

## What is Hand Geometry?

### Hand Geometry is a type of Biometric technology.

- *Biometrics* are automated methods of identifying (or verifying the identity) of an individual using a physical characteristic or behavioral trait.



- *Biometrics* may measure:
  - Things you do, such as speech and handwriting
  - Things you *are*, for example
    - Hand Geometry
    - Fingerprint
    - Facial Geometry
    - Eye: characteristics of the iris or retina

### Hand Geometry has been in use longer than any other biometric

- Two-dimensional hand geometry device in 1970's
- Uses 3-dimensional hand geometry
- Over 100,000 units installed
- Major Applications include Time and Attendance and Access Control

### How it works

- Measures unique size and shape of the fingers and hand
- Over 90 distinct measurements are made by Length, Width, Thickness, and Surface Area

### When the hand is placed for verification:

- Low-level infrared light source ensures crisp, clear image
- CCD camera records 3D image of the hand
- Algorithm converts this image to a mathematical value
- This value is compared with the hand template stored in memory
- If the two match, identity is confirmed (the punch is recorded)

### The template is updated with each successful verification – “it learns your hand”

- Allows for changes due to weight gain or loss, aging, etc.
- Eliminates need to re-enroll users.

## Why HandPunch?

- Badge-based terminals eliminate many of the problems associated with manual time and attendance systems. But there's one issue that remains: "**Buddy Punching**", the practice of employees clocking in other employees who are not at work. HandPunch HandReaders stop buddy punching because, unlike badges and cards, the hand can't be lost, stolen, or loaned to another person.
- HandPunch uses a field-proven technology called hand geometry, which verifies an individual's identity based on the size and shape of the hand. It does not take fingerprints or handprints.
- HandPunch is the most popular biometric terminal for time and attendance.
- If your company wants to use badges, HandPunch can accept input from most bar code or magnetic stripe badges, even proximity cards. HandPunch 4000 has a built-in bar code reader.
- Users have found that HandPunch readers can pay for themselves in as little as 3 months.
- HandPunch has been around since 1986. Customers need not be concerned about purchasing unproven technology from a startup company that might not stay in business
- Over 100,000 HandReaders are currently in use throughout the world.
- The price difference between HandPunch and badge readers is not as great as you might think.
- HandPunch can be used in any type of work environment, from fast-food restaurants to construction sites.

## HandPunch stories

- A 600-employee company reported that before installing HandPunches, they were losing 5 to 10% of their total payroll cost to buddy punching
- A restaurant that installed HandPunches found that overtime cost were reduced by approximately 300 hours per pay period
- When an 8,000-employee hospital made the switch from badge-based terminals, they reported that the HandPunches paid for themselves in only three months.

## Rings and Fingernails

- Jewelry may be worn
- Be consistent in the use of jewelry
- Stones should face upwards
- Long fingernails & false fingernails should have no adverse effects

## Important Error Rates

- False Accept Rate (FAR): Rate at which an imposter is accepted by the biometric system
- False Reject Rate (FRR): Rate at which an enrolled user is rejected by the system
- *HandPunch error rates:*
  - False Accept Rate – 0.1%
  - False Reject Rate – 0.1%

## Why is the False Reject Rate critical? An example:

- A company has 100 employees. Each person "punches" 4 times per day  
That's 400 transactions per day, 2000 per week.  
A 1% error rate means there could be as many as 20 problems per week.  
Our error rate of 0.1% means only 2 potential problems per week
- Each False Reject means that someone will have to spend time making manual adjustments, and troubleshooting the problem
- A high false reject will frustrate users and give them an excuse for not punching!!

## Verification vs. Identification

- Verification: Enter ID number, then present biometric (hand, finger, face, etc.) for comparison with stored template.
- Identification: Present biometric: database is searched for your template.
- Most biometric devices – including HandPunch – do verification only.
- Identification
  - Some biometric vendors claim to do identification
  - Has been successful only with small databases
  - Can be slow, requires powerful CPU to search database

## HandPunch Frequently Asked Questions

Q: How many hand templates can be stored?

A: Up to 32,512 depending on the model. HandPunch 1000 is set for 50 users and can be upgraded to 512

Q: What is the template size?

A: 9 bytes. This is important because other biometrics have much larger templates, so they can't handle as many users with a single device.

Q: Do rings or band-aids have an effect?

A: Not usually enough to reject a valid user. Just make sure the ring is in the upright position.

Q: What happens if I injure my hand and have it bandaged?

A: You can be enrolled with your left hand, palm up while the right hand is disabled.

Q: I have a card system and want to upgrade to add a biometric solution. Is this a problem?

A: No it's easily done.

Q: How many digits can I use for an ID?

A: Up to 10

Q: Can you interface to commonly used access control systems?

A: Yes, the HandPunch architecture allows us to interface to most commonly used access control systems. We just need to know the format required.

Q: How is your throughput: we have a lot of people go through?

A: Typically the verification is less than 2 seconds. As people use the HandPunch they process faster. Typically, a HandPunch will process 15+ people per minute

Q: Are there any privacy issues?

A: Hand geometry technology cannot be reverse-engineered to identify people. It does not store the image of the hand, but stores the template which is a mathematical representation of the hand image. This mathematical value is meaningless to other devices.

Q: Is the HandPunch safe?

A: The infrared lights used in the hand reader are similar to those used in remote controls for TV's and VCRs. No reports of hazard have been generated by OSHA.

## General tips

- Competitors may make extravagant claims regarding their False Accept and False Reject Rates. Don't believe them! Our error rates have been proven in the field.
- There are over 100,000 HandReaders installed.