



# **ID-TARGET**

## **TECHNICAL DESCRIPTION**

**IDTG.TI.DOC.990**

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# 1 INTRODUCTION (PURPOSE)

The system is designed to improve the quality of service for visitors to a salon or store by collecting information about them based on images obtained from cameras. At the time of detection, an incoming client is identified and, if available in the database, information about it (client importance, frequency of visits, average number of purchases, average check, etc.) is displayed in a mobile application or in a browser. This allows:

- Classify customers according to various criteria: regular visitor, VIP, etc.
- Fix for each regular customer employee
- Offer more personalized goods or services

Using this information, the system can view various reports and statistics:

- Summary statistics of store visits by gender/age
- Shopping at various hours
- Repeated visits to the store

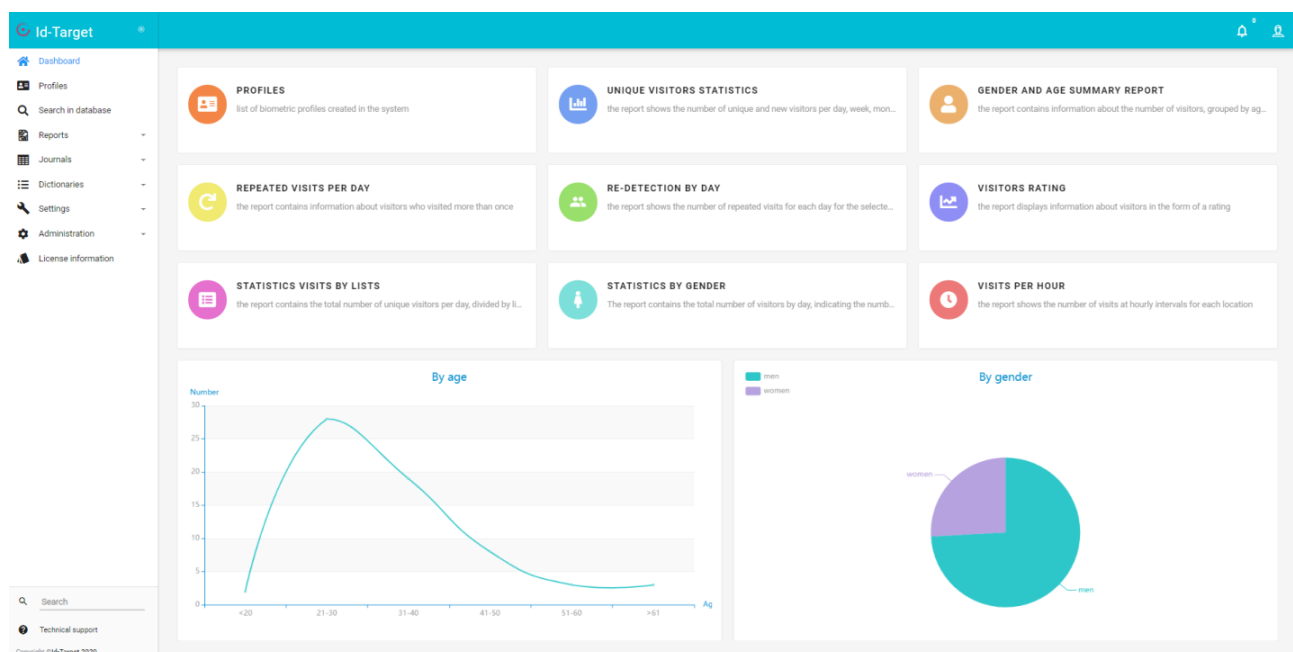


Figure 1. System dashboard

Using this dashboard, you can:

- Manage a database of customer profiles, merge identical profiles
- View statistics and reports
- Insist on equipment and its location

