



# BIOMETRIC SYSTEMS



Hardware and Software Solutions for Access Control and Time & Attendance Applications



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# ABOUT US

BioSmart s.r.o. was formed with a focus on electronics and software development. The solutions we develop for the biometric market are designed to operate in large distributed systems with multiple locations and significant number of employees as well as in small systems. With the target of being fast, accurate, biometric. Applications include time & attendance and access control.

Robustness in the look of the devices makes them a great fit for the factories, warehouses, restaurants, retail chains, banks.

## WHY CHOOSE BIOMETRIC SOLUTIONS FROM BioSmart s.r.o.?

- Hardware and software come from one company — **integrated approach**
- Fingerprint or palm vein recognition technologies — **optimal choice of biometrics**
- Third-party extension capabilities — **open for integration**
- Solutions developed with network support in mind — **IP-enabled**
- Devices continue operation when network is not available — **fail-safe**

## Manufacturing

Our production capabilities allow us to deliver constantly quality products at almost any scale. Within the company we manage the full product cycle, from product design and development to the production and final assembly with quality testing. A product that is made in EU.

Extensive testing of each device allows us to provide a 3-year warranty.



# ACCESS CONTROL

The BioSmart IP-based access control system is a complete solution, offering you a range of biometric devices (readers and terminals) that can be installed outside the secure area, a ZFlex Relay Module to operate locks and turnstiles for access control to secured areas, and centralized management software to manage the system. Our systems provide your organization with efficient, reliable and cost effective access control solutions.

With BioSmart, it is possible to create solutions of any size — from local entrance monitoring (for one door) to networked access control for large-scale enterprises with geographically dispersed facilities. The devices can operate in standalone mode, including local enrollment. In the case of failed network connections, the operator is alerted to raise security checks. In the meanwhile, all access events are stored on the device and synchronized to the server once network connection has been restored.

The BioSmart system provides you with all the tools necessary for flexible management of security levels and allows you to choose the most appropriate identification method for each purpose. Available technologies include fingerprint and palm vein recognition, as well as the most popular smart card formats.

## Advantages

- World-class biometric technologies based on fingerprint and on palm vein recognition
- IP-enabled by design
- Extra layer of security with ZFlex Relay Modules
- Integration with the pre-existing access control devices via Wiegand interface
- Support of alarm systems and CCTV cameras
- 3-year warranty on hardware devices

## Major Functions

- Identification by fingerprints, palm veins, smart cards
- Control of door locks, strikes, turnstiles via relay modules in secure areas
- Anti-passback, escort, man trap (gateway), 2-man rule modes
- Various authentication modes – biometric, biometric + card, biometric + PIN
- Ability to specify time-restricted access permissions
- Access zones support to restrict access of employees to certain areas
- Access schedules
- Tamper detection
- Complete event logging
- Live monitoring of access events
- Alarms and CCTV integration





# TIME AND ATTENDANCE

Effective monitoring of employee attendance is crucial for a modern company in order to reduce late arrivals, early departures and unauthorized absences. BioSmart biometric systems offer an efficient solution and are equipped with features that can help your organization:

- Reduce payroll processing cost through automated labor data collection
- Eliminate «buddy-punching»
- Analyze and control time related data to have better control
- Flexibly monitor multiple locations

Fingerprint, palm vein pattern, iris pattern and other biometric characteristics are distinctive to individuals. Unlike smart cards or electronic permits they can't be lost, forgotten at home or passed onto a colleague. BioSmart biometric systems monitor attendance precisely and accurately, because the technology identifies employees rather than their cards or electronic permits. Following successful identification, information about authentication events is logged electronically.

## Advantages

- World-class biometric technologies based on fingerprint and on palm vein identification
- Web-based interface for the software
- Integration with SAP ERP HCM, Axapta, Atoss
- Customization of the software to add functionality tailored to your needs
- 3-year warranty on hardware devices

## Major Functions

- Individual reporting by each employee
- Wide choice of report types including time worked, late arrivals, early departures, leaves and current presence at workplaces
- Automatic reporting by e-mail or SMS (Twilio, Clickatell)
- Customized report creation with the Report Designer module

# INDUSTRIES



Palm vein recognition is a biometric identification technique with potential applications in a wide range of industries in which identity recognition is desirable. The following list provides industry-specific applications of how BioSmart functionality can be utilized in a variety of different sectors:

## Retail

- Confirming sales transactions
- Monitoring attendance of employees, including temporary workers
- Enabling access to restricted areas for authorized personnel only
- Enabling access to protected areas (server rooms, warehouses, etc.) for authorized personnel only
- Controlling personnel movement around company premises
- Monitoring attendance of employees
- Restricting access to confidential information

## Data Centers

- Enabling access to protected areas (server rooms, warehouses, etc.) for authorized personnel only
- Controlling personnel movement around company premises
- Monitoring attendance of employees
- Restricting access to confidential information

## Education

- Controlling access to facilities
- Restricting access to employee-only areas, computer rooms, laboratories and staff rooms
- Informing parents of students' arrivals/departures via text messages
- Organizing access to students' personal data
- Automated attendance taking

- Restricting vaults access only for authorized personnel
- Authenticating card users for ATM transactions
- Automating deposit boxes
- Restricting access to selected areas by permission for the employees

## Transportation

### Services for passengers

- Frequent traveler identification
- Restricting access to certain areas for registered passengers
- Automated deposit boxes

### Services for employees

- Enabling access to protected areas to personnel only
- Controlling personnel movement around company premises
- Monitoring attendance of employees
- Restricting access to confidential information

## Healthcare

- Restricting access to rooms with restricted drugs to authorized personnel
- Tracking attendance and movement of patients
- Monitoring electronic document flow and control of drugs sortage
- Monitoring employee attendance
- Setting up access control systems for confidential information (GDPR Ready)

# SMALL BUSINESS SUITE

For small- and medium-sized companies seeking an affordable yet reliable solution, we have created a special small business suite consisting of a biometric terminal with fingerprint or palm vein identification and BioSmart Studio v5 Light software, which can support up to 50 users and 2 terminals. This is a simple and powerful solution that can be

installed in a matter of hours. The only price you have to bear is for the hardware that you choose.

