BRIO

GROUP OF COMPANIES

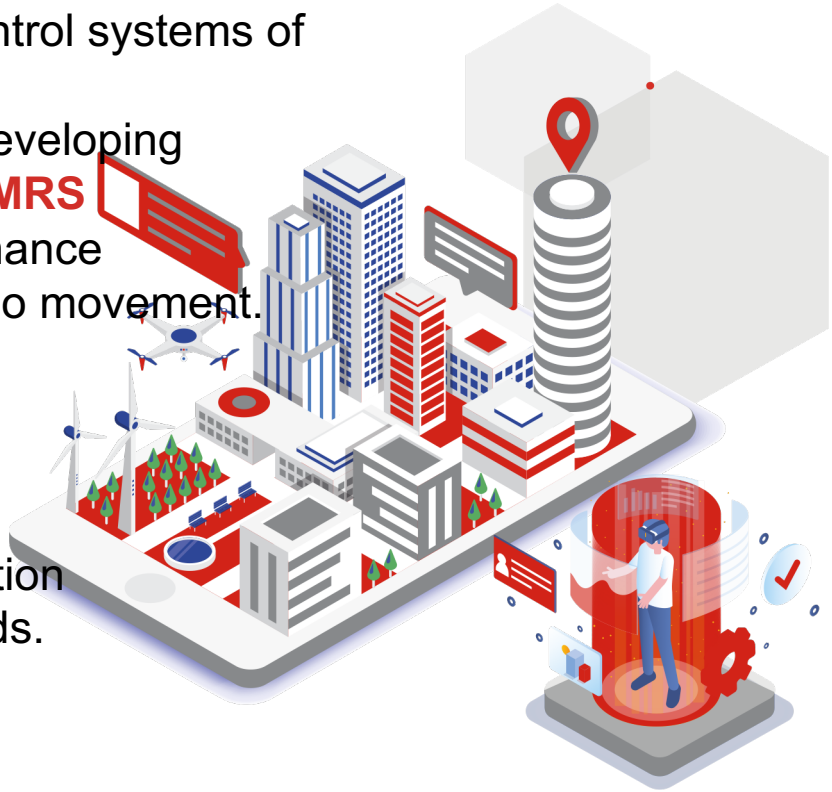
BRIO MRS VISUALIZES BIM-PROJECT AT CONSTRUCTION SITE IN REAL TIME

BRIO RTS/S IDENTIFY PERSONNEL LOCATION AND COMPLIMENTS SECURITY SYSTEMS

ABOUT US

Group of Companies BRIO is a fast-growth holding company includes several companies, which main activities are:

- managing construction as a technical customer's service;
- developing BIM-projects;
- research and development of automated control systems of business processes;
- combination of innovative technologies by developing a Mixed Reality System for construction **BRIO MRS** and a multifunctional solution **BRIO RTS** to enhance security and personnel location, as well as cargo movement.



Project's global goal is to change the builders philosophy in the area of construction digitalization and implementation of lean production standards.

BRIO MRS

The Mixed Reality System for construction **BRIO MRS**.

PROBLEMS

CONSTRUCTION PROJECTS

DRAWINGS AND PAPER DOCUMENTS

No digital model of object on construction sites

CONSTRUCTION COMPANIES

— Reserve budgeting for mistakes;
— Low working speed;
— High cost of works.

SUPERVISORS

— Time and effort consuming supervision;
— Mistakes recorded but not pre-epmted;
— High level of corruption.

MANAGEMENT & CONTROL SYSTEM

— Requires digitalization of all information.

