

iGuard Application Note: Fingerprint Enrollment

Fingerprint Enrollment is to register the fingerprint template for later recognition. A good enrollment is crucial for all reliable fingerprint recognition systems, including iGuard. Here are some general factors that may influence the enrollment:

- ◆ **Finger Position.** Place the center of finger in the middle the sensor. The fingerprint may be positioned far left, far right, far up or far down. For instance, if a user enrolled a far left fingerprint. During verification, the user may press far right. Since there is no overlap between enrollment and verification templates, the user may be rejected incorrectly. If the user enrolls the finger in the middle, there is a better chance of being accepted.
- ◆ **Finger area.** The best advice is to cover the sensor area completely with finger to ensure the maximum fingerprint surface contact area. A common mistake is to touch the sensor with the tip of the finger, which contains too few information (ie., minutiae). It is also preferable to use the thumbs rather than other fingers.
- ◆ **Finger rotation.** It will be good for the user to keep the fingerprint rotation minimal during the enrollment. The rotation should be within +/-10 degrees during enrollment.
- ◆ **Finger condition, very dry or wet finger.** Although iGuard's fingerprint sensor is designed to handle dry or wet finger conditions, it is wise to handle specially of very dry or wet fingers. The user can wipe their wet fingers with cloth or paper towel. For dry finger, the user can moisturize the finger by breathing on it, by touching the forehead to pick up surface oil, or by applying small amount of skin-moisturizing lotion. The image quality could be improved tremendously by taking care of the dry/wet condition during enrollment.

It is important that the user stores a high quality image when enrolling a fingerprint, because this is the fingerprint that the user will be compared with in all the verifications afterwards. If the users enrolled fingerprint image is of low quality, the user may get unexpected results during the verification stage.

Please note that during the less critical verification stage, the fingerprint image does not have to be perfect. The only requirement is to obtain enough unique "information" (ie., minutiae) to match the fingerprint. Therefore, the above steps are usually necessary for the enrollment stage only.

- ◆ **Finger pressure.** Use medium pressure. Excessive pressure may distort the image and adhere ridges together. Too little pressure would lead to a small fingerprint area or dry fingerprint.