Ultra-Starter 12V

Energy that makes you fly

UST-2012LV (*Light Vehicles*)

IMPORTANT NOTE

All users must read this entire guide before initiating operations with the UST-2012LV

January 2024
ENERCRAFT

Thank you and congratulations for the purchase of your new Ultra-Starter.

This Ultra-Starter unit provides 12 Vdc (13.6 @ full charge) electrical ground power for aircraft engine starts.

UST-2012LV (*Light Vehicles*)

Following correct procedures and knowing the limitations and best practices for using the Ultra-Starter equipment will ensure maximum operational efficiency and maximize the capabilities and ultimate useful life of the unit.

This User Guide contains the operating instructions and procedures for the Ultra-Starter UST-2012LV, needed to safely and efficiently operate this unit.

Remember you can always combine our Ultra-Starter units with our Dual Connector, and get more power when needed!

Enjoy the freedom of working without limitations!

1. INTRODUCTION

The UST-2012LV is a maintenance-free and sealed unit. No repairs by the User are authorized. Warranty will be voided if the unit is tampered in any way, or if unauthorized repairs are made. For technical support please contact:

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alberto.jurjo@enercraft.eu
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Worldwide

CAUTION

SHOCK HAZARD POTENTIAL

Improper use or failure to follow instructions contained in this User Manual can result in the unit damage and/or injury or death by electrical shock.

Any attempts to open or examine the inside of the UST-2012LV via any tool or any device (borescope, probe, etc...) can result in the unit failure and/or injury by electrical shock. These Ultra-Starters are maintenance free and should not be opened or disassembled for any reason.

Always protect the units from short circuit.

Shipping Hazards: The UST-2012LV contains LiFePO4 cell batteries. These equipment must be shipped according to directive UN 3481.

2. BASIC PRODUCT DESCRIPTION

The Ultra-Starter UST-2012LV is a device developed by **ENERCRAFT** to improve the engine start of airplanes or helicopters, providing clean energy and extending the life of the engines, being capable of operating in any weather and environmental condition.

The equipment must be connected through the external power connector to the aircraft. The Ultra-Starter units were developed to offer the latest technology in energy storage, with a unique configuration, by combining the best of Lithium batteries and the best of Ultracapacitors.

3. MAIN FEATURES

1 Incorporates the latest technology

IEC 61000 & IEC 60335-1
UN38.3
Meets ICAO / IATA regulations

ENERCRAFT innovative design
First to incorporate Lithium & Ultracapacitor technology
Full operation in any weather and environmental condition
Peak current is ensured, even in non-ideal charge conditions
Extends & preserves the aircraft main battery useful life
Supports more engine starts without recharge
Provides clean energy and a more efficient engine start
True DUAL UNIT. Works as a Starter and as a GPU (7 Amp)

2 Full data display

Voltage and Battery load %

3 Protective Case

Reliable waterproofing (IP67 & IEC 60529)
NANUK®'s latching system (MIL-STD-810F)
Impact resistant (ATA Specification 300)
Robust (ASTM D4169 DC-18)

4 Portable equipment

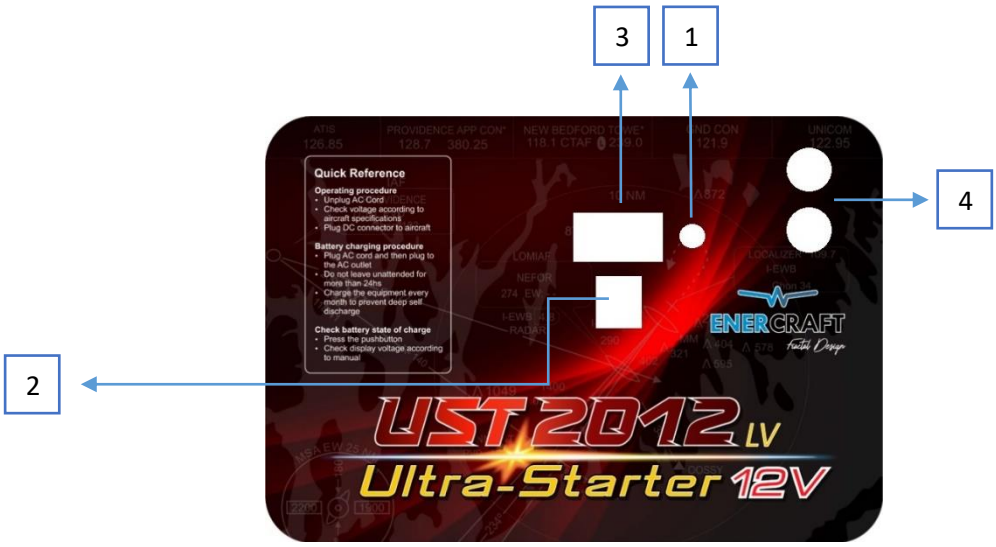
Lightweight unit
“All in one” concept
One-handed operation
Spring loaded handle
Reinforced metal padlock holes

