SWIFT LOONG

BiDC-X3 Bidirectional Charger User Manual

Bidirectional charging · Parked reverse-charge · SOS rescue · 1500W

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1. Safety instructions

The content of this chapter concerns personal and equipment safety. Read it completely before installing or using the product.

1.1 Important safety notes

Read this manual carefully before installing, operating or servicing the product, and keep it for future reference. The product must be installed by personnel with electrical knowledge. Although the DC circuits in a vehicle are low-voltage, the currents are very large — the BiDC-X3 can draw up to 160A at its input. Wiring mistakes, loose connections or undersized cables can cause overheating, equipment damage or even vehicle fire.

- Disconnect the battery negative terminal or the relevant fuse before wiring, and confirm the circuit is de-energized.
- Tighten all power terminals to the torque marked on the enclosure (M8: 8–10 N·m recommended) and re-check periodically.
- Do not expose the product to rain, water drops or dust; the mounting location must be dry and ventilated.
- Before modifying the vehicle electrical system, confirm that you do not compromise the vehicle's original electrical safety or warranty terms.

1.2 Battery work warnings

Batteries can produce flammable gas while operating. Never smoke or create sparks or open flames near batteries, and keep the battery area well ventilated.

- Wear safety glasses during battery work; avoid touching your eyes and wash your hands afterwards.
- Be extremely careful with metal tools — a tool dropped onto battery terminals can cause a short circuit. Remove rings, bracelets, necklaces and watches before working; the short-circuit current of a battery is sufficient to melt metal and cause severe burns.
- If electrolyte contacts skin or clothing, wash immediately with soap and water; if it contacts eyes, flush with cold running water for at least 15 minutes and seek medical attention.

1.3 Transport and storage

Store the product in a dry environment, away from rain, moisture and direct sunlight. Disconnect all wiring for long-term storage and keep the unit in its original packaging.

2. Product introduction

This chapter explains what the BiDC-X3 does, how bidirectional charging works and what is in the box.

2.1 What is the BiDC-X3

The BiDC-X3 is a 1500W bidirectional on-board DC-DC charger. While driving (ACC=ON), it converts power from the star battery side (LS) into charging current for the house battery side (HS) and simultaneously supplies 12V loads. When parked (ACC=OFF), it automatically reverses and delivers 13.2V / 80A to recharge the star battery, preventing a flat starter battery after long parking. In an emergency, one-touch SOS rescue can boost a depleted starter battery.



Figure 2-1 BiDC-X3 appearance (actual product)

Unlike one-way DC-DC chargers, the BiDC-X3 covers **driving charge, parked reverse-charge, load supply and emergency rescue** in a single unit — no separate isolator or jump-starter needed.

2.2 Key features

- **1500W bidirectional**: 93%–98% system efficiency; forward charging and reverse recharge in one device.
- **7 work modes**: 12V / 24V input, freely combined with 12V / 24V / 36V / 48V output (see 4.1).
- **Wide input**: 9–32V at the LS side, compatible with smart-alternator vehicles (Euro 5/6, China 5/6) and conventional alternators.
- **Independent Load output**: 13.2V / 60A continuous / 80A peak (30 s), directly powering 12V loads.
- **IGN(ACC) control**: 6–32V wide-range ignition detection; charge/discharge direction switches automatically.
- **CAN bus + Bluetooth APP**: parameter setup and live monitoring; integrates with vehicle energy systems.
- **Multiple protections**: input over/under-voltage, reverse polarity and over-current; output over-voltage, over-current, reverse polarity and short circuit; over-temperature derating/shutdown and low-temperature charge inhibit.