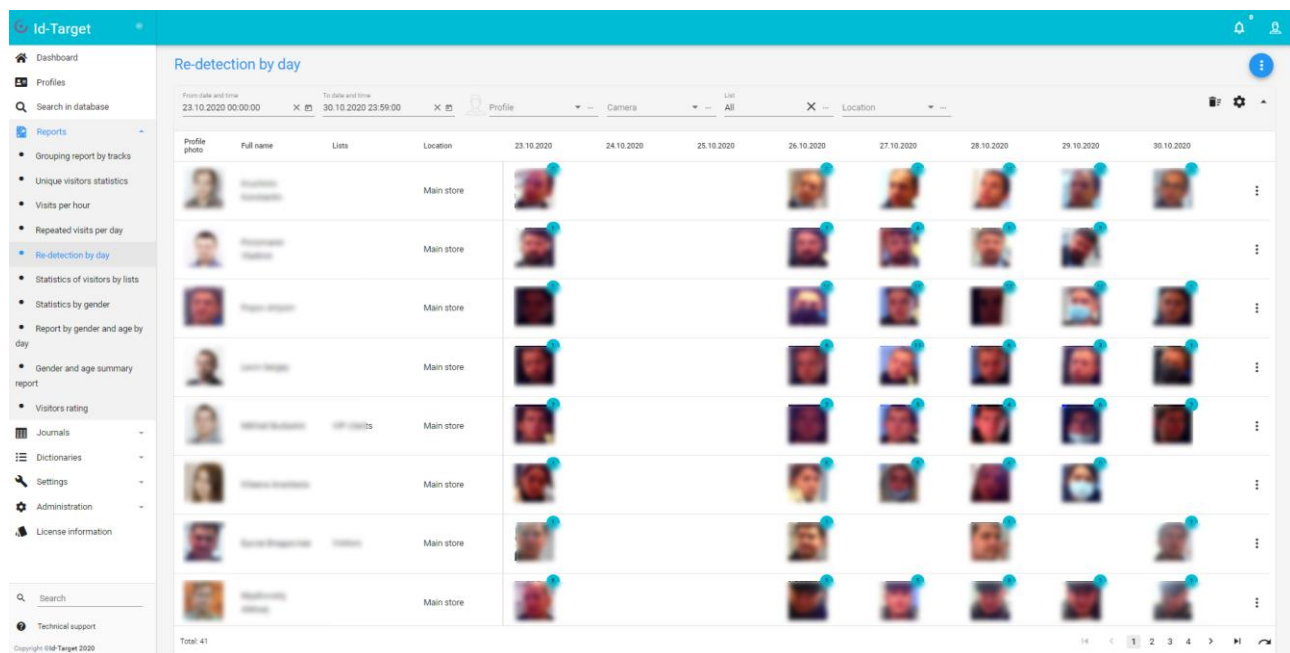


Figure 2. Report appearance

The System is scalable and supports the ability to work with multiple cameras.

## 2 SOFTWARE DESCRIPTION

### 2.1 SYSTEM COMPONENTS

For the correct functioning of the System, the following minimum equipment is required:

- Server
- Client computer
- Monitor
- Camera(s)

Additionally, you can use the application for a mobile device.

A detailed description of the recommended characteristics of the equipment is indicated below.

### 2.2 ARCHITECTURE

The System consists of the following components:

