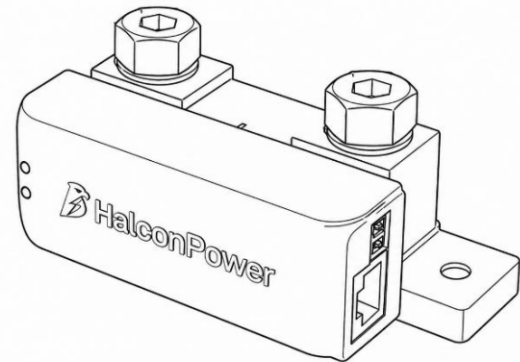




HALSH48500 User Manual

48V 500A Intelligent Shunt



Dear Customer:

Thank you for your purchase of Halcon Power Intelligent Shunt!

SAFETY INSTRUCTIONS

- **Use proper personal protective equipment (PPE)** when installing batteries.
Always wear safety goggles when working with flooded lead-acid batteries. If battery acid comes into contact with skin or eyes, rinse immediately with clean water and seek medical attention if necessary.
- **Prevent short circuits.**
Keep metal objects and tools away from battery terminals at all times.
- **Ensure adequate ventilation.**
Batteries may release explosive or corrosive gases during charging. Install and operate the system in a well-ventilated area.
- **Keep away from sparks and flames.**
Do not smoke or create sparks near batteries, as they may emit flammable gases.
- **Follow battery manufacturer guidelines.**
Always comply with the safety instructions provided by the battery manufacturer.
- **Protect from environmental exposure.**
For outdoor installations, shield the unit from direct sunlight, rain, and water ingress.
- **Ensure secure and reliable connections.**
Loose or corroded connections can generate excessive heat, which may damage insulation or cause fire. Tighten all connections securely and use cable ties or clamps to prevent movement and vibration.
- **Be aware of high voltage risks.**
System voltages may exceed safe levels. Use insulated tools, keep hands dry, and follow proper electrical safety practices.
- **Use correctly sized cables.**
Select wiring based on a current density of **no more than 5 A/mm²** to ensure safe and efficient operation.
- **Observe correct battery polarity.**
Never reverse battery connections. Incorrect polarity can cause permanent damage to the equipment and create serious safety hazards.

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1. Product Introduction

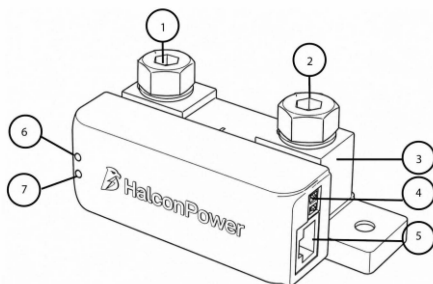
1.1 Overview

The HALSH Series is an intelligent battery shunt with built-in Bluetooth, allowing you to monitor battery data through a mobile app. It displays key information such as state of charge (SOC), remaining runtime, and historical data. The HALSH48500 supports 12V, 24V, and 48V systems and is compatible with sealed, gel, flooded, and lithium batteries. It accurately measures charge and discharge current, monitors battery status, and can track starting battery voltage. The unit is a high-precision coulomb counter with low power consumption, reliable performance, and easy installation.

1.2 Features

- Works with sealed lead-acid, gel batteries, open batteries, and lithium battery power measurement.
- Supports the following battery voltages: 12V/24V/36V/48V.
- Using high-precision current sampling, capable of measuring charge and discharge current.
- Uses advance SOC algorithm to accurately measure battery power and calculate remaining battery life.
- Measures and calculations battery use cycles. Ability to set battery capacity based on the size of the battery measured.
- Supports RS485 communication with standard Modbus protocol and CAN communication
- Bluetooth communication with Smart Phone APP for viewing product operating status and battery monitoring parameters.
- Supports low SOC, low voltage, high voltage and overcurrent alarm settings.