Deadlines are not respected

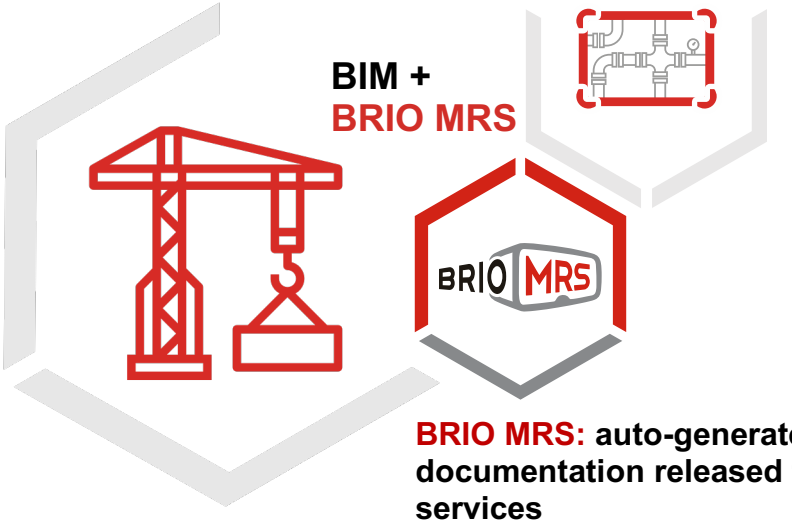
Lack or inefficient use of BIM-project

High cost and budget overruns

Labor-intensive document reviews

SOLUTION

CONSTRUCTION PROJECTS



BRIO MRS: auto-generated documentation released for all services

CONSTRUCTION COMPANIES

- Improved working speed and quality;
- Labor easing;

SUPERVISORS

- Real-time operation;
- Pre-empted mistakes;
- Minimized labor costs;
- Excluded corruption.

MANAGEMENT AND CONTROL SYSTEMS

- Working with digital objects directly on construction site;
- Release of information.

Construction time reduced by 10%-20%

Maintenance cost savings up to 10%

Construction and assembly operations cost savings of 5%-7%

Real-time supervision of construction site

BRIO MRS PLATFORM

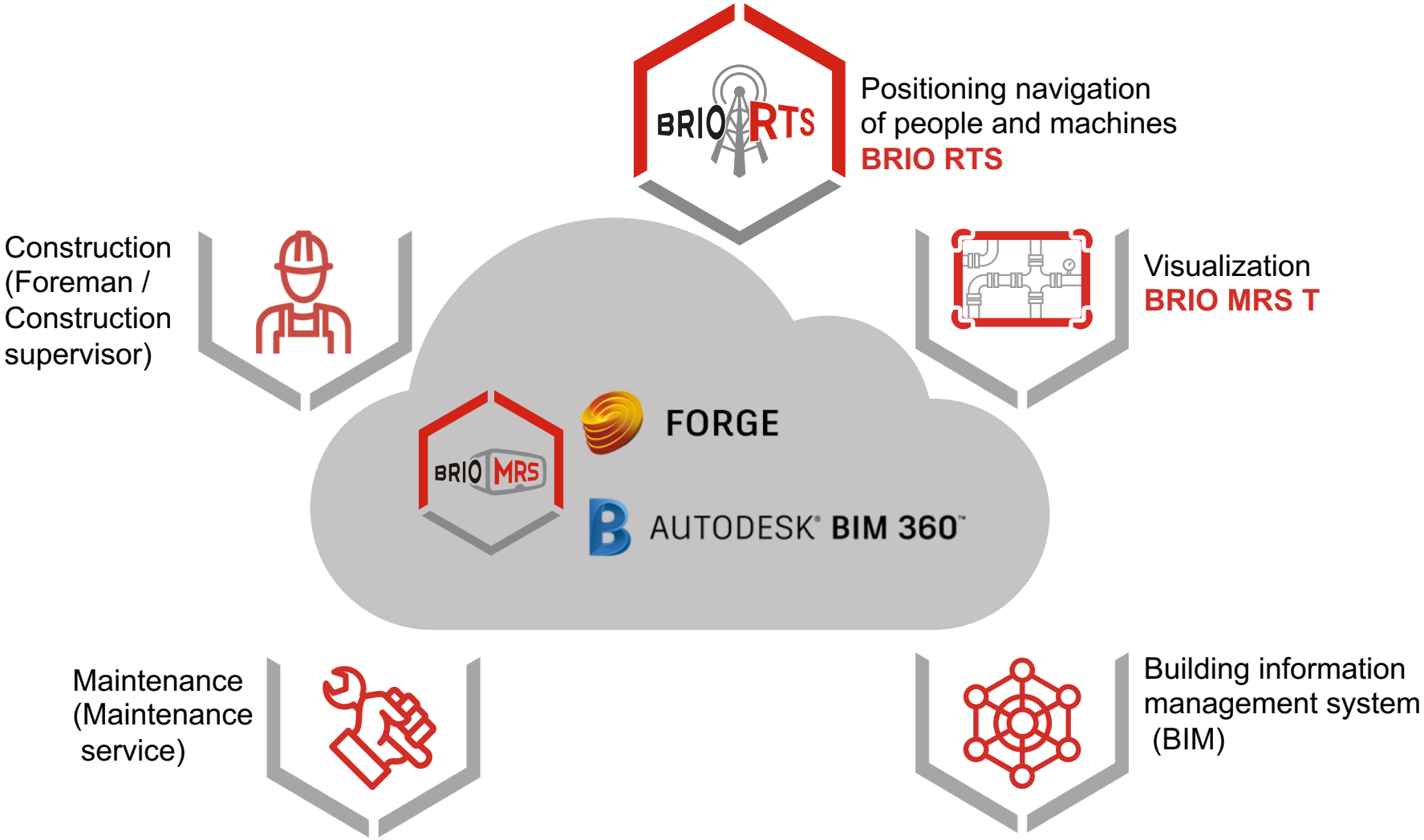
The **BRIO Mixed Reality System** technological hardware-digital platform visualizes digital objects building them into the real world.