**The suite consists of the following components:**

- Biometric terminal
  - PV-WTC, palm vein terminal
  - WTC2, fingerprint terminal
- BioSmart Studio v5 Light version
- ZFlex Relay Module (optional for extra security)
- Desktop reader (optional for local enrollment)

System setup is simple and straightforward. It requires connecting the terminals to your local Ethernet network after mounting them, entering addresses for the devices, installing the software on the administrator's PC, and adding the devices. Once you're up and running, you can easily adapt the system to your corporate structure, enrolling new employees and sending information about them to the devices.





# PALM VEIN IDENTIFICATION

Palm vein identification is something someone has probably heard about but not often experienced. It is a technology developed in Japan, which is widely used there. It provides high security (up to one million reference points) together with the highest accuracy that a biometric technology can offer. The sensor uses a 850 nm and 940 nm long near-infrared waves, detecting low levels of oxygen vein blood and distinguishing it from living tissue. It is then transformed into a pattern which describes veins inside a person's palm. The pattern is converted into a template — this is a mathematical model. The template gets encrypted and stored into a database and is matched with what is already stored for proper identification.

Palm vein patterns are unique to each person and research has shown that these patterns remain unchanged as an individual ages. Palm vein patterns are more complex when compared to fingerprints or the finger vein patterns and have more unique features on which to base matches. This allows for the construction of extremely precise digital models, which can be used for the identification of users whose patterns are collected in large databases. The inner side of the hand is used for identification since it is less prone to changes in skin color than the outside, since it receives less exposure to the sun.

The main advantage of this technology is that it provides a non-intrusive mode of identification. High technology reliability has been achieved with low FAR levels (~0.00008 %) and research has confirmed results using databases containing up to 150 thousand palms. Other identification technologies, for example fingerprints, encounter issues with reading dirty or wet fingers, due to seasonal changes in the papillary diagram, cuts, etc. On average, 5-8 % of the people have fingers that are difficult to read using fingerprint identification technologies. The success of palm vein identification, however, is not dependent on whether the hands being scanned are dirty, wet, or have surface variations. In addition, this technique is both non-invasive and hygienic.

## Principle of the Method

The method is based on the principle of reading emissions of the reflection of person's hand in the near-infrared spectrum, at a wavelength of 760 nm. Since recovered hemoglobin in the blood absorbs infrared light, the venous vessels have emissions of lower intensity. As a result, a unique diagram is formed and can be elaborated with a mathematical method with the output written into a template. Next, the template is compared to a sample in the template database (in the case of 1: N identification)

or is compared in pairs (in the 1:1 verification mode).

## Steps of Creating a Biometric Template

1. Filtration of the raw graphic image — this process selects important areas of the palm and reduces distracting noise and highlights.
2. Binarization — brings all of the images to a common view and reduces the impact of different focus lengths and image contrast.
3. Selection of the scan area — finds «membranes» between fingers.
4. Splitting of the obtained image into discrete areas with the coordinates of the control points and curve angles and further saving these points into the file, which represents a mathematical model of the points recorded. This also makes it impossible to reverse generate the original palm vein image from the template.

## Identification

- The process is based on comparing a scanned template with a template

previously saved to the database.

- This comparison relies on a correlation mechanism that carries the major processor load for the calculation system.
- Identification speed can be increased by employing a pre-selection mechanism that uses general details of the manner in which the venous image is built (hash code).

## Advantages of Palm Vein Identification Technology

- The technology is extremely accurate and secure
- Forging is next to impossible
- It is a non-intrusive method
- Identity can be verified whether palms are wet or dry
- Well-suited for dry climates and people of any age

# BIOSMART PV-WTC TERMINAL



The BioSmart PV-WTC terminal is an IP-enabled multilingual terminal for use in time attendance and access control solutions, delivering the advantages of palm vein identification technology. Palm vein diagrams offer greater uniqueness when compared to other biometric features, providing higher levels of security. The large scanning area means that the system's sensor can recognize palm vein images whether the hands scanned are dirty, wet, or scarred. It supports identification of up to 300K users in palm + card or palm + PIN modes.

The terminal is used across the companies in logistics, retail, banking industries. As well as in restaurant chains and in data centers.

## Highlights

- Solidly built housing with IP65 ingress protection
- TCP/IP-based with support of pure standalone mode (local enrolment)
- SSL encrypted connection to the management software
- Integrated RFID card reader, with support of template on card
- Extendable functionality via upgrades

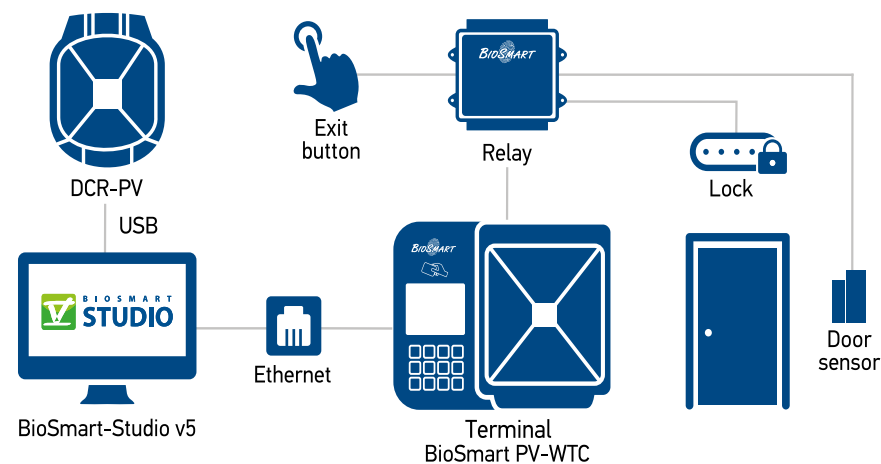
## Access Control Functionality

- Single or multi-factor authentication (palm only, card only, palm + card, palm + PIN)
- Secure door strike/lock, PTE buttons, alarms connection via ZFlex Relay Module
- 2-Man rule (2 authorized employees are required to grant access)
- Escort mode (1 authorized employee and a visitor)
- Duress palms (silent alarm in case of a forced entry)
- Access zones (restrict access of employees to certain areas)
- Anti-passback (no entry is allowed if employee did not leave premises first)
- Tamper detection (sensor + switch)

