

ETC Labs #lighthack Tech Services Guide Rev 1a

Table of Contents

Overview	1
ETC Technical Services #lighthack Support Script.....	2
Appendix A: Links	5
Appendix B: Parts List	5
Appendix C: LED guide for Arduino.....	6

Overview

The #lighthack project is an ETC Labs effort to connect with a technically curious audience and provide inspiration for others to create innovative ways to interact with Eos.

The first project, Box 1, is a device built on the Arduino platform that allows users to customize encoders and buttons to interact with Eos over OSC (connected via USB). ETC Labs provides sample code to get started, but encourages customer experimentation.



It's important to note that this isn't an official ETC product, and support is slightly different. Tech Support instead has a support script – something we rarely otherwise have – designed to help you get started. In the spirit of ETC Labs, we're also sharing this script with you! This will be a living document, and will be updated periodically.

ETC Technical Services #lighthack Support Script

- What is #lighthack?
 - #lighthack (“Light Hack”) is an ETC Labs effort to allow you to experiment with interacting with Eos over OSC, both in the realm of hardware and coding. It’s an educational tool that is community-supported on our forums. I can answer some basic questions regarding initial setup if you have them. For most of the hardware and coding experimentation you may want to do, the forums will be the best place for help and answers. I can provide a link if you would like.
 - <https://community.etccconnect.com/etclabs>
- What’s in the box?
 - Our kit includes an Arduino Uno, switches, encoders, wires, and a project box. The box doesn’t have holes cut out in them – you’ll need to spend some time with a drill and other tools. There are instructions for building the kit on ETC Lab’s GitHub page and the ETC #lighthack forum.
 - https://github.com/ETCLabs/lighthack/blob/master/box_1/assembly_instructions.pdf
 - <https://community.etccconnect.com/etclabs>
- What does the box 1 sample code do?
 - The sample code provided by ETC includes the following Eos commands: pan, tilt, fine, next, and last. Each encoder and key will be assigned to these commands, but we welcome you to experiment with coding as well as the physical box to see what else you can make. ETC Labs has a forum that would be a great resource for this experimentation, I can give you the link if you would like!
 - <https://community.etccconnect.com/etclabs>
- I think I have a bad piece of hardware
 - What part are you having trouble with?
 - **Arduino** – We have a test sketch that may be helpful for this. Can you load the USB test Arduino sketch from GitHub on the device to help us verify functionality? I would like us to get back to a consistent starting point to ensure that the basic connectivity still works. I can send you the link to download the code if you would like.
 - <https://github.com/ETCLabs/lighthack>
 - **If the test sketch works, and it was something to do with the connection with Eos** – Yes, it seems like your script may not have been doing what you want, as the test script seems to be working as we’d expect. I’m not a scripting expert, so I’d recommend that you ask the #lighthack user group. There is a forum where you can post your code and get help. If you’re by a computer or something to write with, I can give you that link now.
 - <https://community.etccconnect.com/etclabs>

- **Other electrical parts** – Did these components previously work? Use an Ohm meter or other methods to verify if the parts are working. Refer to the Troubleshooting guide in the Assembly Instructions.
 - **If not** – Unfortunately it seems you have a bad <<component>> See the parts list to source a new one.
 - **If so** – Yes, that can be the nature of experimenting with electronics. You may need to order a new part – it sounds like this has failed.
 - See Appendix B for parts list
- How can I get replacement parts?
 - The parts list, including the part numbers for each piece, is at the top of your assembly guide. I can send you that list if you like. You can go through the ETC webstore or ETC customer service for some of the part numbers, and all the parts are also available from Amazon or other online stores.
 - [Parts list is Appendix B of this guide](#)
 - https://github.com/ETCLabs/lighthack/blob/master/box_1/assembly_instructions.pdf
- How do I get the box 1 sample code?
 - The sample code is hosted on the ETC Labs GitHub page – are you near your computer? I can give you the link.
 - <https://github.com/ETCLabs/lighthack>
- How do I load the box 1 sample code to the Arduino provided by ETC?
 - We have a handy assembly guide that includes steps to loading the code to your Arduino. I'd be glad to walk you through it. Can I send you a link to that guide so we can walk through it together?
 - https://github.com/ETCLabs/lighthack/blob/master/box_1/assembly_instructions.pdf
- How do I know if the Arduino works?
 - The ETC Labs team has provided some sample code on their GitHub page, along with assembly instructions that include steps to loading the code and troubleshooting steps to verify communication – I can send you a link to that and we can walk through it together if you would like.
 - https://github.com/ETCLabs/lighthack/blob/master/box_1/assembly_instructions.pdf
 - If you have loaded either the box 1 sample code or USB test sketch code to your Arduino, you should see a variety of LEDs on the Arduino. That list is at the bottom of the #lighthack Box 1 assembly instructions. I can send you the link to reference if you would like.
 - https://github.com/ETCLabs/lighthack/blob/master/box_1/assembly_instructions.pdf
- Not sure if the test sketch or box 1 sample sketch is working
 - Let's look at the Arduino LED guide from the end of the Box 1 assembly guide and the source code's explanation of what it should accomplish. You should see <<example A on Eos>> on the Arduino and <<example B>> on the Eos machine.
 - You aren't seeing that? Let's take a look at the troubleshooting steps in the guide to see what we can figure out. I can also send you the link to Arduino's troubleshooting guide and we can walk through that together.
 - https://github.com/ETCLabs/lighthack/blob/master/box_1/assembly_instructions.pdf