1.3 Attributes and Interface

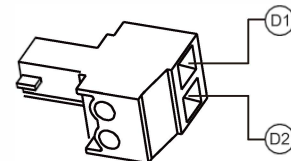


Attribute	Name
1	Load negative terminal (M10)
2	Battery negative terminal (M10)
3	Current separator
4	12V Power Input from Battery (Main & Starter)
5	RJ45 port
6	Bluetooth status indicator
7	Running status indicator light

Attribute 5 (RJ45 port) description:

S/N	Definition
●	CAN L
●	CAN
③	H NC
④	NC
⑤	Power ground/signal ground
⑥	D-
⑦	D+
⑧	NC

Attribute 4 Description:



D1: main battery
12V input positive
terminal, Red
16AWG cable

D2: starting battery
12V input positive
terminal, Gray
16AWG cable

2. Technical Parameters

Parameter name	Parameter value
Model Number:	HALSH48500
Static power	<=15mA
Battery Type	Sealed lead-acid, gel battery, open battery, lithium battery
Supply voltage	6.5~60V
Rated current	500A
System voltage	12/24/48V
Battery capacity	1~9999AH
Current resolution	±0.01A
Voltage resolution	±0.01V
SOC resolution	±0.1%
Time accuracy	±1Min
Current measurement accuracy	±0.4%
Voltage measurement accuracy	±0.3%
RS485 communication	9600bps, 8, 1, None, the default baud rate is 9600bps
Bluetooth communication	Built-in Bluetooth, supports APP data interaction and OTA upgrade
CAN communication	Support RV-C protocol
Historical data	Can store the last 60 days of historical data
Working environment temperature range	- 35~ • 65°C
Protection level	IP21
Cooling method	Natural heat dissipation
Size	120*48.3*45.9mm, 4.8"x1.9"x1.9"
Weight	0.35kg (0.77lb)

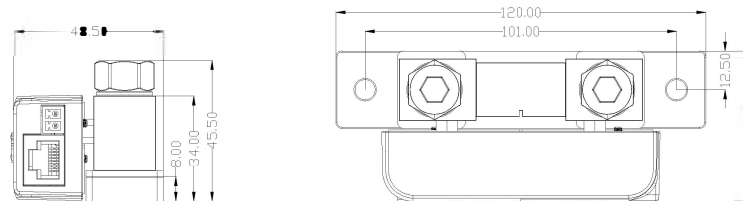
3. Installation Method

3.1 Product Size

Product size: 120*49*45.5mm

Mounting hole spacing: 101mm

Installation hole diameter: 6.5mm



3.2 Installation Instructions

- Wiring and installation must comply with national and local electrical codes. The wiring specifications must be selected according to the rated current, generally according to SA/mm' selected.
- Note that the exposed metal part of the Intelligent Shunt is the negative electrode of the battery during normal operation, and it cannot touch the positive electrode of the battery or other conductors, nor can it be connected to the earth;
- The installation location should be chosen to avoid direct sunlight, high temperatures, and places prone to water intrusion. Ensure that the area around the coulomb meter is well ventilated.
- Choose a suitable position to fix the two mounting screws on the HALSH48500, connect the wires according to the relevant application wiring diagram, and connect to the HAL48500 through HALCON POWER APP to set the product parameters.

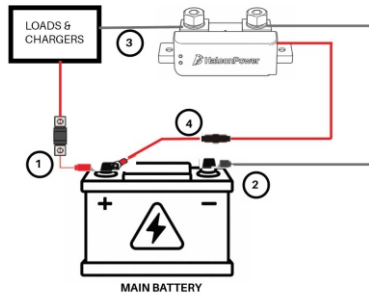
4. Typical applications

4.1 Monitoring the main battery

Connect the HALSH48500 to the DC energy storage system and battery, set the parameters in the Smart Phone APP according to the actual battery parameters, and monitor the battery's state of charge SOC, real-time battery voltage and current, remaining usage time, remaining capacity, protection alarms and other information.