## Technical Specifications

Authentication types	Palm or card Card + palm PIN + palm Palm and smartcard
Type of scanner	Multispectral infrared lights
Users, card + palm or PIN + palm	Up to 300 000
Match time (1:1000) in local mode, by palms	< 2 sec
Users, palm in server mode	10 000
Identification time in server mode, 1:1000	< 2 sec
Event log capacity	1 million
Access schedules	250
Template size	1 k
FAR (False Acceptance Rate)**	0,00006 %
Smart card reader	MIFARE Classic®/MIFARE® DESFire® EV1 (13.56 MHz) HID Prox/iClass/iClass SE (125 kHz / 13.56 MHz) Legic Advant (13.56 MHz) Em Marine (125 kHz)
Keypad	Touch, 12 buttons, programmatic function buttons
Audio	Speaker and multi-tone buzzer
Communication	Ethernet (10/100 BASE-T), RS485 via a converter

Bluetooth	Enabled
ZFlex Relay Module support	Yes, for extra layer of security
Wiegand I/O	Output, 26/32 bits
PTE button inputs / door sensor inputs	1
Door strike relay	12V, 1A
Tamper detection	1 sensor on case opening 1 switch on removing device from wall
Power requirements	12V±15%, 1A
PoE (Power over Ethernet)	Optional, IEEE 802.3af
Operating temperature	-20 ... +50°C (32 ... 122 °F)
Ingress protection	IP65
Dimensions (H x W x D)	220x155x140 (8,66x6,1x4.61)
Weight	820 g (29 oz)
Regulatory approvals	CE, FCC, RoHS2
Warranty	3 years



# BIOSMART PV-WM READER



The BioSmart PV-WM is a wall-mounted reader designed as an affordable yet powerful installation with palm vein identification support. The device operates via a UniPass controller (see p.19), that can support two devices. This feature, as well as the lack of a screen and keyboard on the reader, allow for a reduced overall cost in installation when several readers are necessary.

## Highlights

- Compact design
- The most affordable palm vein solution
- Extreme accuracy and secure identification
- Forging is next to impossible
- Method is non-invasive and works with almost any person of any age
- IP correction

## Technology

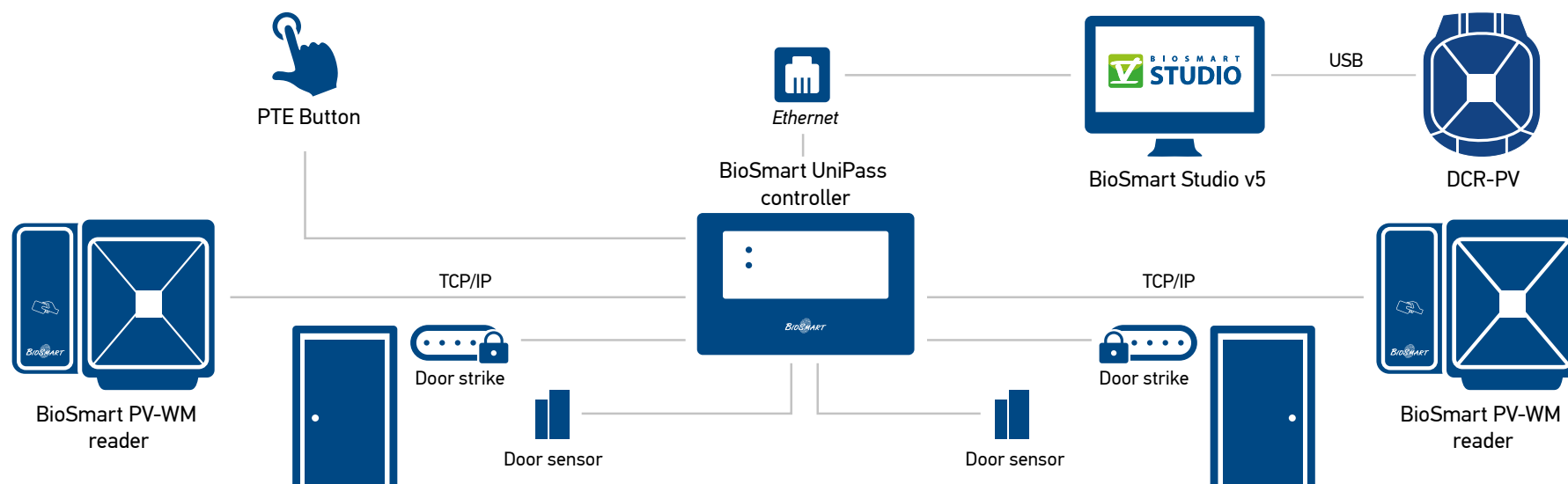
Operation of BioSmart PV-WM reader is based on the technique of palm image generation in IR light of a certain wave length. Blood depleted of oxygen possesses a larger IR radiation absorption factor as compared to the living tissue of a palm. Thanks to this effect, veins hidden under cutaneous tissue become visible when scanned in IR range of the spectrum. Produced vein pattern is unique for each person, and the system uses it for further identification.



