

**Integrated Biometrics'  
LES Technology  
VS  
Traditional  
Prism-Based Sensors**

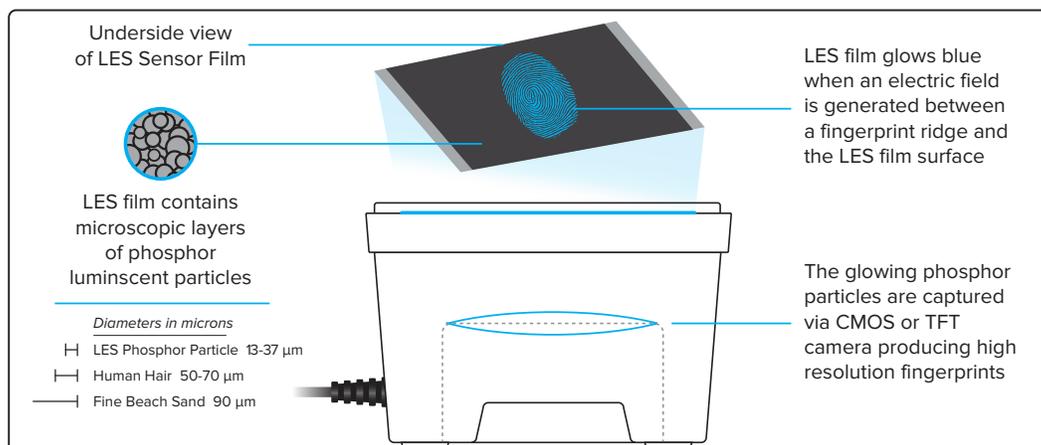
## IB's LES Technology vs Traditional Prism Based Sensors

Light Emitting Sensor (LES) technology is changing the biometric identity landscape. Based on the science of electroluminescence, LES devices generate fingerprint images by energizing particles of dielectric phosphor suspended in a thin film substrate. The resulting images are captured using proven digital photography optics.

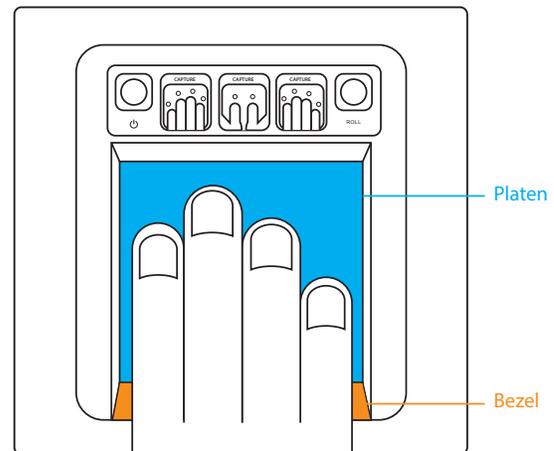
Integrated Biometrics (IB), a US-based company, and its subsidiaries have been perfecting the development of LES technology in fingerprint sensors for nearly 20 years. They are the first and only provider of FBI-certified optical fingerprint sensors based on LES technology. The sensor design, used in dozens of biometric manufacturers products around the world, offer Appendix F and PIV certified images in extremely low power consuming, lightweight, rugged devices and qualify as an optical sensor as required by most project specifications.

### How does LES technology work?

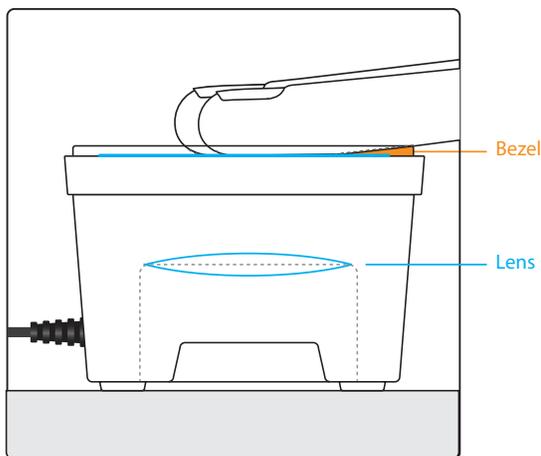
LES technology uses energy to excite phosphorus particles suspended across a thin film substrate. These electroluminescent particles glow via the conductive properties of a human finger to produce an image of the fingers ridges and valleys.



It takes only a small amount of energy, transferred using the conductive properties of a human finger across the sensor's bezel and platen, to excite the phosphor particles in the film. The result is an image so detailed that even the body's sweat pores are evident within the fingertip's ridges and valleys.



### Capture Optics



Images produced by LES film are captured via high speed digital camera optics. Depending on the imaging sensor type, either a CMOS camera and traditional glass lens or a thin film transistor (TFT) camera are used. Both options capture high quality images of the acquired fingerprint(s).

The resulting image file is then transferred using a USB interface to the host PC, tablet, or smartphone. In addition, this USB connection also acts as the sensor's power source. Separate power supplies are not required. The low power requirements of LES technology make these scanners ideal for smartphone and tablet applications, as these devices can operate for hours without auxiliary power.



### **Why is LES technology better than traditional prism-based scanners?**

While LES technology is optical, it does differ in positive ways from traditional technologies that employ a clear glass platen and prism. Traditional optical sensors only “see” the surface topography of the finger (or fake finger) presented on the glass. This technology is susceptible to image spoofing. LES sensors inherently guard against spoofing as they require the friction ridge of the finger to contact the film while simultaneously contacting the device’s bezel. The connection between LES film and bezel complete a circuit and create the fingerprint image. Without the conductivity properties of the human finger, fake fingers will not work. Additionally, the oils, latent prints, and dirt that are often left behind and ruin images on a traditional glass platen, are simply not “visible” when using the LES sensor. This simple difference between LES and prism-based sensors means no more cleaning the platen after every single use – LES technology excels in unattended applications.

The unique advantages of LES technology are extraordinary. IB's devices:

- FBI Appendix F certified imagery in multiple form factors
  - FAP 30
  - FAP 45
  - FAP 50
  - FAP 60
- Smaller and lighter weight than the competition by up to 90%
- Maintenance-free, low cost ownership
  - Self-calibrating
  - Does not require costly silicone pads
  - Expensive lotion for dry fingers not required
  - No internal light source to burn out
- Durable non-scratch platen
- Impervious to latent prints or oils on the platen
- Immune to “halo” effect when used in cold conditions
- Lowest power consumption in the industry
  - Powered via USB host
- Image quality is impervious to bright lights/sunlight
- Excels in image collection, even dry or dirty fingers
- Operates using a single SDK for all devices
  - Reduces engineering expenses
  - Common technology format across all form factors
- Ideal for mobile environments and field use