BRIO MRS Platform provides tools for real-time work with digital information of a building and utility systems **directly on construction site**.
It enables more effective management of project designing, construction, operation and liquidation at all stages of project life cycle.

BRIO MRS integrates the following technologies:

- Mixed Reality;
- BIM (Building Information Modeling) technology;
- Precise Positioning.

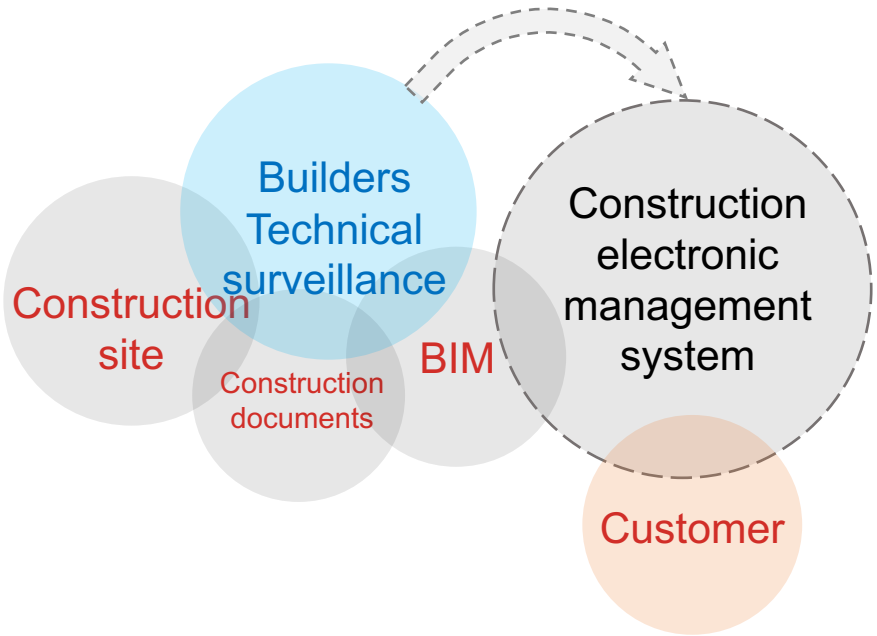
PLATFORM STRUCTURE



CREATION OF A COMPREHENSIVE BUSINESS PROCESS

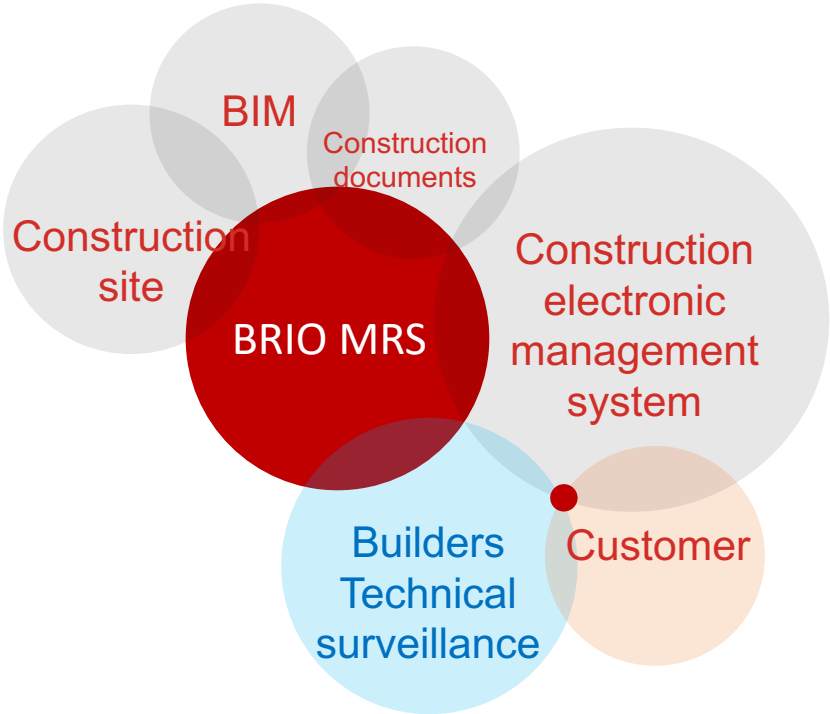
TODAY

Lack of digital modeling on construction site. Automated construction management is not possible.



IN THE BRIO MRS SYSTEM

A comprehensive mixed reality platform based construction management vertical business process.



COMPLEX SOLUTION FOR THE CONSTRUCTION SITE

THE QUALITY, SAFETY AND TIMING OF THE PROJECT ARE UNDER COMPLETE CONTROL

Integration with **BIM 360 Build** allows complex interaction with the construction and installation coordination system, which provides effective interaction between the office and the construction site.

- Quality and safety are higher
- Right on time. Exactly like in cost estimate
- Every drawing is under control

OPPORTUNITIES