- <https://www.arduino.cc/en/Guide/Troubleshooting>
- Information on where community support is, where to post feature requests, location of any #lighthack documents published by ETC
 - Lighthack is meant to be a community supported effort via the #lighthack forum on ETC's website and the ETC Labs GitHub page, where you will find all related documentation, code, and discussions. The forum is a great place to ask questions, make suggestions, and look to see what others have asked or suggested, while GitHub will have more of the actual code. ETC has a landing page that will direct you to either, if you are near a computer I can give you the link.
 - Landing page: <http://www.etcconnect.com/etclabs/>
 - Forum: <https://community.etcconnect.com/etclabs>
 - GitHub: <https://github.com/ETCLabs/lighthack>
- Information on OSC commands, from the Eos side
 - The Eos Show Control User guide has a published list of OSC commands. There are a lot of commands available – if you have any questions about particular commands, I'd be glad to offer advice. (Segue into normal ETC level support – it's supporting a feature of an Eos console).
 - (This would mean a bit more training on the structure of an OSC command as Eos expects it)
- Internal escalation path if they need to discuss topics Tech Services does not handle
 - Have you posted on the forum regarding this or searched to see if your question has been previously asked and answered?
 - **if not** - The forums will have a lot of information and answers that may include what you are looking for. If you don't see it posted, I would suggest making your own inquiry. You can get a response that way and others who may have the same question in the future can also reference that post.
 - **if yes** - I am sorry you are having trouble getting the information you need. Let me give you our lighthack team's email address, and someone from the team will be able to provide assistance.

Topics Tech Services aren't familiar with [these should be taken to the Community Forums]:

- Questions about any #lighthack programs besides the test and box 1 sample programs provided
- Modifying any schematics
- Discussing alternate assemblies
- Modifying any code
- Viewing or debugging code
- GitHub functionality beyond a simple download
- Loading the sample code to other Arduino models or other Microcontrollers not provided by ETC

