to an inverter in hybrid operation), the BMS of the box indicates this and switches on the battery and connects the power output automatically. However, when connecting multiple parallel boxes, in this case, a manual start of the slave modules is required. To manually shut down the boxes, press the START/STOP POWER SWITCH button.

In the case of two or more parallel modules, connect the data communication between the modules using the accessory cable between LinkPort1 of the first (master) and LinkPort0 of the next (slave) module and use the same step between the slave modules. For communication with Victron devices via the VE GX Cerbo communication unit, a **communication cable can be purchased here**. Please refer to the product manuals of the respective Victron elements to revive the communication. See table 4 for the arrangement of the communication connectors.

Number of batteries	Master	Slave 1	Slave 2	Slave 3	Slave 4	Slave 5	Slave 6	Slave 7	Slave 8	Slave 9	Slave 10	Slave 11
1	0001 0000											
2	0010 0000	0000 0001										
3	0011 0000	0000 0001	0000 0010									
4	0100 0000	0000 0001	0000 0010	0000 0011								
5	0101 0000	0000 0001	0000 0010	0000 0011	0000 0100							
6	0110 0000	0000 0001	0000 0010	0000 0011	0000 0100	0000 0101						
7	0111 0000	0000 0001	0000 0010	0000 0011	0000 0100	0000 0101	0000 0110					
8	1000 0000	0000 0001	0000 0010	0000 0011	0000 0100	0000 0101	0000 0110	0000 0111				
9	1001 0000	0000 0001	0000 0010	0000 0011	0000 0100	0000 0101	0000 0110	0000 0111	0000 1000			
10	1010 0000	0000 0001	0000 0010	0000 0011	0000 0100	0000 0101	0000 0110	0000 0111	0000 1000	0000 1001		
11	1011 0000	0000 0001	0000 0010	0000 0011	0000 0100	0000 0101	0000 0110	0000 0111	0000 1000	0000 1001	0000 1010	
12	1100 0000	0000 0001	0000 0010	0000 0011	0000 0100	0000 0101	0000 0110	0000 0111	0000 1000	0000 1001	0000 1010	0000 1011

Table 1

SOC LED Indicator

Status		Charge	Discharge	Stanf by
=100%	●	On	On	Off
	●	On	On	Off
	●	On	On	Off
	●	On	On	Off
	●	On	On	Off
>100%>SOC>=80%	●	Flash	On	Off
	●	On	On	Off
	●	On	On	Off
	●	On	On	Off
	●	On	On	Off
80%>SOC>=60%	●	Off	Off	Off
		Flash	On	Off
		On	On	Off
		On	On	Off
		On	On	Off
60%>SOC>=40%		Off	Off	Off
		Off	Off	Off
		Flash	On	Off
		On	On	Off
		On	On	Off
40%>SOC>=20%		Off	Off	Off
		Off	Off	Off
		Off	Off	Off
		Flash	On	Off
		On	On	Off
20%>SOC>=0		Off	Off	Off
		Off	Off	Off
		Off	Off	Off
		Off	Off	Off
		Flash	On	Off

Table 2

LED1   LED2   LED3   LED4   LED5   Alarm   Run
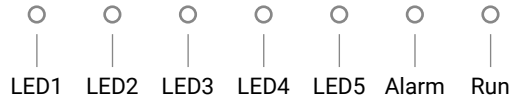
● Off
○ On
◐ Flash

Fault List	LED1	LED2	LED3	LED4	LED5	Alarm	Run
Adc/afe Fault	◐	●	●	●	●	○	○
Hight Voltage Fault	●	◐	●	●	●	○	○
Low Voltage Fault	◐	◐	●	●	●	○	○
Hight Temperature	●	●	◐	●	●	○	○
Low Temperature	◐	●	◐	●	●	○	○
Over current	●	◐	◐	●	●	○	○
Over Voltage/ Temperature	◐	◐	◐	●	●	○	○
Leakage Fault	●	●	●	◐	●	○	○
Inverter Comm Fault	◐	●	●	◐	●	○	○
Parallel Comm Fault	●	◐	●	◐	◐	○	○
Precharge Fault	◐	◐	●	◐	◐	○	○
Discharge/ Recharge/ Prohibit Charging low voltage	●	●	◐	◐	◐	○	○

Table 3

- Link Port0

Pin	Function definitions	Function declaration
1	B	RS485-B
2	A	RS485-A
3	GND	GND
4	NC	NC
5	NC	NC
6	GND	GND
7	A	RS485-A
8	B	RS485-B

- Link Port1

Pin	Function definitions	Function declaration
1	B	RS485-B
2	A	RS485-A
3	GND	GND
4	NC	NC
5	NC	NC
6	GND	GND
7	A	RS485-A
8	B	RS485-B

- RS485

Pin	Function definitions	Function declaration
1	B	RS485-B
2	A	RS485-A
3	GND	GND
4	NC	NC
5	NC	NC
6	GND	GND
7	A	RS485-A
8	B	RS485-B

- CAN

| Pin	Function definitions	Function declaration
1	NC	NC
2	GND	GND
3	NC	NC
4	CANH	CANH
5	CANL	CANL
6	NC	NC
7	NC	NC
8	NC	NC

Table 4

Installation, operation

‣ Only a suitably qualified person can install and connect the battery to the system.