4. SPECIFICATIONS AND PERFORMANCE

MAIN SPECIFICATIONS OF THE ULTRA-STARTER UST-2012LV	
AC INPUT	Charges from Single Phase 85-264 Vac, Freq. 47/63 Hz, 0.75 amps
DC OUTPUT	12 VDC. (13.6@full charge) Peak start: 750 Amp Use as GPU: up to 7 Amps
RECHARGING RATE	45 minutes from full discharge @ 25° C
TEMPERATURE RANGE	- 40° C ↔ 70° C (in operation) - 50° C ↔ 85° C (in storage)
DIMENSIONS	391 mm x 307 mm x 173 mm
WEIGHT	7 kg (including cable and AN2551)
CABLE	1.5 mts Standard 3 PINS NATO AN2551 (35mm²)
PROTECTION	Electronic sensors & Fuses
COOLING	Cooling air system integrated into the equipment

5. PANEL OVERVIEW

1. Pushbutton power switch
2. AC input and fuse w/holder
3. DISPLAY: Battery load level and output voltage indicator
4. DC output



6. OPERATING PROCEDURE

6.1 Receiving your Ultra-Starter UST-2012LV

Please check the overall status of the unit to make sure that it hasn't been tampered in any way during the Shipment and/or potential Customs inspections. If you detect anything, please contact us immediately.

Due to the time needed to pack and deliver your Ultra-Starter from our factory to your hangar or operational base, and due to the existent regulations for shipping Lithium batteries (we must discharge the cells in a 30%), your unit won't be ready to be used once you receive it.

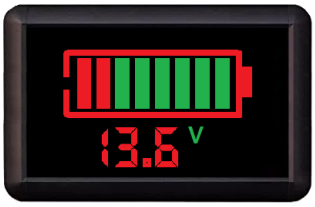
To be completely sure, please check first the battery status. The voltage may be below **12.0V**, which means that you must proceed to its first full charge. For this first charge, we recommend you to charge the equipment for, at least, two (2) hours. The unit can reach a maximum voltage of **13.6V** before that time, but please keep it charging for this first full charge only, in order to stabilize the batteries.

After two (2) hours, your new Ultra-Starter will be ready to be used! Please check the voltage again to confirm that it has reached more than **13.0V**, and you can initiate normal operations to start the engines of all your aircraft.

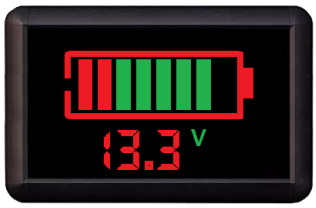
6.2 Normal operations. DISPLAY reading and understanding

Once you start using the unit you may see that the voltage remains almost constant for a while. This is an advantage and a characteristic of the Lithium cells, which will improve the energy delivery efficiency of the Ultra-Stater. But, at some point after some engine starts (amount depending on type of engine/s or environmental factors), the display will show changes, according to the sequence below.

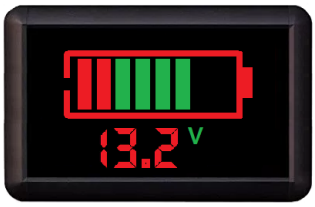
Please follow the indications shown:



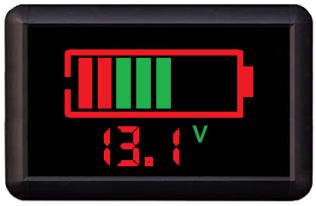
The output voltage will gradually drop from the initial **13.6V**, down to **13.3V** and all the LEDs (2 red and 6 green LEDs) will remain ON during this process.



At **13.3V**, the first green LED will fade out. But the unit can still be used.