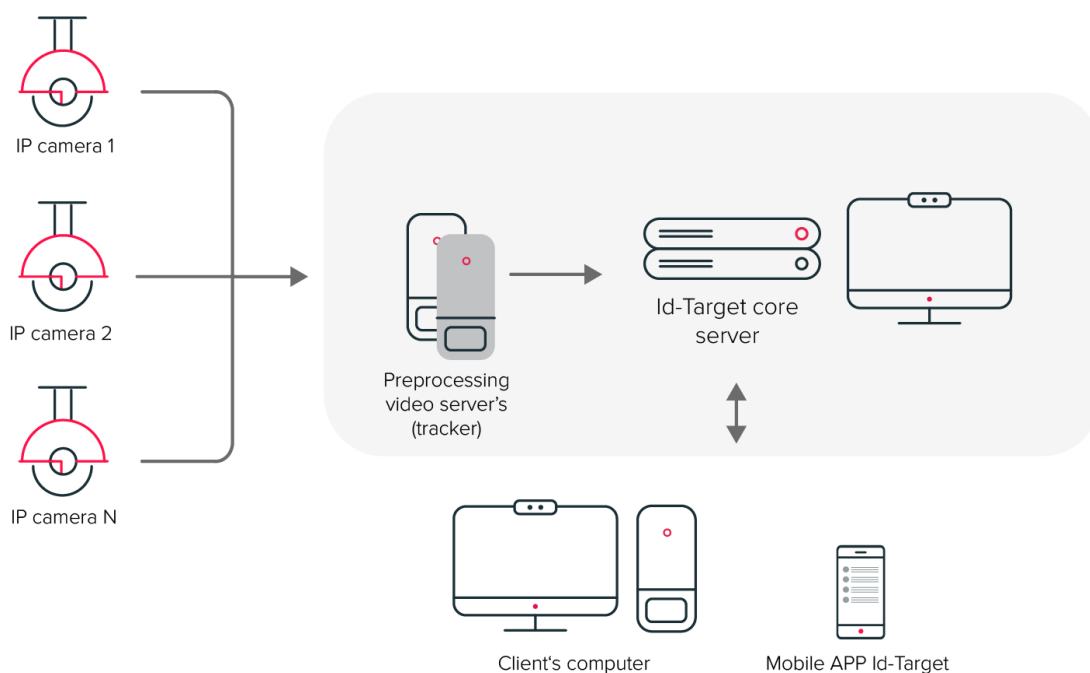
- **Id-Target Core** — the server part of the system, consisting of separate services, including the System settings interface, recognition algorithms, database and reports;
- **Id-Target (Desktop) application** — part of the system responsible for interacting with Id-Target Core and displaying information about visitors on a client PC;
- **Id-Target (Mobile) application** — part of the system responsible for interacting with Id-Target Core and displaying information about visitors on a client mobile device;
- **Preprocessing video server (Tracker)** — is an application that processes the video stream from the camera for face recognition.

It is recommended to install the System components as follows:

- **Server:** Id-Target Core + Tracker
- **Client computer:** Id-Target application (Desktop)

- **Client mobile device:** Id-Target (Mobile)

A schematic diagram of the installation of system components is shown below (**Figure 3**).



**Figure 3. Schematic diagram of the connection of the System components**

## 2.3 TECHNOLOGIES

The System is developed using the following programming languages and software:

- Golang
- C#
- Angular
- RabbitMQ
- Nginx
- PostgreSQL
- Redis

## 2.4 LIST OF ID-TARGET CORE SERVICES

Id-Target Core includes the following services:

**Table 1. Id-Target Core services description**

Service	Description	Port
<b>Nginx</b>	A web server and mail proxy server	80, 443, 23231
<b>PostgreSQL</b>	Free and open-source relational database management system (RDBMS)	5432
<b>RabbitMQ</b>	Service providing work with data queues	5672, 15672
<b>Redis</b>	NoSQL database, open-source software	6379
<b>mkv-client-profiles-import</b>	Service for importing profiles into the system	8851