2.3 How it works

The BiDC-X3 uses a bidirectional DC-DC topology; the power flow direction is decided automatically by the ACC state:

ACC state	Power flow	Description
ACC = ON	LS → HS + Load	Driving charge: CC-CV charging of the house battery while powering 12V loads
ACC = OFF	HS → LS + Load	Parked reverse-charge: 13.2V / 80A output recharges the star battery and supports loads
SOS triggered	HS → LS	Emergency rescue: one-touch boost of a depleted starter battery (see 5.4)

2.4 What's in the box

Item	Quantity
BiDC-X3 bidirectional charger	1
Quick wiring diagram / manual	1
Warranty card	1
COMM connector with contacts	1 set

Note: Supplied accessories may vary by shipment; harnesses and connectors for volume/OEM projects can be configured per agreement.

3. Installation

Installation quality directly determines charging performance and electrical safety. Follow this chapter step by step.

3.1 Location and mounting

Choose a dry, ventilated location away from water drops and dust, and observe the following:

- Orient the cooling fins to favour natural convection; do not press the fins against a wall or other equipment, and leave free space around the unit — never cover it.
- Keep away from heat sources such as exhaust pipes, and away from direct sunlight and flammable materials.
- Keep high-current cables as short as possible — mount the unit close to the batteries to reduce voltage drop.
- Fix the unit to a flat, rigid surface through the mounting holes with screws or cable ties; make sure it cannot loosen or resonate in service.

3.2 Cable sizing and fusing

The BiDC-X3 can draw up to 160A at its input (DC-DC + Load simultaneously). Cables and fuses must be sized for the maximum continuous current:

- **Cable cross-section**: select for the maximum continuous current and cable length with sufficient margin. Undersized cables are the primary cause of overheating and excessive voltage drop.
- **Fuses**: fit a correctly rated fuse or breaker close to the battery/power side of each of the LS, HS and Load circuits.
- **Terminal torque**: M8 studs — 8–10 N·m recommended (per marking on the enclosure). Insufficient torque causes heating at high current; excessive torque damages the thread.

Note: Specific cable gauges, fuse ratings and polarity follow the quick wiring diagram supplied with the product. If in doubt, confirm with our technical support before wiring.

3.3 Connections overview

Interface	Function
LS± (M8)	Star battery side: power input while driving; reverse-charge output when parked
HS± (M8)	House battery side: forward charge output; energy source during reverse-charge
Load± (M8)	12V load output: 13.2V, 60A continuous / 80A peak (30 s)
COMM 8PIN	IGN(ACC), V-Sensor, Temp, CAN (see 3.5)
LEDs	Forward / reverse / standby / fault status and SOS rescue status (see 5.1)

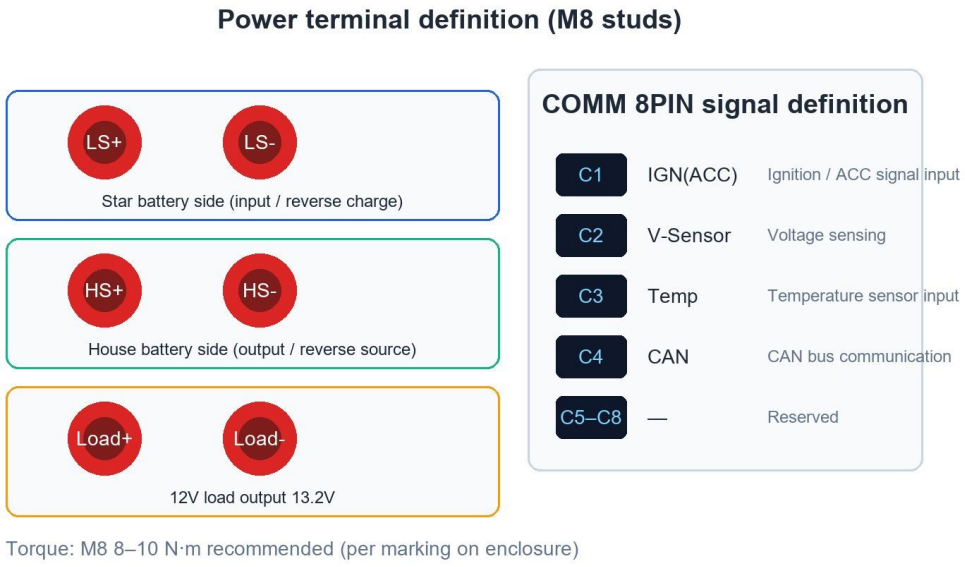


Figure 3-1 Power terminals and COMM 8PIN signals (schematic)