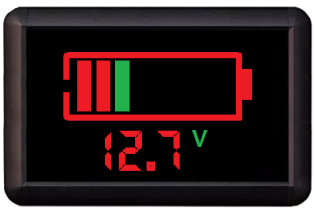


At **13.2V**, the second green LED will fade out too. But the unit can still be used.



At **13.1V**, the third green LED will fade out too. But the unit can still be used.

At **13.0V**, the fourth green LED will fade out too. But the unit can still be used.



At **12.7V**, the fifth green LED will fade out too. But the unit can still be used.

At **12.6V**, the sixth green LED will fade out too. But the unit can still be used.

At **12.3V**, the first red LED will fade out too. If the unit reaches **12.0V**, the last red LED will start flashing, alerting the operator that the unit needs to be recharged IMMEDIATELY.

We strongly recommend you to fully recharge the unit when reaching that voltage level (12.0V). If you keep on using the unit beyond that point, its Lithium cells will enter into critical voltage levels.

If that happens, please be aware that the battery life may be compromised, and the Lithium cells can lose their properties. A full repair service and replacement of all the cells may be needed.

6.3 Check battery status

- Press Pushbutton power switch
- Check display. If voltage is less than **12.0V**, please re-charge the unit.

6.4 Check cables status

- Always check the cables to visually detect any possible cuts or damages.

6.5 Engine starting procedure

- Unplug AC Cord (if the unit is plugged in).
- Plug DC connector to the aircraft.
- Proceed with starting the aircraft engine.
- Unplug the DC connector from the aircraft.

6.6 Battery charge procedure

- Plug AC Cord to a properly grounded outlet.
- The unit will charge in 30 minutes from full discharge. When the voltage reaches **13.6V**, then the unit is fully charged again.
- During the charging process, it is normal to feel an electrolyte smell. The 3.2v LiFePo4 batteries of the equipment, are prismatic cells prepared for high currents, and have ventilation that can result in the User perceiving that smell.

- Always charge the Ultra-Starter units on a well ventilated area.
- **NOTE**: If the units are not in use, they do not have to be charging if the voltage is still above **12.0V**. The configuration of these units and the Lithium batteries will avoid strong discharges if the units are stored or not in operation for short periods of time.

6.7 Use of the unit as a GPU

You have two options to use the Ultra-Starter as a GPU:

OPTION 1 - PLUGGED IN - Power coming from the Switching Power Supply

The **ENERCRAFT** Ultra-Starter UST-2012LV has an internal Switching Power Supply and can work as well as a GPU, delivering up to 7 Amps continuously (no time limit) if the unit is plugged in. For that use:

- Plug AC Cord to a properly grounded outlet.
- Plug DC connector to the aircraft.
- Proceed with the necessary tasks.
- Unplug the DC connector from the aircraft.

OPTION 2 - NOT PLUGGED IN - Power coming from the Lithium Batteries

For those situations when you are working outside the hangar, you have landed in a remote location, you need higher currents (more than the 7 Amps provided by the Switching Power Supply) for a short period of time or you just got stuck somewhere in the field and you need an external energy source to power the aircraft, our Ultra-Starters are fully ready to deliver that power too.

Due to the energy stored in its High Quality Prismatic Lithium Batteries, the unis can be used remotely (without being plugged in) and can deliver the power needed to switch on the avionics, to power other electronic equipment, or to recharge the aircraft batteries, for example...

For that use, with the AC Cord unplugged:

- Plug DC connector to the aircraft.
- Proceed with the necessary tasks.
- Unplug the DC connector from the aircraft.

In the case of the UST-2012LV, with 20Ah batteries, the unit would deliver 20 Amp for 1 hour, or 10 Amp for 2 hours in a row.

The time estimated above is considering taking the equipment almost to its total discharge, which is not advised. Please remember the critical voltage levels indicated in 6.2 above. When the voltage reaches **12.0V**, we strongly recommend you to recharge the unit.

7. STORAGE

IMPORTANT NOTE: The Ultra-Starter units cannot be stored uncharged for long periods of time, without any use. It is highly recommended to check the batteries often and charge the units if the Ultra-Starters UST-2012LV are not being used, to avoid full battery discharge. Be aware that the battery life may be compromised, and the Lithium cells can lose their properties. A full repair service and replacement of the cells may be needed if the units are left unattended and discharged for more than 30 days.

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