Service	Description	Port
<b>march-storage</b>	Storage service for the archive	11062
<b>mi-saver-incident</b>	Service sends notifications about various incidents	11069
<b>mkv-server-report</b>	Service for generating reports. Includes reports by gender, age, visits	11084
<b>support-server-api</b>	Monitoring service that allows to work with metrics and desktops	11091
<b>mkv-server-url-shortener</b>	URL shortening service	11092
<b>mas-server-api</b>	Management service, which provides API for processing data about devices, applications, cameras	11101
<b>mas-server-settings</b>	The main purpose of this service is to store and send the configuration to the modules. This service is run first. If an error occurs while the service is running, the system will not start	11102
<b>mfs-server-api</b>	Service for storing and working with images	11300
<b>mfs-server-thumbnail</b>	Service for working with thumbnails of the file storage	11301
<b>mfs-server-url</b>	Service for processing image requests by URL	11302
<b>mi-sender-email</b>	Service sends e-mail notifications	11400
<b>mi-sender-http</b>	Service sends notifications by http (push)	11401
<b>mi-server-api</b>	Service is used to perform notifications	11403
<b>mkv-server-admin</b>	User interface for the system administration module	11500
<b>mkv-server-api</b>	The service contains API methods to work with the main functionality of the system	11501
<b>mkv-server-auth</b>	Service for authorization in the system by entering a username and password	11502
<b>mkv-server-ws</b>	Application's back-end in order to work with the client via WebSocket	11503
<b>backup-client-server-api</b>	System data backup service	11506
<b>monitoring-server-windows</b>	Services for monitoring statuses of the running services	11507
<b>logging-server-api</b>	Service is used to get logs from services	11508
<b>event-configuration-api</b>	Service is used to simplify working with event-storage, so that a single request creates a pool of necessary entries in the dictionaries for event processing	11509
<b>event-storage-server-api</b>	Service for processing system events and performing various actions depending on the type of event (sending an email after creating a business notification)	11510
<b>mmpd</b>	Manager module of detection processes	11600

Service	Description	Port
<b>march-server-api</b>	Archive management service	11601
<b>modi-image-worker</b>	Image processing service (crop/resize and etc.)	11700
<b>modi-server-api</b>	Service for processing discrete images	11701
<b>modi-ubda-tevian-[01-04]</b>	Service for processing photos: searching faces and creating biometric templates	11710 y [01], 11711 y [02], 11712 y [03], 11713 y [04]
<b>mrp-server-api</b>	Service that provides API for processing data during working with the streaming video	11800
<b>mrp-matching</b>	Service provides facial recognition process by the images provided	11806
<b>march-mrp-matching</b>	Face recognition service	11810
<b>mrp-server-broker</b>	Service is used to manage a request queue to the matching algorithms	11821
<b>ms-server-filecache</b>	Service provides caching files	11900
<b>mkv-scheduler-api</b>	Service that implements work with scheduled tasks	11910

One of the server requirements for installing the Id-Target Core software package is the absence on the server of the software specified in the table above and the presence of free ports indicated in the table.

## 3 REQUIREMENTS FOR CORRECT WORK

### 3.1 ID-TARGET SERVER

It is recommended to install Id-Target Core. Server characteristics directly depend on the number of cameras processed by the system. An approximate calculation for the most common values is presented in the table below.

**Table 2. Server requirements**

Number of cameras	CPU (Core)	RAM (GB)	HDD (GB)	SSD (GB)
1	5	16	600	300
2	6	16	700	300
3	8	16	700	300
5	20	24	800	300
7	14	24	900	300
10	18	40	1000	300

**Operating system:** Windows 10 Pro (2004 and later, according to the end date of the operating system support), Windows Server 2016/2019 and later. If you have the “Windows 10 Pro N” OS edition installed, you have to additionally install the “Media Feature Pack” component. The account (login/password) (including for a remote user) must remain unchanged throughout the installation. The account (login/password) must allow upgrading privileges to Administrator if necessary.

