

Light Emitting Sensor (LES) scanners are an advanced form of optical scanners. They share many common features with traditional FTIR (Frustrated Total Internal Reflection) scanner; but offer significant advantages over legacy optical scanners.

Both LES and legacy optical scanners create grayscale images of a fingerprint using images captured by a CMOS/CCD camera that are suitable for ANSI/NIST Type-14 records. But how that image is captured differs greatly.

### LES: Optical Scanning Without a Prism

A LES optical scanner does not require an internal light source or a glass prism. A multilayer electroluminescent film emits light at points where fingerprint ridges make contact with the film, thus completing a low-level electric circuit. LES actively illuminates the ridge itself, creating a higher-fidelity signal that is immune to ambient light interference. A camera captures the emitted light. Ridges appear bright relative to valleys (contrast is inverted vs. FTIR).

### LES: Advantages over FTIR

LES scanners offer numerous advantages while retaining the benefits of optical scanning.

- **Size:** Without a bulky glass prism, LES scanners are smaller, thinner and lighter than FTIR scanners

- **Durability:** Great care must be taken to protect the prism and the clear glass platen in FTIR scanners from breakage, LES scanners are more durable and rugged
- **Scanning Errors:** FTIR scanners fail to capture accurate prints if oils, dirt or latent fingerprints are present; requiring constant cleaning of the platen. Such contaminants are not 'visible' to LES scanners as they do not trigger the electroluminescent film
- **Power:** LES scanners utilize less power than FTIR scanners; a huge advantage for mobile deployments
- **Anti-Spoofing:** FTIR scanners only "see" the surface topography of the finger (or fake finger) presented on the glass. 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 to capture an image. Without the electrical conductivity properties of the human finger, fake fingers will not work.

Light Emitting Sensor (LES) technology delivers all the advantages of optical fingerprint scanning while overcoming many of the limitations of traditional FTIR systems. By eliminating the prism and actively illuminating fingerprint ridges, LES scanners are smaller, more durable, more power-efficient, resistant to contamination, and inherently better protected against spoofing, making them ideal for both fixed and mobile biometric applications.

