How it works

Although each project is different, all StdBx designs use a common architectural structure to fit into the enclosure. A cross section diagram of the structure shows how the parts work together.



The design starts with a PCB that has the user interface components (buttons, switches, displays, connectors, etc) mounted to it. In front of the PCB is the front panel that protects the PCB components and provides the surface for labels. There is a library of common components that the designer can choose from. Each component in the library was chosen so that it looks and works well with the structure. The PCB and the panel separated by threaded spacers and are captured and held in place by channels in the enclosure.

The front panel is designed as a sandwich of three layers.  I call these Epi, Reveal and Diffuser.  The top Epi layer is always clear with cutouts for controls or connectors that protrude through the panel.  The middle Reveal layer is opaque with cutouts for protrusions and labels.  The bottom Diffuser layer is translucent.  It has cutouts for protrusions and things like displays that should not be blurred.



Without backlight the Diffuser layer enhances the contrast of the cutouts in the Reveal layer.  With backlight the labels or indicators cut in the Reveal layer light up.  In terms of laser cut plastic there are actually just two pieces that are fastened together when mounted in the enclosure.  The Reveal layer is bonded to clear acrylic (i.e. 2-ply acrylic).  This is so that letter interiors don't fall away as part of the engraving process. When the Reveal layer is engraved away, it leaves the surface of the acrylic rough making it translucent rather than transparent so it can act as the Diffuser layer.

An alternative construction, that is more expensive but looks a little better, uses separate pieces of acrylic for the Reveal and Diffuser layers.



The parts in the library were carefully chosen so their heights, mounting and operation all fit with the spacing between the PCB and the front panel as well as the thickness of the front panel.