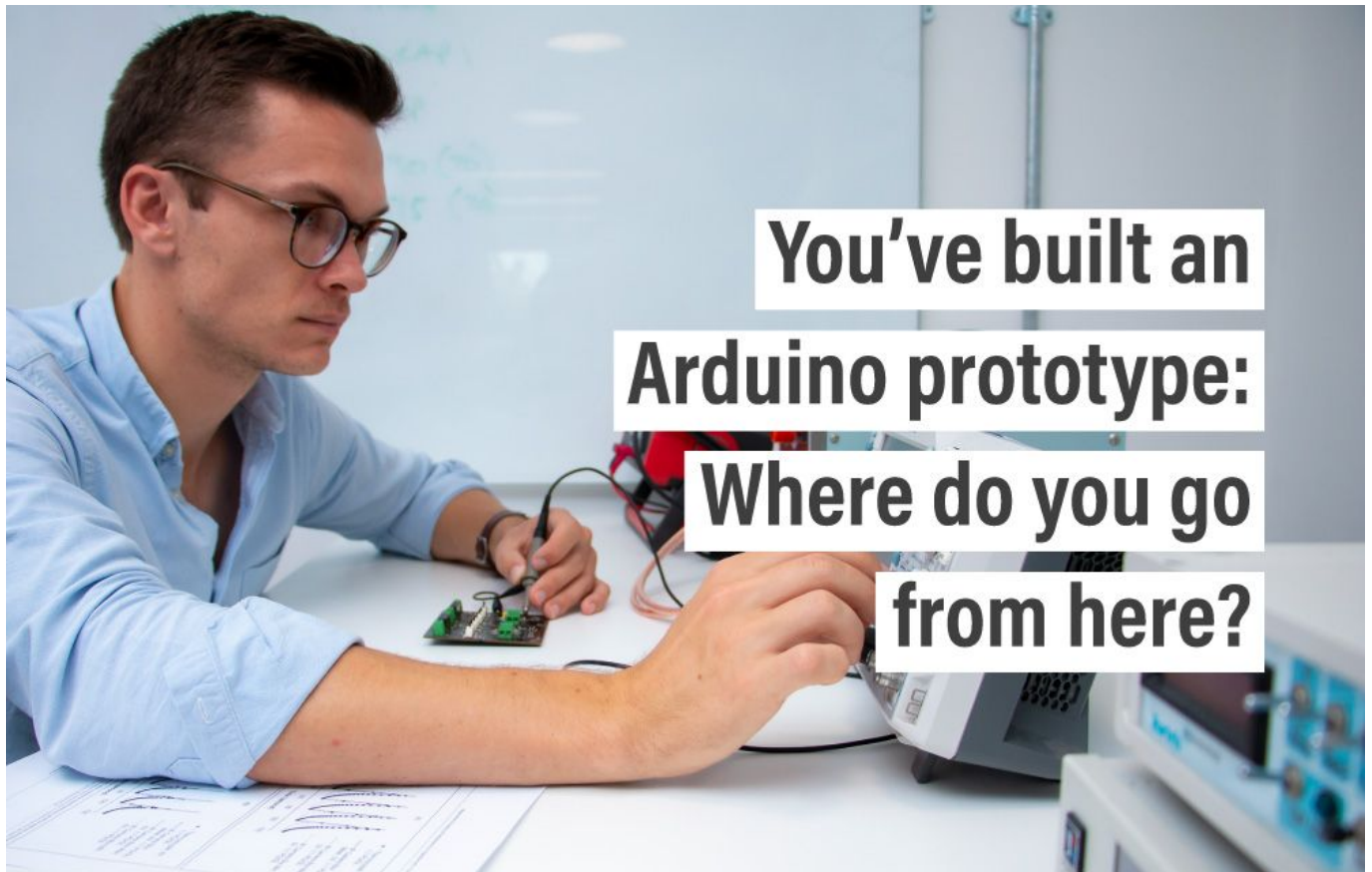


# You've built an Arduino prototype: Where do you go from here?



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# You've built an Arduino prototype: Where do you go from here?

Reading time 9 mins

## Key Points

- Arduino prototypes are like rough sketches that need refining
- Moving to integrated PCB designs can make products less expensive to manufacture and more efficient
- Gather schematics and lay out a new design
- Use free or low-cost PCB design software like Eagle or KiCAD
- Order fully assembled prototypes to reduce the risk of errors
- Test prototypes with code and make any necessary changes
- Order larger quantities once satisfied with the performance

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[Arduino](#) is a hugely popular, open-source electronics platform that includes hardware and software components designed to simplify the process of creating digital devices and interactive objects. The platform consists of a microcontroller board, various sensors, actuators and other components, and a programming environment allowing users to write, upload, and run code on the microcontroller board. Because it's easy to use for beginners and also flexible enough for advanced users, an Arduino prototype is often seen as an ideal starting point for bringing a product to market.

The platform was created at the [Interaction Design Institute Ivrea](#), Italy, as an easy tool for fast prototyping aimed at students without a background in programming or electronics. Now, it's widely used by hobbyists, students, and professionals worldwide for various applications, such as robotics, automation, and Internet of Things (IoT) projects.

## What is the Arduino platform used for?

When developing a new product, an Arduino prototype can be compared to a rough sketch that provides a basic idea of the final design. While it may not be as polished or refined as the final integrated PCB (printed circuit board) design, it's a quick and easy way to test ideas, validate them, and create a proof of concept. Just as painters can draw a sketch before starting the final art piece, device engineers can use an Arduino prototype to plan and refine their product before moving on to the more complex and integrated PCB design.

The Arduino platform is an excellent starting point for creating an electronic device. It's user-friendly, versatile, and provides access to various sensors, actuators, and other components. However, an Arduino prototype may not be the best solution if you want to create a production-ready product. In this article, we will explore the benefits of moving from an Arduino prototype to an integrated PCB design and the steps you can take to get there.

# Benefits of using an integrated PCB design for your final product

Once your prototype has been built, the next step is to create a minimum viable product (MVP): a fully functional product ready for sale with only the minimum/essential features included. You would use this to [find investors](#) and [test whether the product is user-centred](#) and fits your target market. In most cases, your final product design based on the MVP will require a custom approach which involves [designing a schematic from scratch and building a printed circuit board](#) (PCB) around that. The benefits of doing so include the following:

## 1. Cost Savings

While an Arduino prototype is an excellent starting point, scaling up to a production-ready device can be costly. An Arduino board, plus some shields and peripherals, can cost £100 or more. In contrast, an integrated PCB design can be a fraction of that cost. By designing a custom PCB, you can eliminate unnecessary components and simplify the manufacturing process, reducing the overall cost.

## 2. Manufacturing Efficiency

Arduino prototypes are often manually assembled and hand-soldered, making it challenging to achieve consistency and accuracy. In contrast, automated processes can manufacture and assemble integrated PCB designs with much higher repeatability and consistency. This makes it easier to scale production and improve manufacturing efficiency.

## 3. Smaller Size

Arduinos are designed to be versatile and universal, which means they will have a lot of features you may not use or need. A custom PCB design removes these unnecessary features and creates a smaller, more efficient device. This is especially important for making a portable or wearable device, where size and weight are critical factors.

## 4. Better Battery Life and Power Efficiency

Smaller boards with fewer wires, and no unnecessary features, mean that power efficiency is typically improved in integrated PCB designs. Fewer components require less power, resulting in better battery life, reduced power consumption and reduced heat generation.

## 5. Increased Security

If you use an Arduino and off-the-shelf shields and sensors, it's easy for anyone to copy your design. However, if you have a custom-integrated PCB design, it's much harder to reverse engineer. This can be especially important if you're developing a proprietary technology or product.

## Final thoughts on transitioning from Arduino to an integrated PCB design

Moving from an Arduino prototype to an integrated PCB design can bring many benefits. It can reduce cost, improve performance, and increase the reliability of your product. Anyone can make the transition with the right PCB design software and a clear understanding of the design process. By

following the steps outlined above, you can move from a proof-of-concept prototype to a fully functional and reliable product that can be mass-produced.

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