The cloud-based technologies within **BIM 360 Build** ensure effective collaboration of professionals from all organizations working on the construction site with the **Brio MRS tablet**. Full control over construction progress and installation works helps to deliver objects on time, with high quality and in compliance with all safety standards.

- Site inspection and daily reporting
- Ensuring occupational safety and interaction of specialists
- Information requests and registration of drawings

DESIGN AND ESTIMATE DOCUMENTATION

FULL OWNERSHIP OF INFORMATION + MORE PREDICTABLE CONSTRUCTION

BIM 360 Docs enables **the BRIO MRS** tablet to transfer, review and approve models, drawings and construction plans efficiently

- No unnecessary actions
- Effective interaction
- One source of information

OPPORTUNITIES

BIM 360 is a cloud platform that brings together all participants of design and construction activities and provides them with anytime access to data both in the office and on the site with the **Brio MRS tablet.**

- Document access control and access from the BRIO MRS tablet
- Support 2D and 3D drawings and its publication
- Electronic tags and version control

BIM-MODEL COORDINATION SOLUTION

CLEAR COORDINATION OF PROJECT SECTIONS AT THE CONSTRUCTION SITE – MORE EFFECTIVE DIGITAL CONSTRUCTION APPROACHES

The **BIM 360 Glue app** gives access to BIM models for all professionals working on different sections of the project in disparate CADS directly on site with the **Brio MRS tablet**.