3.4 Main-circuit wiring

Follow the steps below and make sure all loads are off before wiring:

1. **Disconnect power**: open the negative terminals of the star and house batteries (or the relevant fuses/breakers) and confirm no current in the circuits.
2. **LS side**: connect the star battery positive and negative to LS± through a fuse; this circuit carries both driving input and parked reverse output.
3. **HS side**: connect the house battery positive and negative to HS± through a fuse.
4. **Load side**: connect the 12V loads to Load± through a fuse. Total load current must not exceed 60A continuous; for short-time high-power equipment observe the 80A peak (30 s) limit.
5. **Control wiring**: connect the COMM 8PIN harness as described in 3.5.
6. **Verify**: re-check all polarity and torque, then connect the star battery first, the house battery second, and power up — observe the LEDs (see 5.1).

Warning: Polarity and terminal silkscreen follow the quick wiring diagram supplied with the product. Reverse polarity, miswiring or insufficient torque can damage the unit or the harness; a loose high-current connection can overheat and burn.

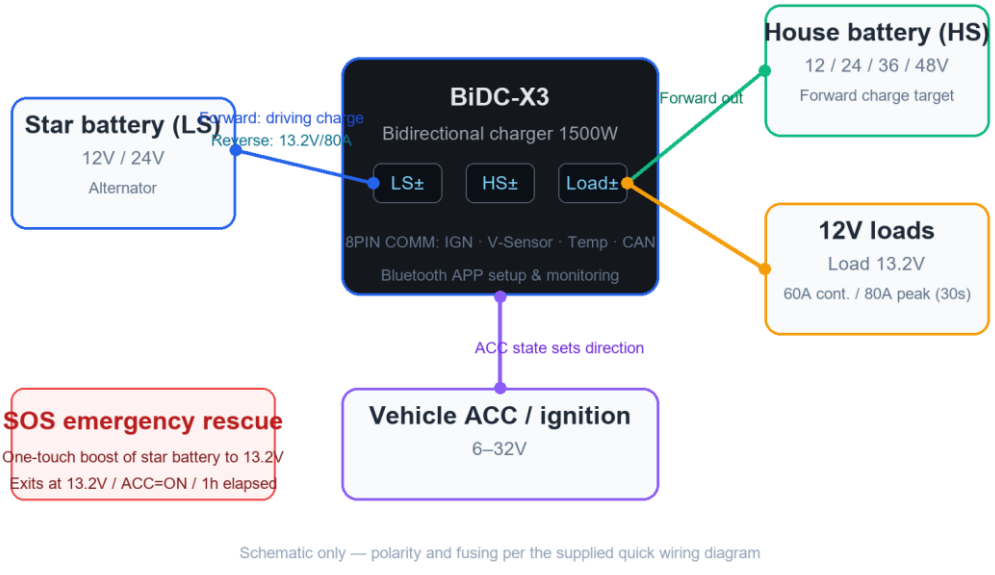


Figure 3-2 System wiring diagram

3.5 COMM control wiring

Pin	Signal	Description
C1	IGN(ACC)	Ignition / ACC input (6–32V); determines charge/discharge direction
C2	V-Sensor	Voltage sensing
C3	Temp	Temperature sensor input (affects compensation and derating)
C4	CAN	CAN bus communication to vehicle energy systems / host devices
C5–C8	—	Reserved (per enclosure silkscreen)

Take the ACC signal from the key switch ACC position or the ignition output so that "driving = ON, parked = OFF" matches the vehicle state. CAN protocol details and networking are available from technical support. Without a temperature sensor connected, the system assumes 0℃ (100% output, no temperature compensation).