## Technical Specifications

Authentication types	Palm or card Card + palm
Type of scanner	Multispectral infrared lights
Smart card reader	MIFARE Classic®/MIFARE® DESFire® EV1 (13.56 MHz) HID Prox/iClass/iClass SE (125 kHz / 13.56 MHz)
LED indication	Tri-color (blue, red, green)
Audio	Multi-tone buzzer
Communication	USB 2.0, up to 5 m (16,40 ft), Ethernet (100BASE-T)
Controller type	UniPass
Tamper detection	1 switch on removing device from wall
PoE (Power over Ethernet)	IEEE 802.3af
Power requirements	12V±15%, 0.4A

Operating temperature	-40 ... +50 °C (-4 ... +122 °F)
Housing type	Plastic, wall mount
Dimensions (H x W x D)	175 x 150 x 135 mm (6.89 x 5.91 x 5,31 in)
Weight	545 g, 19,22 oz
Regulatory approvals	CE, RoHS2
Warranty	3 years



# DCR-PV PALM VEIN READER



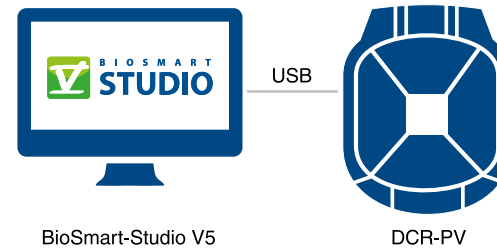
The DCR-PV PALM VEIN READER is designed to scan palm veins and enter a digital model of the scanned pattern into the BioSmart database. Connection and data transmission are achieved via a USB interface.

## Features

- High quality palm vein images
- Contactless scanning of hands
- Convenient design for easy palm positioning

## Technical Specifications

Scanning range	40-60 mm
Communication	USB 2.0
USB cable length	2 m (6.56 ft)
Operating temperature	0 ... +50°C (+32 ... +122 °F)
Supported operating systems	Windows XP, Vista, 7, 8, 10, CE, Linux
Dimensions (H x W x D)	130x150x115 mm (5,11x5,9x4.5 inc)
Weight	410 g (14.5 oz)
Regulatory approvals	CE, FCC, RoHS
Warranty	2 years



# BIOSMART UNIPASS CONTROLLER

The BioSmart UniPass controller is designed to operate two PV-WM readers via USB/Ethernet connection. The controller itself connects via a network to the BioSmart Studio v5 software, and is capable of controlling two locks or a turnstile via onboard relays.

## Highlights

- Capable of handling up to 300K users in card + palm + palm POE Source for PV-WM Read
- Simultaneous connection of two BioSmart PV-WM by Ethernet
- Wiegand input, output + interface
- Capable of controlling two locks or one turnstile



## Technical Specifications

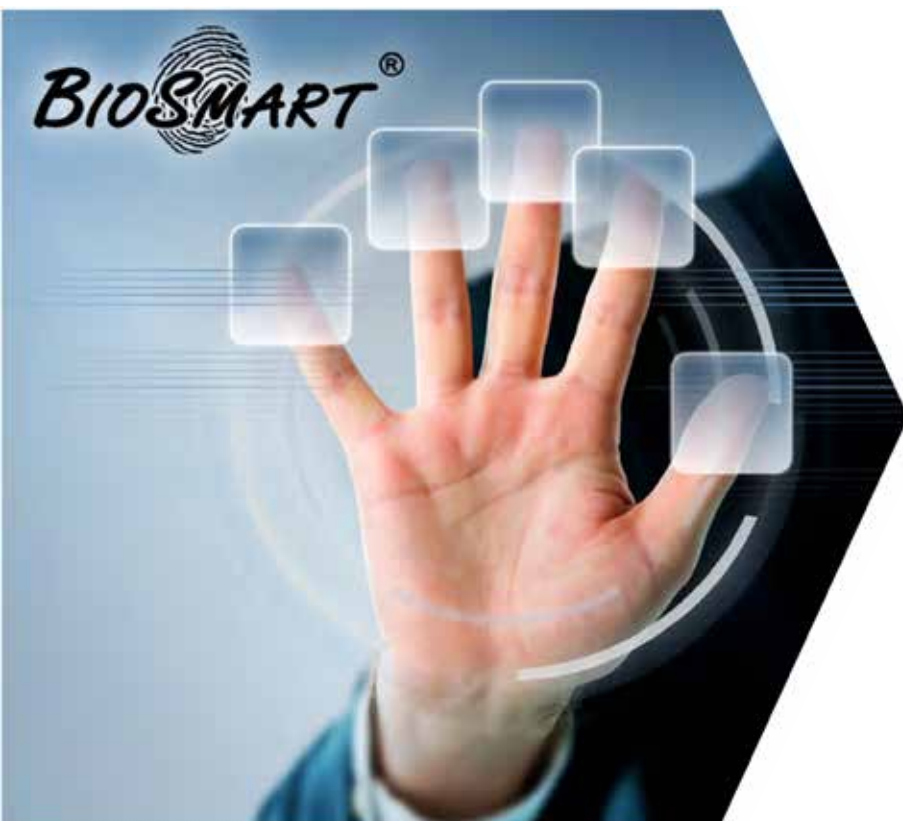
Users, card + palm or PIN + palm	Up to 300 000	Wiegand I/O	Inputs and outputs, 2 x 26/32 bits
Users, palms in local mode*	Up to 2 000	PTE button / door sensor input	6
Event log capacity	1 million	Door strike relay	2 x 12-24 V, 7A
Access schedules	250	Tamper detection	None
External RFID Reader	2 + 2 via RS-485	Power requirements	12V±15%, 1A
Palm readers supported	PV-WM	PoE (Power over Ethernet)	Only for PV-WM Readers
Interface to readers	USB, up to 5 m Ethernet (100BASE-T), up to 100 m	Operating temperature	0 ... +50°C (+32 ... +122 °F)
Match time (1:1000) in local mode, by palms	< 2 sec.	Housing type	Plastic, wall mount, DIN-rail
FAR (False Acceptance Rate)**	0,00006 %	Dimensions (H x W x D)	125 x 190 x 40 mm (4.92 x 7.48 x 1.57 in)
Communication	IPEthernet (100BASE-T), USB 2.0, RS485	Weight	300 g (10.1 oz)
		Regulatory approvals	CE, RoHS2
		Warranty	3 years

\* Depends on the number of enrolled palms. Affects recognition speed.

\*\* Calculated value: depends on quality of users' biometric data.