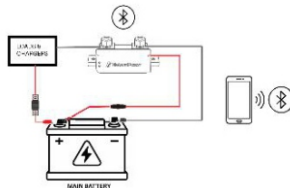
4.1.1 Wire the HALSH48500 as shown and described below:

- 1) Connect the positive terminal of the battery to the positive terminal of the DC system in series through a suitable fuse;
- 2) Connect the negative terminal of the battery to the "BATTERY MINUS" terminal (B) of the HALSH48500;
- 3) The negative terminal of the DC system is connected to the "LOAD MINUS" terminal (A) of the HALSH48500;
- 4) Connect the positive terminal of the main battery to the D-D1 port of the HAL48500 (Main Batt+) through the positive power supply line of the main battery



4.1.2 Connect to HALCON POWER APP

- Download APP & Connect to HALSH48500 via APP



4.1.3 Parameter setting

- **Battery Capacity**
Set this to match the actual capacity of your battery.
- **Full Charge Voltage**
This is the voltage level used to determine when the battery is fully charged. The system will mark the battery as **100% (fully charged)** when:
 - The battery reaches this voltage, and The charging current drops below the set cutoff level for a certain timeDefault values are used for standard battery types (lead-acid and lithium). For custom batteries, use:
 - **Lithium:** Full Charge Voltage = Overvoltage Threshold - 0.2 to 0.3V
 - **Lead-acid:** Full Charge Voltage = Float Voltage - 0.2 to 0.3V
- **Discharge Cutoff Voltage**
This is the voltage where the battery is considered **fully discharged (0% SOC)**. Default values are applied for standard battery types. For custom batteries:
 - **Lithium:** Cutoff Voltage = Under-voltage Warning + 0.2 to 0.3V
 - **Lead-acid:** Cutoff Voltage = Under-voltage Warning + 0.2 to 0.3V
- **Charge Efficiency Factor**
This adjusts how charging is calculated:
 - Lead-acid batteries: typically **1.25**
 - Lithium batteries: typically **1.0**Only adjustable in **Custom Battery Mode**. Use your battery datasheet if available.
- **Full Cutoff Current**
This is the current level used to confirm the battery is fully charged. Typically set to about **4% of battery capacity (4%C)**.
- **Full Detection Time**
The time the system waits before confirming full charge. Default is **1 minute**.
- **Current SOC Setting**
If you know the battery's actual state of charge, you can enter it here for better accuracy. If not, the system will calculate it automatically over time.
- **Sync SOC to 100%**
When the battery is fully charged, you can manually set SOC to **100%**. Otherwise, the system will adjust automatically.
- **Zero Current Calibration**
Disconnect the load from the **LOAD MINUS terminal**, then run calibration to set the current reading to zero.
- **Depth of Discharge (DOD)**
Default is **5%**. This is used to estimate remaining runtime. When battery capacity drops below this level, the remaining runtime will show **0**.

4.1.4 Alarm settings for Managing the Battery

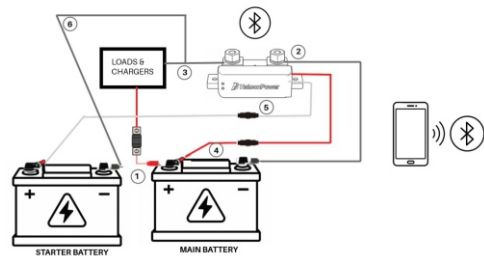
- SOC Alarm**
When enabled, an alarm will turn on if the battery state of charge (SOC) drops below the set level. The alarm will turn off once the SOC rises above the recovery level.
- Overcurrent Alarm**
When enabled, an alarm will turn on if the charge or discharge current exceeds the set limit. The alarm will turn off when the current drops below the recovery level.
- Main Battery High Voltage Alarm**
When enabled, an alarm will turn on if the battery voltage rises above the set level. The alarm will turn off when the voltage drops below the recovery level.
- Main Battery Low Voltage Alarm**
When enabled, an alarm will turn on if the battery voltage drops below the set level. The alarm will turn off when the voltage rises above the recovery level.
- Starting Battery High Voltage Alarm**
When enabled, an alarm will turn on if the starting battery voltage rises above the set level. The alarm will turn off when the voltage drops below the recovery level.
- Starting Battery Low Voltage Alarm**
When enabled, an alarm will turn on if the starting battery voltage drops below the set level. The alarm will turn off when the voltage rises above the recovery voltage.

