
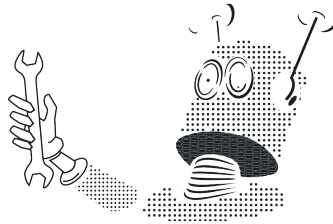


Safety

 Read this important safety information before using your new Dephy product

Ignoring the instructions on this page could result in broken electronics, robots, or computers or physical injury.



General

Dephy makes products for professional researchers to use in the laboratory environment. The information contained in this and other Dephy materials is intended to support your efforts to safeguard your users and service personnel. You need to consider and assure all aspects of safety for your particular use of our products, including:

- Identify the energy sources used (such as electrical and mechanical)
- Measure the energy levels they produce (such as thermal, mechanical, electrical, optical, acoustical)
- Determine whether the energy from the sources is hazardous
- Identify how energy can be transferred to a body part (such as conduction, convection, kinetic energy, optical, acoustic)
- Determine appropriate safeguard schemes:
 - To protect defined individuals against pain and injury from the classified energy sources
 - To reduce the likelihood of injury or property damage due to an electrically caused fire originating within the equipment
- Measure the effectiveness of those safeguards

Do not disassemble Dephy products

Do not modify Dephy products

Many products have moving parts (motors, shafts, belts)

- Keep fingers away from pinch points
- Keep your work surface tidy to avoid entanglement
- Always secure components to the work surface for bench top experiments

Only use genuine Dephy accessories with your Dephy products

Electrical

We recommend using a bench top power supply instead of batteries whenever possible. Use a high-quality power supply with a current-limit, and adjust that limit in accordance to be just above the maximum current required by your experiment.

- A power supply that goes in a temporary protection mode (ex.: if the current is exceeded, or if regenerated current raises the voltage) can lead to instability and unexpected behaviors, as the control loops try to compensate for the lower bus voltage.
- During development, always monitor +VB and Battery current in the GUI. This allows you to set the proper limits.

Using a USB cable and a power source (battery or power supply) can lead to problems if the power source is disconnected during an experiment. Large currents will flow through the USB cable, and they may break the embedded system or your computer.

- Always use an isolated USB adapter (ex. [SMAKN USB Isolator](#))
- If you can, use Bluetooth instead of USB.

Configure the Programmable Fuse (I²t) and UVLO of your products

Batteries can be dangerous! We highly recommend using the Dephy BA30 battery, as it offers built-in safety features, instead of using unprotected cells/packs.

Mechanical

1. The brushless motors used in the ActPack and the ExoBoot have very high torque constants. Use extreme caution when manipulating and using the products.
 - Whenever possible, design mechanical fuses or limits to protect your users.
 - Users need to provide strain-relieving for all cables.

Software

The Dephy Demo Scripts are provided as examples only.

- We cannot guarantee that they work with your system (OS, library version, embedded computer)
- We cannot guarantee that they won't behave differently after an update
- Always test on a bench top ActPack, with a motor that's free to move
- We cannot promise that the motor will enter a safe state if the script crashes

Users are responsible for writing the proper safety code, exception handling, etc.

Review the difference between USB and Bluetooth regarding controls; with USB, the Write bandwidth is extremely limited.

BA30 Battery

- BA30 is intended for use by academic and industrial researchers in a controlled environment.
- Do not disassemble battery
- Do not puncture battery
- Do not drop battery
- Avoid placing battery packs on surfaces higher than 2.5 meters to avoid drops
- Inspect any dropped battery for cracks; remove any battery with visible damage from service
- Remove any battery dropped for more than 1.2 meters from service
- Do not submerge battery in any liquids
- Do not short the output of the battery
- Do not leave the battery in direct sunlight for extended periods.
- Do not operate the battery beyond a temperature range of -10 °C to 45 °C. When beginning cold weather operation, start with a fully charged battery at room temperature.
- Do not charge the battery until battery temperature has reached room temperature.
- Inspect BA30 terminals before use to ensure connector integrity
- Inspect BA30 terminals before use and remove any debris (using a non-conductive tool)
- Only use Dephy chargers and accessories (Smart Dock, Receptacle)
- Only use battery with BA30 Receptacle or Dephy product (ex.: EB60) to prevent connector damage
- Do not leave charging batteries unattended for longer than 1.5 hours
- Contact Dephy if a battery does not exit Nap mode after the wake-up procedure
- Do not use battery outside the operating conditions listed in the specifications
- Place batteries stored for more than two months in Nap Mode, after charging them to 50%

- Do not leave the BA30 battery in an unpowered charger, as it will discharge the battery to an un-stable state.
 - A LiPo safe bag is provided if your battery becomes damaged. The best practice is to store any unused LiPo batteries in a LiPo bag until ready for use.
 - Dephy batteries are designed with several safety features to minimize the risks of creating hazardous conditions. One safety mechanism is the venting of gasses in the event of an internal short within the battery cells. The gas released by a venting Li-ion cell is mainly carbon dioxide (CO2). Other gases that form through heating may contain vaporized electrolyte consisting of hydrogen fluoride (HF), and phosphoryl fluoride (POF3), combustion products and organic solvents ¹ In the event of a battery vent occurrence:
 - Disconnect any charger or load.
 - Place battery in a LiPo safe bag or similar container and move battery to an area with good ventilation.
 - Ventilate the room and vacate area if smoke and gases are present.
 - A fire involving Dephy products, including LiPo batteries, can be handled like any other combustible fire. For best results, use a foam extinguisher, CO2, ABC dry chemical, powdered graphite, copper powder or soda (sodium carbonate).
 - If a semi sweet smell is detected emanating from the battery, place the unit in LiPo safe bag and contact Dephy.
 - Contact Dephy for appropriate shipping directives before returning a defective or damaged battery ¹
- ¹ For more information, please refer to [BU-304a: Safety Concerns with Li-ion](#)

i We appreciate that you took time to read our safety instructions.

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Revision	C_0001_DS_0003_V01_SAFETY
Created by	Carlos Asmat
Reviewed by	Sarah Gardner  <small>Sarah Gardner (Nov 26, 2024 09:59 EST)</small>
Approved by	Matt Mooney 
Purpose	Safety Guide for Dephy Products that has been reviewed and approved for release









C_0001_DS_0003_V01_SAFETY

Final Audit Report

2024-11-26

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