relative to the edge **306** of the circuit board **320** and located above surface-mounted LEDs **304** to capture light emitted by the LEDs **304** to project the light through the front panel **302**.

[0028] FIG. **3**B is a bottom view of a mechanical diagram of the circuit board assembly **300**. In an example embodiment of the invention, mounting features **303** of the light transmission elements **315** may be securely press-fitted into the circuit board **320**, as illustrated. In this example embodiment, the mounting features **303** can be secured into openings in the circuit board **320** and positioned behind SFP cage connector components **312** without the use of special tools or fixturing. Light-emitting ends **311** of the light transmission elements **315** extend to the front panel **302** of the circuit board assembly **300** and emit light indicating status of a circuit (not shown) to which the LEDs **304** are connected.

[0029] FIGS. **4**A-**1**, **4**A-**2** and **4**A-**3** are a series of mechanical diagrams providing different viewing angles of a light transmission element **400** according to an example embodiment of the invention. The light transmission element **400** includes (i.e., defines) three mounting features **403** to secure a light-receiving end **413** having light-receiving surface(s) **414** to receive light into the light transmission element **400**. The light-receiving end **413** may include a curved portion **412** to redirect light along a path other than its original direction. In this example embodiment, light travels along dual, parallel light propagation regions **418**. It should be noted that the curved portion **412** may also be defined herein to be within the light propagation regions **418**.

[0030] The parallel light propagation regions **418** may be a geometric structure and may be rectangular in shape or have another shape that can support propagation of light. Further, there may be a support **422** between the adjacent parallel geometric structures **419**. This example embodiment also includes a light-emitting end **425** with a textured surface **430**.

[0031] FIG. **4**B is a close-up view illustrating the example embodiment of FIGS. **4**A-**1**, **4**A-**2** and **4**A-**3**, including the light-emitting end **425** that may be defined by textured surface **430**. The surfaces **430** may be textured to better diffuse the light. The texturing may be accomplished either when the geometric shapes are cast or after the shape has been formed.

[0032] FIG. **5** is an optical ray trace diagram illustrating the movement (i.e., path) of light through a light transmission element **500** according to an example embodiment of the invention. Light **514** is generated by an optical light-generating device **502**, generically illustrated as a light bulb, but it should be understood that the device **502** may be any form of light-generating device, including a surface-mounted LED, for example. In this embodiment, mounting features **503** securely fasten a light-receiving end **513** in a position to receive the light **514** from the light-generating device **502**. After receiving the light **514** from the light-generating device **502**, the light-receiving end **513** may redirect a portion of the light along a curved portion **512**. In this example embodiment of the invention, the curvature and the angle of the rear reflecting surface **519** are configured such that the light strikes the surface at an angle larger than the critical angle, which results in total internal reflection **509** of the light **514** that entered the light transmission **500** via the light-receiving end **513**. The light internally reflects within the light propagation region **518** and exits via the light-emitting end **525**, unless caused to exit prior to reaching the end **525**, as redirected light **516**. The redirected light **516** may then be observed so that the state of an associated circuit (not shown) may be determined visually by an observer.

[0033] FIG. **6** is a flow diagram illustrating an example method (**601**) that begins with accepting light (**605**) projected by an optical light-generating device. Propagation (**610**) of the light may be supported for a given length in a direction other than the incident direction. The propagated light may then be outputted (**615**) such that, at the end (**620**) of the flow diagram **600**, a state of a circuit corresponding to the light-generating device is indicated visually to an observer.

[0034] FIG. **7** is a flow diagram **700** illustrating a method of manufacturing a circuit board according to an embodiment of the invention. The flow diagram **700** begins by attaching (**705**) the connector component to a circuit board at a first angle (other than perpendicular) relative to an edge of the circuit board. The connector component may be an SFP cage, for example. Next, a light-generating device is integrated (**710**) with the circuit board and a circuit on the circuit board to produce light as a function of a state of the circuit board. An optical light transmission element may then be mounted (**715**) in optical arrangement with the light generating device, at a second angle relative to the edge of the circuit board, so that light can be accepted by the optical light transmission element. In an example embodiment of the invention, a front panel may be attached to the circuit board with the connector component and optical light transmission element projecting there through at their respective first and second angles.

[0035] While this invention has been particularly shown and described with references to example embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the scope of the invention encompassed by the appended claims.

[0036] For example, any material or combination of materials of sufficient optical clarity that can support total internal reflection and the propagation of light may be used to compose optical light transmission elements by way of example herein. Although the geometric structure of the light propagating regions are generally illustrated as being square or rectangular, it should be understood that almost any shape may employed. In addition, the mounting features may be press-fit pins or other functionally equivalent components. For example, although the mounting may be press-fitted into holes in the circuit board, an adhesive material may also be used. Similarly, although three mounting features are illustrated in the embodiments above, additional mounting features may be utilized. The mounting features may be ribbed and cylindrical, but additional smooth shapes may also be utilized. Further, the inclination of the internal reflection surface and the shape of the curved portion may vary. The length of propagation may be shortened or lengthened. Injection molding may be used to produce the various embodiments above, but other manufacturing processes may be utilized.

What is claimed is:

1. An apparatus for providing optical indications about a state of a circuit on a circuit board, comprising:

a connector component coupled to a circuit board to accept a mating connector component at a mating location at a non-perpendicular first angle relative to an edge of the circuit board; and

an optical light transmission element, with at least three mounting features to couple the transmission element to the circuit board, the optical light transmission element, including: