



Secure Access
at the Speed of Life

*IMID*TM

In Motion Identification

White Paper

Authorized Customer Use

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IMID™ Access Overview

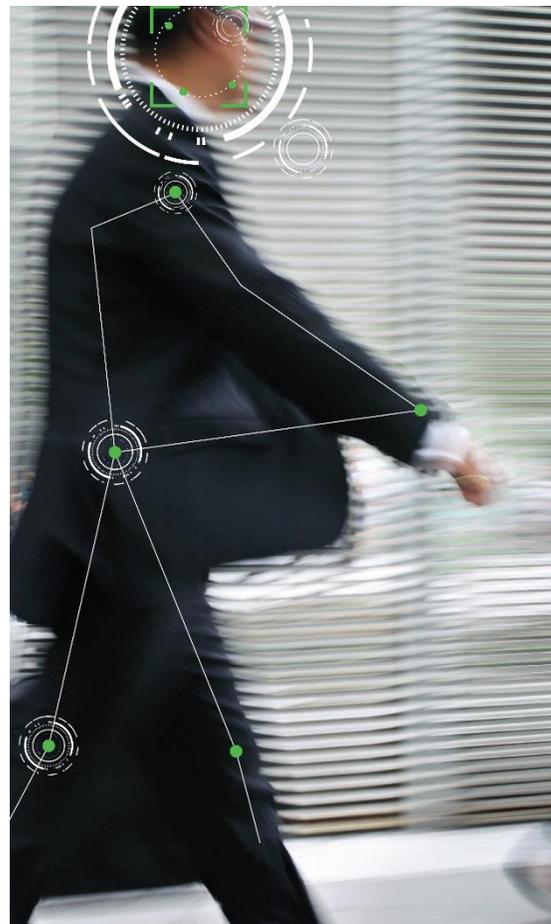
In today's world of technology and urbanization, access to people, places and information has never been easier. Today, ensuring secure access to restricted or private areas has taken on renewed importance. FST Biometrics' primary secure access solution, IMID Access, provides a seamless, accurate and non-invasive user experience with its *In Motion Identification™* technology. This, coupled with its strong protection of the privacy of data, makes it an ideal platform for those contemplating a biometric identification system.

Using a unique fusion of biometric identification technology, including facial recognition and behavior analytics, IMID Access identifies authorized users from a distance and in motion. There is no slowing down to take out a key card or present ID. Authorized users are granted access seamlessly, while unauthorized are prevented from entering.

IMID Access with *In Motion Identification™* provides a non-invasive and seamless user experience, while maintaining quick and highly accurate biometric identification.

Users do not need to interact with the sensors or cameras. Rather, a simple glance in the general direction of the camera as they are walking toward the access point will provide the necessary information to grant secure access to authorized users.

To complete the secure access process, the system provides both audio and visual feedback to the user. There is no privacy-sensitive data such as finger prints or iris scans. Rather, IMID Access's biometric technology provides *In Motion Identification™* using standard IP video cameras, making IMID Access easily integrated into many existing infrastructures.





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A Fusion of Technologies

IMID Access is a comprehensive secure access solution that facilitates identity management and access control. IMID Access represents a best-in-breed fusion of cutting-edge technologies, including 2nd generation biometrics, voice & video analytics:

1. **Face Recognition** is a non-intrusive and intuitive method of automatically identifying a person based on a digital video image. IMID Access uses facial characteristics and measurements that are unique to an individual in order to identify them as they approach.
2. **Behavioral Biometrics** consists of sophisticated video analytics algorithms and machine cognitive learning in order to detect the walking characteristics, body size & density and typical behavior.
3. **Video Analytics** allow the system to count the number of people at the access point, including tailgating and loitering detection.
4. **Speaker Recognition** validates a person's identity on the basis of distinct voice characteristics.
5. **License Plate Recognition (LPR)** uses image recognition software algorithms that automatically detect and read a vehicle's license plate number to provide parking lot access to authorized vehicles. LPR and recognition technologies cross-reference the license plate number with a database of authorized drivers.
6. **RFID** provides the ability to read all available RFID card formats and standards, as stand-alone for low security access points and in fusion with the biometric identification for very high security access points.



High Accuracy



Fast and Efficient



Non-Invasive



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The In Motion Identification™ Challenge

The challenge with *In Motion Identification™* is identifying a variety of people of different heights coming from different directions, all in motion. The identification needs to be performed in an area and in a single spot. The area needs to be a minimum of 6x6x6 feet (approx. 2x2x2 meters).

To achieve a focused, high quality picture of people in motion, there must be constant and sufficient light on the identified person, particularly on his/her face throughout the entire recognition area. As the recognition is performed in motion and simultaneously as the identified person is walking in the direction of the access point, the identified person needs to keep their eyes in the direction of the access point, so the camera needs to be located at close proximity to the access point.