4. Work modes & configuration

Before first use, confirm the work mode and charging parameters.

4.1 Seven work modes

The BiDC-X3 offers 7 work modes: 12V or 24V input, freely combined with 12V / 24V / 36V / 48V output. Choose the mode that matches the house battery voltage; every mode includes an independent Load output.

Mode	Input → Output	Load output
Mode 1	12V → 12V	12V

Mode 2	12V → 24V	12V
Mode 3	12V → 36V	12V
Mode 4	12V → 48V	12V
Mode 5	24V → 24V	24V
Mode 6	24V → 36V	24V
Mode 7	24V → 48V	24V

Note: The work mode sets the input/output voltage levels and **must be confirmed against the vehicle configuration before shipment**. If a change is required in service, do it via the Bluetooth APP or through technical support — never switch modes under load.

4.2 Charge/discharge control logic

After installation the unit runs fully automatically:

Condition	**Action**
ACC = ON (6–32V)	LS → HS + Load: driving charge while supporting 12V loads
ACC = OFF	HS → LS + Load: reverse output 13.2V / 80A recharges the star battery
Star battery < 12.2V	Charges up to 13.2V, then re-evaluates the ACC state
Reverse charge running 30 s	Disconnects from the star battery to avoid continuous back-feed
SOS triggered	Enters emergency rescue (see 5.4)
Load voltage at LVD threshold	Load output opens: default 11.8V (23.6V in 24V mode), +0.8V hysteresis,

	reconnect delay ≥30 s (10–120 s adjustable)

4.3 Bluetooth APP configuration

After connecting a phone over Bluetooth, the APP provides parameter setup and live monitoring, including the charge-current step, alternator preset and temperature-derating thresholds. The APP name and download method are given on the product leaflet and packaging.

4.4 Charge current and alternator matching

To protect the alternator, the forward charging current is set in steps according to the input-side system voltage, with alternator presets:

Input voltage	Range	Step	Default
12V mode	40–80A	20A	60A
24V mode	20–40A	10A	30A
36/48V mode	5–20A	5A	10A

Alternator presets (small / large alternator): 12V — 40A / 80A; 24V — 30A / 50A; 36/48V — 10A / 20A. Choose according to the alternator rating so that driving charge never overloads it.

4.5 Load output and LVD

The Load output is a regulated 13.2V supply rated 60A continuous and 80A peak (30 s). When the voltage falls to the LVD threshold (default 11.8V, 23.6V in 24V mode) the load output opens; it reconnects automatically once the voltage has recovered with the +0.8V hysteresis and the reconnect delay has elapsed (minimum 30 s, adjustable 10–120 s), protecting the battery from deep discharge.

5. Operation

This chapter covers status indication and special functions in daily use.

5.1 LED indicators

LED	Meaning
Forward	Forward charging in progress (LS → HS)
Reverse	Reverse recharge in progress (HS → LS)
Standby	Low-power standby (no charge/discharge task)
Fault	Protection triggered or unit abnormal; check the APP alarm details
SOS status	Emergency rescue in progress

LED colours and steady/blinking combinations follow the enclosure silkscreen and the APP display.

5.2 Forward charging (driving)

When the vehicle starts (ACC=ON), the unit automatically enters forward charging: the house battery is charged in CC-CV at the configured current step while the Load channel supplies the 12V loads. The unit exits automatically when the engine is shut down.

5.3 Reverse recharge (parked)

With ACC=OFF and the star battery needing a charge, the unit reverses and delivers 13.2V / 80A (60A at a 26.4V bus voltage) to the starter battery; each reverse-charge event stops automatically after 30 seconds to avoid continuous back-feed into the house battery.

5.4 SOS emergency rescue

If the starter battery is too flat to crank the engine, trigger SOS rescue: the unit delivers a high-current boost to the starter battery until the voltage reaches 13.2V, the ACC turns ON, or one hour has elapsed — whichever comes first. No supervision is required.