# FINGERPRINT RECOGNITION



Fingerprint identification is the most common and cost-effective biometric alternative to RFID cards and the good old pen & paper method. The identification process uses recognition of the ridges and spaces on the fingertips, that form structure unique to each person. Physiologically, a fingerprint is a structure that appears as pattern of papillary ridges formed by the dermal papillae that lie beneath them. A papillary image is a pattern unique to each individual, developed before birth, which does not change with age and rebuilds itself after damage.

## Principle of the Method

At the heart of the biometric method of fingerprint identification is the technology for obtaining a graphic image of the fingerprint, the creation of its vector model and the subsequent search through the system's template database for a matching template. The graphic image of the fingerprint is transformed into a special mathematical template for comparison. The original image of the papillary structure is discarded immediately after the initial transformation. This makes reverse generation of the biometric images used in this process impossible.

## Steps in the Creation of the Biometric Template

1. Improvement of the original fingerprint image by increasing the sharpness of the papillary line borders
2. Identification of the field of the fingerprint papillary line orientation. This is achieved by

splitting the image into square blocks with sides of more than 4 pixels and calculation of the t-orientation angle of the fingerprint lines based on the brightness gradients.

3. Fingerprint image binarization – conversion of the image to black and white by thresholding
4. Thinning image lines of the fingerprint – performed until the lines no longer reach 1 pixel width
5. Identification of minutia – unique characteristics of each fingerprint (end, split, break, etc.). The recorded image is split into the 3×3 pixel blocks and then the number of black (non-zero) pixels is calculated around the center.
6. Saving the coordinates and angles of the minutia identified into vector format.

## Fingerprint Matching Algorithm

1. Obtaining an image from the scanner
2. Finding characteristic fingerprint points
3. Saving the identified points to the template
4. Comparing the scanned template to the previously saved images in the fingerprint database

## Advantages of the Fingerprint Identification

- Easy and convenient to use
- Most affordable biometric solution available
- Identification is fast and reliable
- Well-developed, reliable technology

# WTC2 FINGERPRINT TERMINAL



In the WTC2 terminals, we use optical fingerprint sensors with large scanning areas and high dpi, providing accurate and fast identification. The durability of the optical sensors has been confirmed upon installation and active daily use.

The terminal, WTC2, is an IP-based device for time attendance and/or access control solutions. It operates as part of the BioSmart system, together with the BioSmart Studio software, keeping a copy of the biometric templates and providing match on device.

The terminal can operate in small systems with just a couple of devices, and in large distributed systems with remote administration and updates. The keypad on the terminal has software-defined function buttons to allow in/out, lunch break, and sick leave registrations.

## Highlights

- Match on device for fast and reliable identification
- Match on smart cards (Mifare/Desfire, HID iClass, Legic)
- Server identification for large databases
- Customization and OEM solutions
- 3 year warranty

## Features

- Fingerprint optical sensor
- Identification matches can be performed in less than 970 ms
- TFT Display 3.5"
- Touch keypad with software-defined buttons for extended functionality
- TCP/IP, RS485, USB, and Wiegand communications
- Power over Ethernet
- Support of ZFlex Relay Module
- Supports custom wallpapers

## Technical Specifications

Authentication types	Fingerprints or card Card + Fingerprints Fingerprints on smart card Pin + Fingerprints	FAR (False Acceptance Rate)	$10^{-4} - 10^{-8}$	Screen type	TFT, 3,5", 320 x 240	PoE (Power over Ethernet)	Yes
Users	5 000 (card only) 4500 (fingerprint only, card + fingerprint, PIN + fingerprint)	FRR (False Rejection Rate), at FAR = $10^{-5}$ **	0.01	Keypad	Touch, 12 buttons, programmatic function buttons	Operating temperature	0...+50°C (32 ... 122 °F)
Fingerprint templates	4 500	Sensor technology	Optical	Communication	Ethernet (100 BASE-T)	Housing type	Plastic, wall mount
Event log capacity	100 000	Image size	272x320	ZFlex Relay Module support	Yes	Dimensions (Hx-WxD)	142 x 123 x 41 mm
Match time (1:1000) in local mode, by fingerprints	< 970 ms	Resolution	500 dpi	Ethernet interface	Yes, IEEE 802.3af	Weight	320 g (11 oz)
Verification time (1:1)	< 600 ms	Smart card reader	MIFARE Classic®/MIFARE® DESFire® EV1 (13.56 MHz) HID Prox/iClass/iClass SE (125 kHz / 13.56 MHz) Legic Advant (13.56 MHz) EM Marin (125 kHz)	WIEGAND I/O	Output, 26/32 bit	Certification	CE, RoHS2
				Discrete inputs	1	Warranty	3 years
				Onboard lock control relay	12V, 1A		
				Tamper detection	1 sensor – on case opening		
				Power requirements	12V±15%, 0.4 A		

\* Calculated with an assumption of two templates per user.

\*\* Calculated value: depends on quality of users' biometric data.

# FS-80 FINGERPRINT SCANNER



BioSmart-Studio v5

USB



Fingerprint scanner FS-80

The scanner is designed for registration of fingerprints into the BioSmart Studio v5 software or with the use of the BioScan extension as part of the desktop access control system. The scanner scans a fingerprint pattern and transmits it to the computer via USB interface.