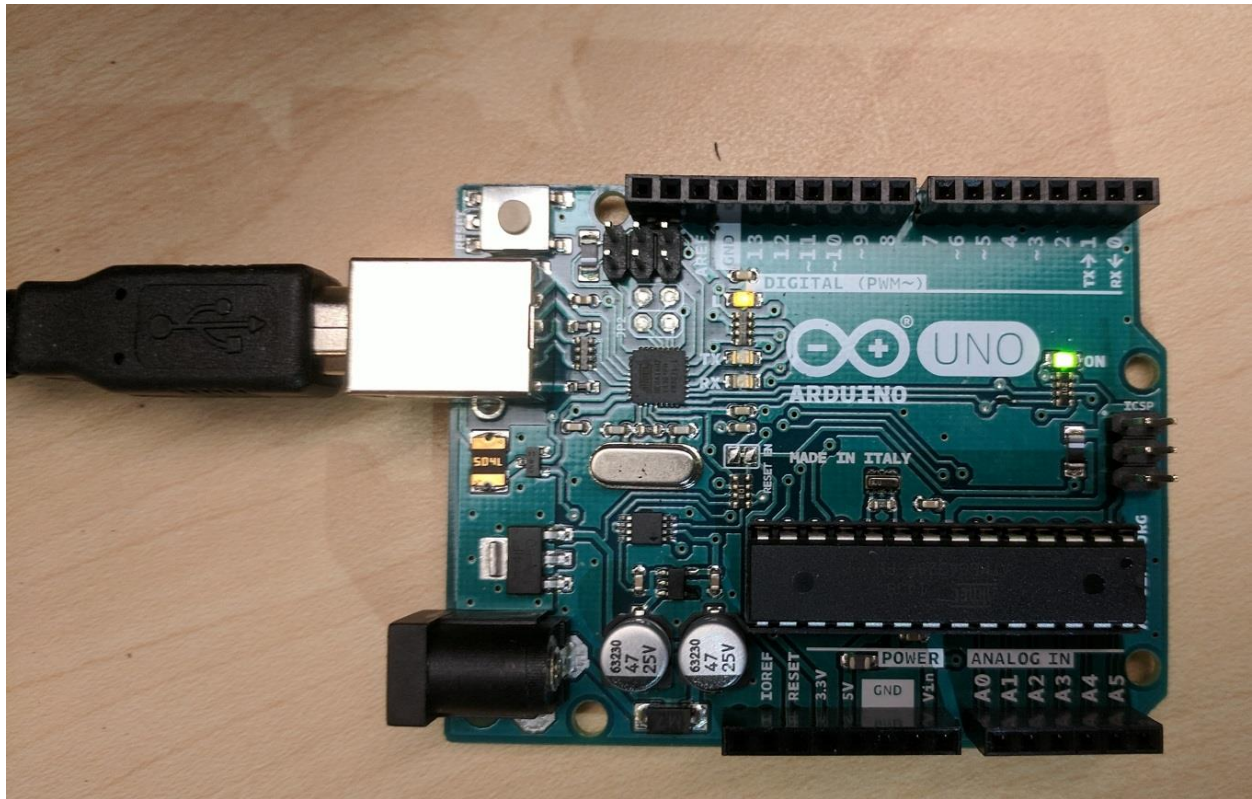
Appendix A: Links

- ETC Labs landing page: <http://www.etcconnect.com/etclabs/>
- ETC Labs forum: <https://community.etcconnect.com/etclabs>
- ETC Labs GitHub page: <https://github.com/ETCLabs>
- Box 1 Assembly Instructions download page:
https://github.com/ETCLabs/lighthack/blob/master/box_1/assembly_instructions.pdf
- Arduino's troubleshooting page: <https://www.arduino.cc/en/Guide/Troubleshooting>
- Basic GitHub introduction: <https://guides.github.com/activities/hello-world/>

Appendix B: Parts List

- 1 Arduino Uno R3: [4201B9001](#)
- 1 HD44780 Display Module: [DS221-F](#)
- 3 Cherry MX Red Key Switch: [s846-F](#)
- 3 Black Eos-Style Key Cap: [4152A4039](#)
- 2 Rotary Encoder with Panel Mounting Hardware: [L1243-F](#)
- 2 Finger Wheel for Rotary Encoder: [4201A4003](#)
- 1 10 kΩ Potentiometer: [4240B7011](#)
- 1 Red Wire Solid Core 22AWG 2-3': [4201B7001](#)
- 1 Black Wire Solid Core 22AWG 2-3': [4201B7002](#)
- 1 White Wire Solid Core 22AWG 2-3': [4201B7003](#)
- 1 Yellow Wire Solid Core 22AWG 2-3': [4201B7004](#)
- 1 Blue Wire Solid Core 22AWG 2-3': [4201B7005](#)
- 3 5-position Wago Wire Connector: [J4630](#)
- 1 3-position Wago Wire Connector: [J4629](#)
- 1 USB Cable, A to B: [W6378](#)
- 10 Machine screws #2-56x3/16": [HW0006](#)
- 5 Standoffs #2-56x1/4": [HW9489](#)
- 5 Standoffs #2-56x1/2": [HW9490](#)
- 1 Enclosure with lid and screws: [4201A4001](#)

Appendix C: LED guide for Arduino



LEDs to be aware of:

- ON (green): power presence
- L (amber): presence of code
- TX (amber): transmitting data
- RX (amber): receiving data

When you plug the Arduino in for the first time [no sketch loaded]:

- On: solid
- L: possibly blinking
- TX: off
- RX: off

When you are loading sample or test code to the Arduino:

- On: solid
- L: will go off
- TX: flashing then solid
- RX: flashing then solid

When you have loaded the USB test sketch, but are not connected to a compatible Eos machine:

- On: solid
- L: solid
- TX: heartbeat
- RX: off

When you have loaded the USB test sketch, and are connected to a compatible Eos machine:

- On: solid

- L: solid
- TX: heartbeat
- RX: heartbeat

When you have loaded the Box 1 sketch, but are not connected to a compatible Eos machine:

- On: solid
- L: will go off
- TX: flashing then solid
- RX: flashing then solid

When you have loaded the Box 1 sketch, and are connected to a compatible Eos machine:

- On: solid
- L: solid
- TX: flashes when you move pan/tilt or hit next/last on the box
- RX: flashes when you move pan/tilt on Eos machine