



## APPLICATION NOTE: 209

**A**pplication: Inspection of Injection Molded Keyboard

**P**roblems:

- 1) Uniform Illumination over all Keys
- 2) Glare from Key Surfaces
- 3) Low Contrast Protrusion on Center Key



Phone Keypad



Center Key Detail

### **S**olution:

Automated assembly of a wide variety of buttons, knobs and keypads requires an inspection operation to check for a number of potential defects. These types of parts must be inspected for overall quality of the molded part, and normally are also inspected for the quality of the silk-screened or impregnated graphics. In the above application, to simplify the inspection algorithms, good uniformity is simultaneously required over all of the keys. The illumination scheme must also eliminate all glare from the front face of the keys. In this application it was also necessary for the lighting scheme to provide sufficient contrast for recognition of the protrusion present on the center key.

To solve this problem, a fiberoptic DRI system (U.S Pat. No. 5,752,767) was used to provide the high levels of uniformity required. The DRI device also eliminated glare from the front face of the keys which had caused the inspection algorithm to incorrectly interpret numerals. Another advantage of the DRI is that it eliminates the effects caused by ambient lighting which can cause erratic system behavior. The DRI lighting system is powered by a 3900 *Smart-Lite* which provides the output stability necessary to ensure that the algorithm remains robust and reliable. Together these lighting performance factors give the system a robust front end that guarantees long term system reliability in a production environment.

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