

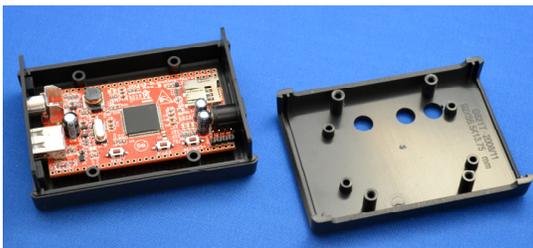
Five Tips for Quickly Developing a Cost Effective Non-Standard Enclosure

While enclosures do not rank high on the technology scale for complexity, they are often a significant challenge for the engineer. With an unlimited number of choices in standard products alone, developing the right enclosure that meets cost, function and aesthetics can be daunting. Add to this that the engineer may be an expert at the electronics and electronic components but will have much less experience in enclosure design. Since virtually all enclosures need to be modified before they can be used to allow for input and output, and that the enclosure can be the highest priced component in the final product, the recipe is set for major problems. However, by keeping in mind the following five tips, the selection process can be radically streamlined.

1. Do not wait until the product design is complete before beginning the enclosure search process. Too often, the enclosure is sought out late in the process when minor changes to the components become almost impossible, potentially leading to extensive production tooling and design costs for the box. In addition, some enclosures have built in features that can be utilized if they are considered early but will be ineffective if their location is not considered initially. Most of all, the search process can be extensive and last minute product selection efforts can lead to significant delays based on not only the process of choosing the right enclosure, but even the product lead time. Keep in mind that an enclosure is not a high tech item, but rather bent metal or molded plastic, all of which have significant lead times.



2. Try to work with a modified standard product rather than a total custom product. While this seems intuitive, it is often ignored in the rush to devise the perfect box. Enclosure manufacturers have thousands of enclosures already designed with key features such as board slots, mounting bosses, and pre-cut holes. All of this can take time to research and to sample and to align with your other components. Creating a new size or types of enclosure can involve significant expense including tooling or mold charges as well as adding to the lead time.



3. Try to avoid a third party (including your in-house services) doing the modifications. The manufacturer knows all of the information required to properly provide a turn-key product for their specific product. As an example, they understand the proper torque and drill types needed to avoid cracking or otherwise damaging the box, what types of modifications can be cleanly performed, and also appropriate tolerances. They are responsible for any quality problems, eliminating the costs and time of replacement products. For larger quantities, even more money can be saved as modifications can be included during production. There is also the savings of freight and risk of damage in avoiding the shipment of product from the manufacturer or distributor to you then to your modification source.



4. Use the manufacturer's drawings as the basis for your enclosure design. Most enclosure producers provide DXF drawings and even 3d models on their websites that can be rapidly downloaded. If not available online, be sure to request them from the manufacturer or their distributor. Taking advantage of these tools eliminates problems such as holes too close to bosses or edges, misaligned components, and simple structural errors. It also speeds the production process as many companies can use these drawings in their estimating process and in their production on automated equipment as well. It insures that you receive the product you desire and reduces quality challenges.



5. Be sure to acquire the product from a manufacturer or their distributor who has complete capabilities to create the final enclosure that you need. These services can range from rapid prototypes, design support, creation of cutouts, painting special colors and even silk screening. A good partner can provide you with special packaging to ease your component installation, scheduled deliveries and should be able to work with the buyer and engineer from prototype through production. Enclosures are not readily interchangeable from manufacturer to manufacturer due to different production methods, materials or tolerances. Developing a partnership allows for success not only on a current project, but on future endeavors as well.

For a simple product, the process of acquiring a modified enclosure can be quite complex. With some advanced preparation and by adhering to these five suggestions, the box can be quickly and successfully incorporated into the final product, resulting in a successful launch.