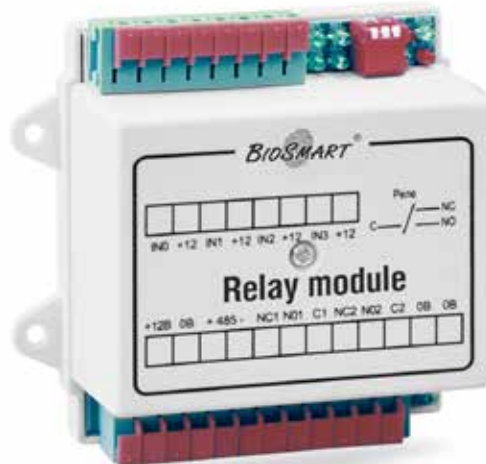
## Features

- Convenient finger positioning during scanning
- Protection against fake fingers by means of IR sensor

## Technical Specifications

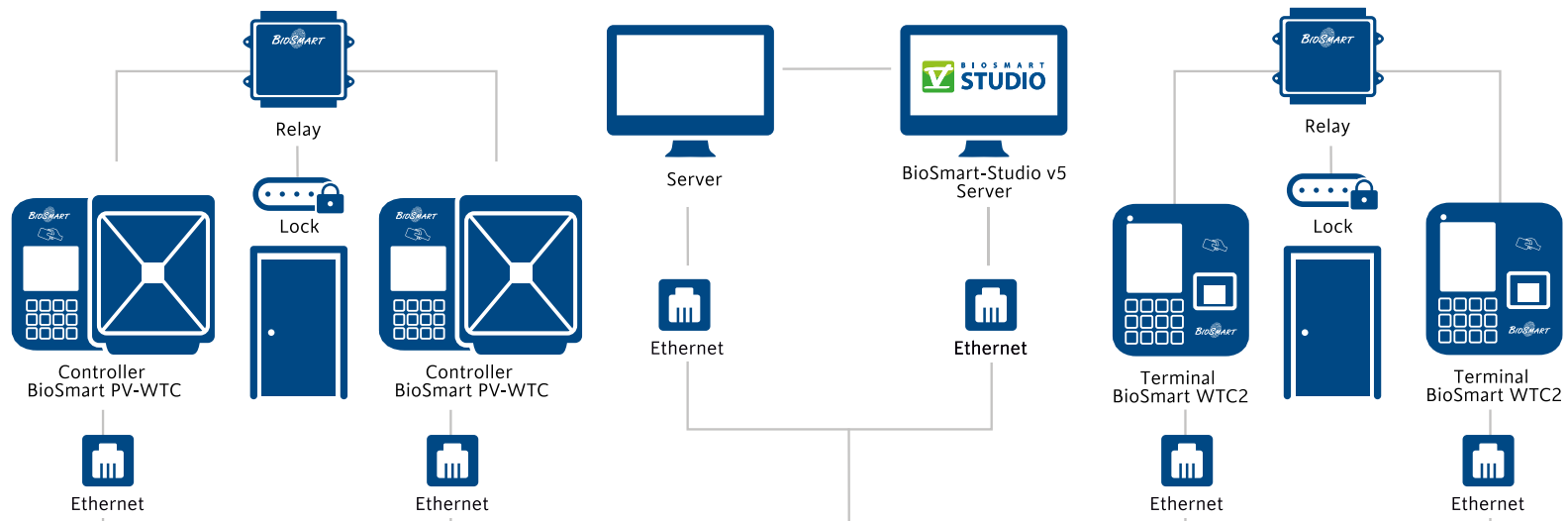
Image resolution	480x320
Resolution	500 dpi
Image format	8 bit, 256 shades of grey
Live finger detection	Yes
Communication Interface to PC	USB 2.0
Maximum USB Cable Length	2 m
Glass dimensions	16x20 mm (0.63x0.79 in)
Scanning surface dimensions	13.5 x 16.0 mm (0.53 x 0.63 in)
Operating temperature	0...+50°C (32...122 °F)
Housing	Plastic
Supported operating systems	Windows XP, Vista, 7, 8,10, CE, Linux, Mac OS
Dimensions (LxWxH)	45x63x26 mm (1.77x2.48x1.02 in)
Weight	140 g (4.94 oz)
Certification	CE, FCC, RoHS
Warranty	2 years