‣ Install the battery by the regulations and standards for the country and environment and by its IP21 protection.

‣ Stabilize the battery box using the mounting bracket and observe the spacing as shown in Figure 1.

‣ Connect the power and data cables and commission the battery according to the instructions above.

‣ Arrange the operating temperature.

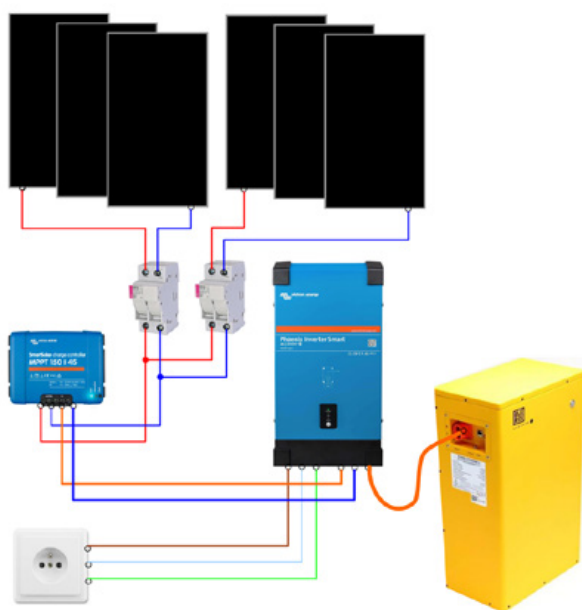‣ When storing or shutting down the module for longer period, secure that the battery is charged every 3 months.
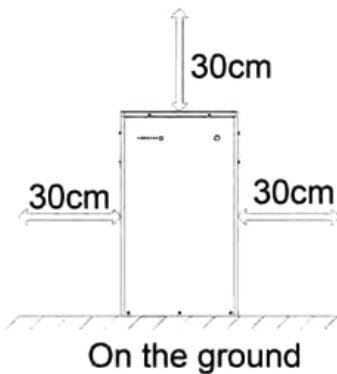
Position	Min size
Left	30 cm
Right	30 cm
Top	30 cm
Bottom	On the ground

Figure 1

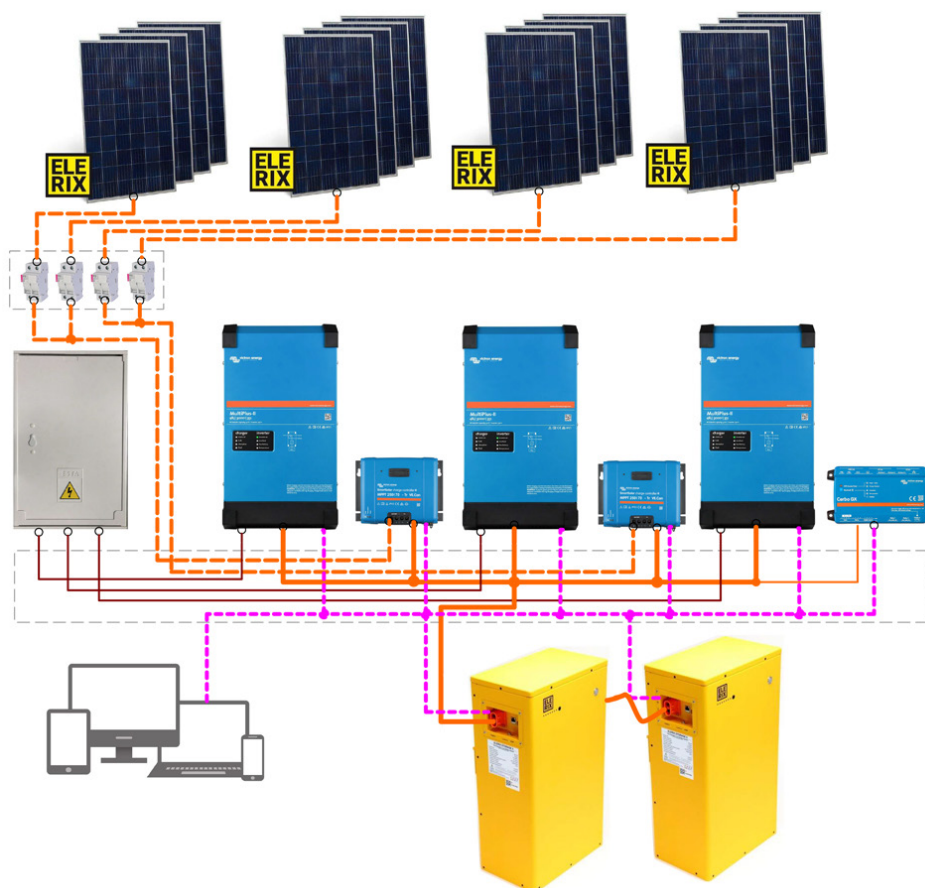## Examples of solutions with Victron components:

Single-phase island PV plant

Single-phase hybrid PV plant

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Three-phase hybrid PV plant with communication

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