4.2 Monitoring the main battery and starting battery

This application adds starting battery voltage monitoring on top of monitoring the main battery voltage. Start with 4.1 wiring and add the starting battery per the image below:

5) Connect the +ve terminal of the starting battery to the D-D2 port of the HALSH48500 (Starter Battery+)

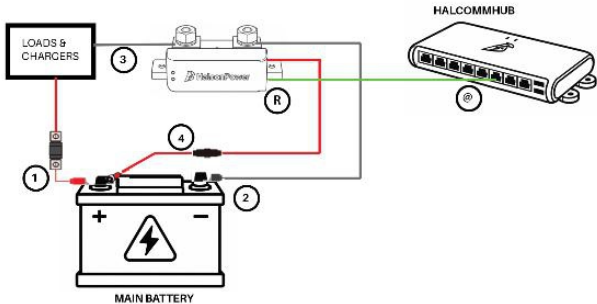
6)Connect the -ve terminal of the starting battery to the "LOAD -" terminal (A) of the HALSH500.



Now, connect to the APP and set relevant parameters as described in 4.1;

4.3 Connect to the HALCON POWER Communications Hub (HALCOMMHUB)

The operating information of the HALSH458500 can be sent to the HALCOMMHUB via RS485 communication cable, and can be viewed by connecting to the HALCOMMHUB unit through HALCON POWER APP. HALCOMMHUB shows the operating status of multiple HALCON devices or the entire DC system. On the basis of 4.1 wiring, connect RS485 communication cable to the HALCOMMHUB. @Connect the "RS485&CAN" communication of the coulomb meter to the RS485 communication port of the data acquisition control unit through the communication line. (COM1 ~COM6); @Connect to the APP and set relevant parameters as described in 4.1;



5. Indicator Lights

Indicator Light		Condition	Status description
	Bluetooth indicator light	Always on	Connected to APP,no data transmission
		flashing	There is data sending and receiving on the APP side
		Black	Not connected to APP
	Running lights	Red light	There is an alarm message
		Green light	Normal Operation

6. Common Problems and Solutions

Problem	Solution
Main Battery Light does not shine	Check whether the positive and negative poles of the battery and DC system are connected correctly. Is the "Main Batt+" terminal of the HALSH500 connected to the positive terminal of the battery.
Charging SOC deviation is large	Check whether the parameter settings of the HALSH500 are correct and if the HALSH48500 has experienced the battery fully discharge from full charge to the discharge cut-off voltage. The battery needs to be fully charged periodically to keep the SOC measurement accurate. Due to self-discharge characteristics, prolonged failure to fully charge the battery will cause cumulative current measurement errors.
The remaining usage time varies greatly	Check whether the parameters such as the discharge depth of the HALSH48500 are set correctly.

Limitation of Liability

To the maximum extent permitted by applicable law, the Halcon Power Ltd. shall not be liable for any direct, indirect, incidental, consequential, or special damages, including but not limited to property damage, personal injury, loss of use, loss of data, or financial loss, arising from or related to the use of this product.

The Company assumes no liability for damages resulting from, but not limited to, the following:

- Improper installation, application, use, or maintenance of the product, including use in an unsuitable or non-compliant environment
- Operation of the HALSH48500 outside its specified ratings, including exceeding current, voltage, or power limits
- Failure to follow the instructions, warnings, labels, or safety guidelines provided in this manual
- Unauthorized disassembly, modification, or repair of the product
- Damage caused by external factors, including but not limited to power surges, lightning, fire, water exposure, or other environmental conditions
- Events beyond the Hub Power Ltd.'s reasonable control, including acts of God (force majeure)

- Damage occurring during transportation, handling, storage, or installation after the product has been delivered
- Use of incompatible components, accessories, or batteries not approved or recommended by the Company

This product is intended for use only as described in this manual. Any other use may result in damage or injury and will void the warranty.