The following components **must not** be pre-installed on the server:

- PostgreSQL
- RabbitMQ
- Redis
- Web server that uses ports 80 and 443

## 3.2 CAMERA INSTALLATION

- The camera must be fixed using the special bracket supplied to minimize the blurring caused by the movement of the camera. It is allowed to mount the camera on a tripod; the camera installation height is from 1.5 to 2 m.
- The recommended camera placement: a person looks at the camera and moves towards it or across the camera's line of sight.
- Screens, interactive kiosks, boards, banners should not block a person moving.
- For recognition and identification purposes, it is required to use cameras with varifocal lenses.
- The lens focal length must be in the range from 9 to 40 mm.
- The camera tilt at the end of the face detection area should be within 15 deg.
- The optimal camera height above the floor is 2.2 m, it is desirable that the beginning of the face detection area is located further than 8.0–8.5 m.
- If cameras are mounted indoors, uniform and constant level of illumination must be provided. For proper facial recognition, indirect lighting must provide such conditions, when visitors' faces have uniform illumination without shadows or glare. The recommended light intensity is about 300 Lux (minimum 150 Lux, maximum 600 Lux).
- At the beginning of the process of facial recognition, it is required to mount and configure a camera so that the size of an adult's face is about 160x160 pixels (the line of sight is more than 2 meters in width — a little wider than the width of outstretched arms).

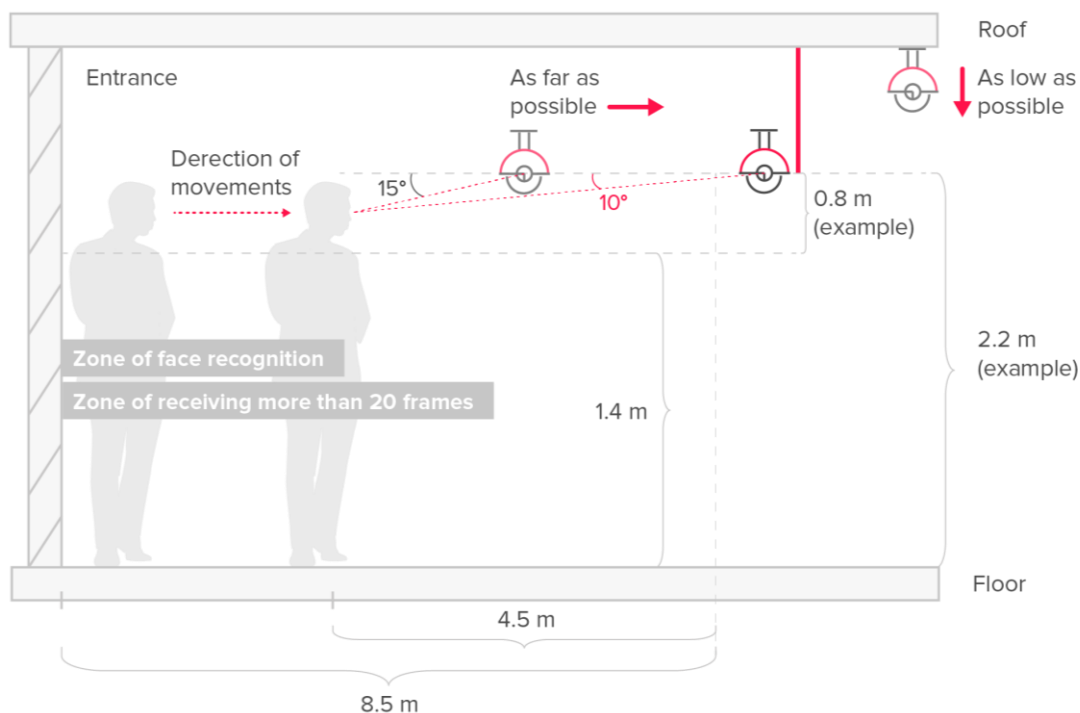


Figure 4. Camera placement recommendations



## 4 LANGUAGE SUPPORT

The Id-Target software is a multilingual solution that allows you to choose from the following language options:

- English (by default)
- Spanish

The list of available languages can be expanded upon request.

## 5 DOCUMENTATION LIST

- Id-Target Administrator's Guide
- Id-Target Operator's Guide

## 6 SOFTWARE MANUFACTURER

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