# ZFLEX RELAY CONTROLLER

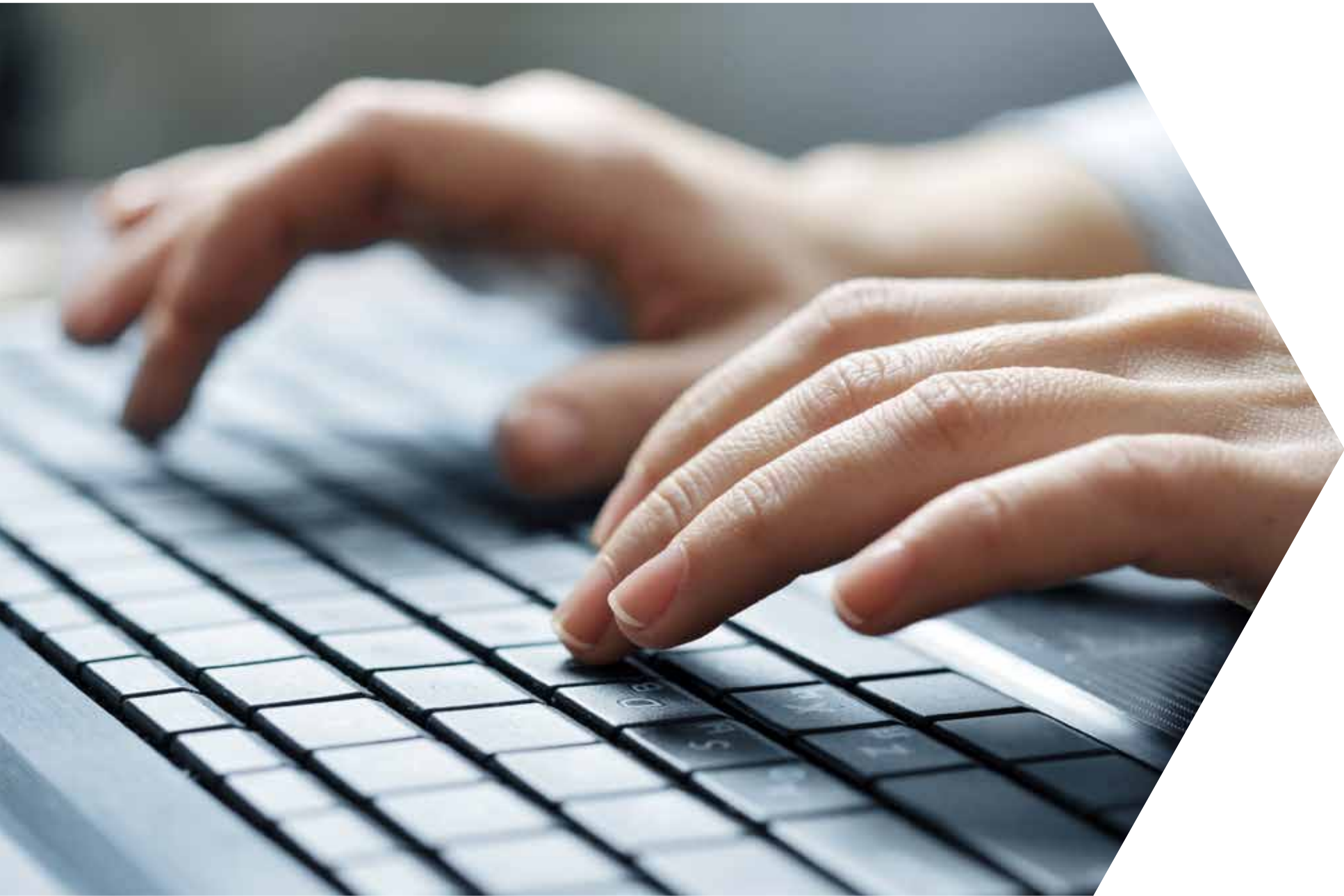


The relay module is used in applications that require an additional layer of security between the device and lock, or that require door sensors, exit buttons, signals from security and fire alarms, or operate a gateway application. The device can be connected to all the supported biometric readers via the RS-485 interface. These devices send a dynamically changing signal following successful identification.

Communication Interface	RS-485
Power requirements	12V±15%, 0,15A
Relay outputs	2
Supported power of the relays	12-24VDC, 7A
Maximum number of BioSmart devices	4
Discrete inputs	4
Operating temperature	0...+50 °C (32...122°F)
Dimensions (HxWxD)	85x87x33 mm (3.35x3.43x1.30 in)
Weight	168 g, (5.93 oz)
Regulatory approvals	CE, RoHS2
Warranty	3 years







# BIOSMART SOFTWARE

# BIOSMART STUDIO V5



The BioSmart Studio v5 provides intuitive, powerful, and customizable software to manage your biometric devices. In addition, this system supports access control and time attendance modes, as well as multiple languages.

The BioSmart Studio v5 system is in continuous evolution: new functions are added almost daily. We also offer customized solutions so you can request application-specific functionality to receive a version that is fully suited to the needs of your company.

Easy integration is available from the start.

Open and free database server reduces your bill for the whole solution.

## Features

- Access control & time attendance applications
- Support of holidays, vacations, sick days
- Multilingual interface
- Web interface
- Live monitoring of identification events
- Work time reports (more than 30 different kinds), report builder
- Export into Excel, PDF, and html formats
- Card designer
- Task planner (SMS sender, notifications, access control devices scenarios, automatic report creation and distribution by e-mail)
- CCTV integration
- Integration with Active Directory

	Light	Standard	Standard + WorkTime
License type	Free	Activation via e-mail / hardware token	
Architecture	Client-Server		
Operating system, client	Windows		
Operating system, server	Windows, Linux (on request)		
Database server	PostgreSQL 9		
Maximum number of employees	50	Unlimited	
Maximum number of cards	100	Unlimited	
Maximum number of devices	2	Unlimited	
Maximum number of client computers	1	Unlimited	
Work schedules	Local: 50; Server: Unlimited		
Access zones	Unlimited		
Maximum number of fingerprints per user	10		
Maximum number of palm vein patterns per user*	2		

	Light	Standard	Standard + WorkTime
Live monitoring	Real-time, device statuses, events, alarms, remote door/turnstile opening		
Export of reports	PDF, XLS, HTML		
Access control functionality	Yes		
Time attendance functionality	Yes	-	Yes
CCTV camera integration	-	Optional	Optional
Card designer	-	Optional	Optional
Report designer	-	Optional	Optional
Badging office (visitor passes)	-	Optional	Optional
Weekends / holidays / vacations	Yes		
Work Shifts	Day/Week/Flexible		
Third-party Integration	SAP, Axapta, Atoss		
Integration API	-	<ul style="list-style-type: none"> <li>• Database level</li> <li>• XML files</li> <li>• XML over TCP/IP (SDK)</li> </ul>	
Web access	-	With limited functionality, separate version	

\* Multiple palm vein enrollment per hand is allowed.

The BioSmart v5 software is an integral part of the BioSmart suite, providing you with convenient interfaces for user enrolment, device configuration and management of access control and time & attendance. The software has module structure, with the main part installed on the server (including BioSmart server, database server, license key server) and client part installed on all the client PCs. This makes the system easy to administer since all the critical information is located in one place. Main server further could be protected with special tools, and database can be backed up when necessary.

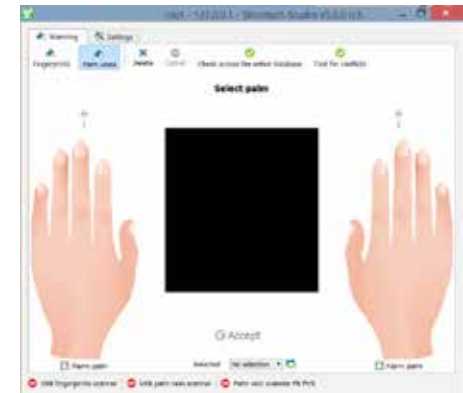
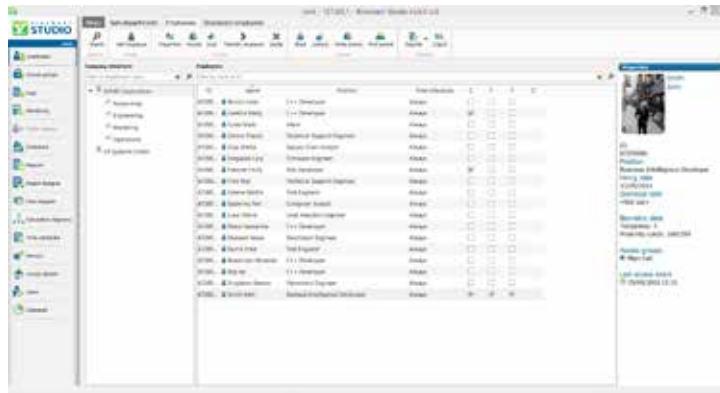
Devices communicate with the BioSmart Studio v5 via Ethernet, with the templates stored on

the devices (with server storage as an option). Templates and employee information are sent after enrolment to very device where the employee should be authorized. During its operation, every device sends back event logs. In case of missing network connection, employees still can continue using the devices. Once the connection to BioSmart Studio v5 is restored, logs are transmitted to the server.