Note: SOS rescue draws energy from the house battery; recharge it as soon as possible afterwards. A deeply discharged, sulphated or shorted starter battery may not recover through SOS and needs professional service.

5.5 Temperature protection and derating

The operating temperature range is −20℃ to +85℃. Without a temperature sensor the system assumes 0℃ (100% output). Above the derating threshold band the output current falls linearly from 50% to 0%; thresholds are configurable in the APP. The unit also implements over-temperature derating, over-temperature shutdown and low-temperature charge inhibit.

6. Troubleshooting

Symptom	Possible cause	Remedy
Unit dead, no LEDs	No power at LS, blown fuse, loose wiring	Measure LS terminal voltage; check fuses and terminal torque
No charging while driving	ACC signal missing, charge step set too low, insufficient alternator output	Check C1 IGN(ACC) wiring and voltage; verify APP settings; confirm alternator rating
Charge current well below setpoint	Temperature derating, undersized cables, house battery nearly full	Check ambient temperature and ventilation; increase cable size or shorten runs; judge by APP live data
No reverse charge when	ACC state misdetected,	Check ACC wiring; verify

parked	reverse function disabled, house battery low	APP settings; recharge the house battery and retry
Load output keeps dropping out	Load exceeds 60A total, LVD threshold set too high	Audit load power; adjust LVD threshold and reconnect delay as needed
Fault LED on	Over/under-voltage, over-current, short circuit or over-temperature protection	Disconnect power, inspect loads and wiring, then restart; if it persists, contact technical support
APP cannot find the device	Bluetooth permission missing, unit asleep, too far away	Reopen the APP and grant Bluetooth permission; wake the unit and move closer

Tip: For issues you cannot resolve, note the LED status and APP alarm details and contact technical support.

7. Technical data

Item	**Specification**
Work modes	7 modes (see Table 4-1)
Bidirectional charge/discharge	Supported
IGN(ACC) control	Supported, 6–32V
System efficiency	93% – 98%
Input protection	Over-voltage / under-voltage / reverse polarity / over-current
Output protection	Over-voltage / over-current / reverse polarity / short circuit

Temperature protection	Over-temp derating / over-temp shutdown / low-temp charge inhibit
Power terminals	LS± / HS± / Load± — M8 studs
COMM interface	8PIN connector — V-Sensor / IGN(ACC) / Temp / CAN
SOS emergency rescue	Supported, automatic exit
LED indicators	Forward / reverse / standby / fault, plus SOS status
Item	**Specification**
Rated power	1500W
Forward input	LS side 9–32V wide range, max input current 160A (DC-DC + Load)
Forward charge current	12V mode 40–80A (20A steps, default 60A); 24V mode 20–40A (10A steps, default 30A); 36/48V mode 5–20A (5A steps, default 10A)
Alternator presets	Small / large alternator: 12V 40A / 80A; 24V 30A / 50A; 36/48V 10A / 20A
Reverse output	HS → LS at ACC=OFF: 13.2V / 80A, auto-disconnect after 30 s
Reverse current	80A @ 13.2V bus; 60A @ 26.4V bus
Load output	13.2V · 60A continuous · 80A peak (30 s)
LVD low-voltage disconnect	Default 11.8V (23.6V in 24V mode), +0.8V hysteresis, reconnect delay 10–120 s adjustable
Operating temperature	−20℃ ~ +85℃ (linear derating above threshold)

Communications	CAN bus · Bluetooth APP (setup & live monitoring)

Battery chemistry support, static draw, dimensions and weight are subject to the latest official datasheet, available from technical support.

8. Appendix

8.1 Warranty

One year warranty from the date of purchase (repairable for non-human-induced issues). Keep your proof of purchase and follow the manufacturer's return process during the warranty period.

8.2 Customization

OEM / ODM supported: logo, housing, parameters and function modules can be customized per project; factory pre-configuration available for volume vehicle programs.

8.3 Contact

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