Because the identification is performed in an open area, there is no limitation on the number of people that walk together in the direction of the access point. The identification needs to be performed on all the people who are walking simultaneously in the direction of the access point via the recognition area. The estimation is that up to eight people will be recognized at the same time and in motion.

In comparison to standard face recognition systems that require the identified person to be standing at a specific point, fitting their face to the identification area and standing still until identified, our *In Motion Identification™* only requires that the light on the face be sufficient in the recognition area. Individuals and groups do not need to stop at any specific recognition spot.

To achieve high accuracy recognition, a minimum resolution of 50 pixels per inch (20 pixels per centimeter) on the people in the recognition area is needed.

Face locating and tracking algorithms are used to locate the people's faces and location within the streaming video. The processing time challenge increases when there is a need to analyze video streams from multiple cameras streaming multiple frames per second from all cameras.



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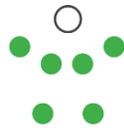
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The Basics of the FST Biometrics Solution

- It uses standard IP cameras with resolutions between 3Mpixel to 5Mpixel, transmitting M-JPEG compressed images to the server while running all processing procedures on the main server.
- Minimum lighting conditions must enable shutter speeds of 1/125 second or higher (200LUX average).
- There is an immediate visible feedback option next to the camera for interfacing the user and for attracting his/her attention in the direction of the camera.
- Setting up a server with sufficient processing power running Linux OS and the IMID Access software.
- Selected and installed hardware must be based on FST Biometrics' approved hardware list and in accordance with FST Biometrics' specifications and instructions.



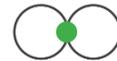
Seamless
Identification



Seamless
Access



Seamless
Technology



Seamless
Integration



Face Recognition Accuracy

In any biometric technology, False Accept Rate (FAR) can never be isolated without considering the corresponding False Rejection Rate (FRR). FST Biometrics created a patented fusion function that incorporates recognition information from vertical biometric algorithms thereby creating a system that provides very low false accept rate and at the same time maintains a low false reject rate.

These two figures show the performance of the FST Biometrics Face Recognition in two scenarios 1:N and 1:1.

Figure A:
The 1:N recognition ratio



The graph indicates the ratio between the percentages of false reject (no-detection) to false accept (false detection) rates. The percentages of false accept are three cases out of 10,000 (3/10,000) when the false reject are at two cases out of 1,000 (2/1,000). When higher security is set and the percentages of false accept are one case out of 10,000 (1/10,000), the false reject rate will provide 15 cases out of 1,000 (15/1,000).

Figure B:
The 1:1 recognition ratio



The graph indicates the ratio between the percentages of false reject (no-detection) to false accept (false detection) rates. The percentages of false accept are five cases out of 1,000,000 (5/1,000,000) when the false reject are at two cases out of 1,000 (2/1,000). When higher security is set and the percentages of false accept are two cases out of 1,000,000 (2/1,000,000) the false reject rate will provide 28 cases out of 1,000 (28/1,000).



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Analysis Basis

Below is a statistical analysis of false rejects and false accepts in an IMID Access secure access system from FST Biometrics. The analysis was done by collecting statistical information from multiple systems working in real conditions, mainly in the U.S.

8540 people* participated in the sample divided to:

Gender:	53 %	Female
	47 %	Male
Age:	8 %	6 -18
	33 %	19-35
	38 %	36 - 60
	21 %	61+
Ethnical Origin:	6%	Asian
	16 %	Afro American
	78 %	Caucasian

* On average, each participant was identified 10 times in the sample data.

General Conditions of System Operation

- Identify minimum resolution 100 pixels between the eyes
- The lighting level in the identification of more than 200 LUX
- All identifications were provided with a light-controlled interior
- Enrollment is performed only through the filtration system of FST Biometrics
- Minimum resolution between the eyes for enrolment is 150 pixels
- Lighting level for enrolment is higher than 500 LUX



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Advantages over RFID Card Based System

In low security access points, the RFID card based system could be sufficient. However, with an RFID card alone, the RFID reader identifies only the card itself, rather than the holder of the card. As such, an unauthorized person who obtains a card could enter, and there is the additional possibility of duplicating or creating fraudulent cards. With an RFID system alone, there can also be a possibility of slowing down to swipe a card, and there is no chance of duplicated or fraudulent cards. IMID Access eliminates the hindrances and challenges that exist when using only an RFID card based system. There is no slowing down to swipe a card, and there is no chance of duplicated or fraudulent cards. Authorized users are identified as they walk through using our unique fusion of biometric identification technology.

In addition, the IMID Access system has a full visitor management system, with two-way audio to the host's cellular phone, IVR for remote control from any cellular phone, and a real-time text notification system.

IMID Access with *In Motion Identification*TM seamlessly and accurately identifies authorized users allowing for secure access. There is no slowing down or stopping. Users simply walk through as we provide ultimate security at the speed of life.