Functionality of the BioSmart Studio v5 could be split into several areas of application, with you choosing the required functionality for your installation

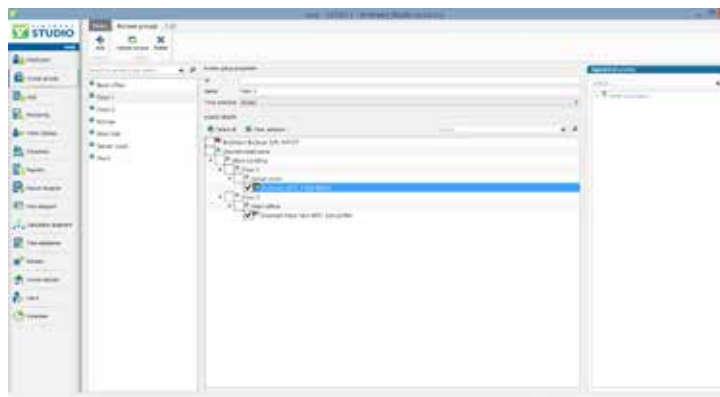
## General

- Configuration of biometric devices
- Report designer for customing TXA reports
- Export into HTML, PDF, CSV
- Import from CSV or Excel
- Job scheduler for automatic sending of reports to email, or text messages in case of alarms
- Card designer
- Virtual machines support
- Web interface to the main functionality
- Integration with third-party software
- Server template storage and server matching as an option
- Feature customization on request



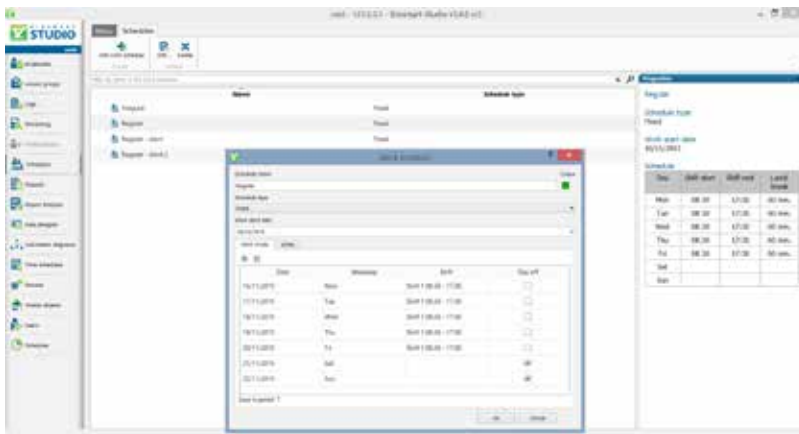
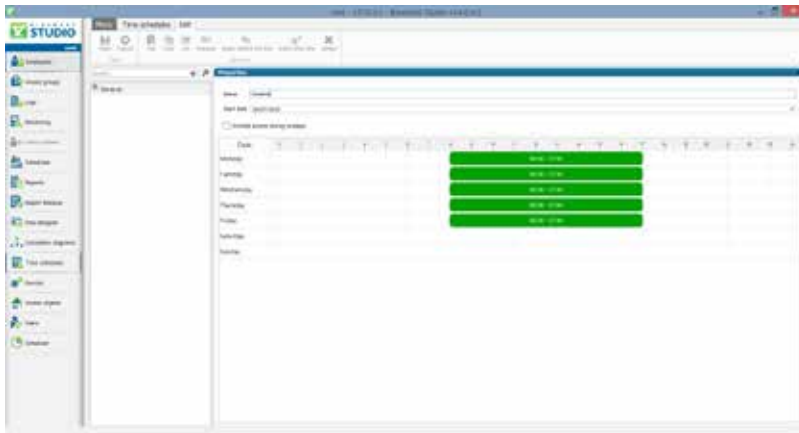
## Access control

- Anti-passback and occupancy counting
- Access zones (with one-door precision)
- Access time schedules
- Escort mode
- Alarm/event processing/filtering
- Visitor passes
- Real-time event monitoring
- CCTV support



## Time & attendance

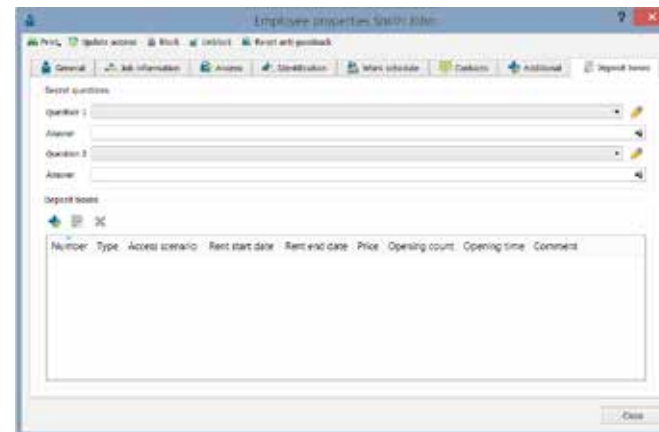
- Muster roll report
- Schedules
- Holidays, vacations, sick leaves, and absence permissions
- Work shifts



- SAP HR integration

## Safe Deposit Boxes

- Management of deposit boxes
- Selection of rental period
- Assignment of client and trusted persons to a box
- Secret questions for client identification
- Pre-defined role templates to divide system operation rights among bank employees







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