- Cloud interaction
- Fast collision detection
- One source of relevant data

OPPORTUNITIES

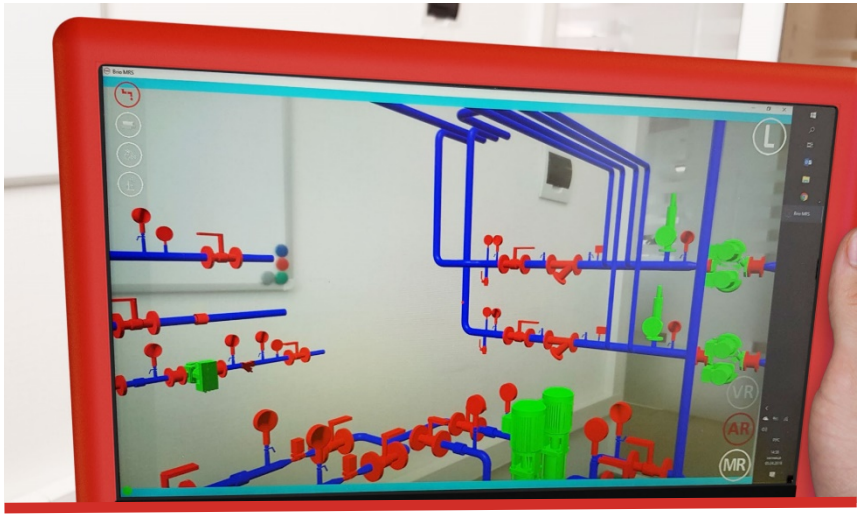
BRIO MRS is a platform for interaction of specialists directly on the construction site. Built-in navigation and display of up-to-date drawings help to avoid cost errors on the construction site.

- Access to 3D models and simple model navigation
- Coordination of project sections and the ability of fast measurement
- Integration with the information model management system into construction process

PRINCIPAL DIFFERENCE BETWEEN AR AND MR TECHNOLOGIES

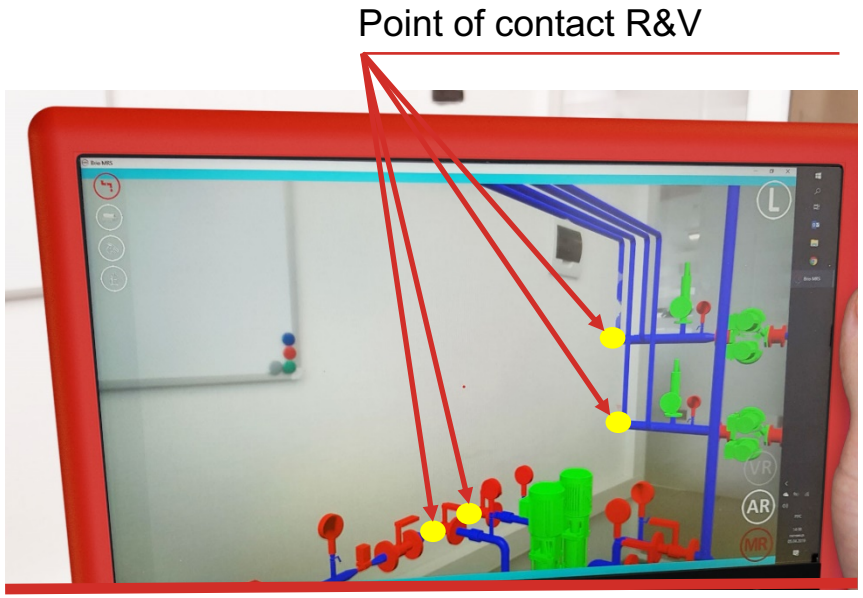
AUGMENTED REALITY (AR)

Digital content is superimposed on the real word with geometrical dimensional distortions. Here is how the competing solutions work

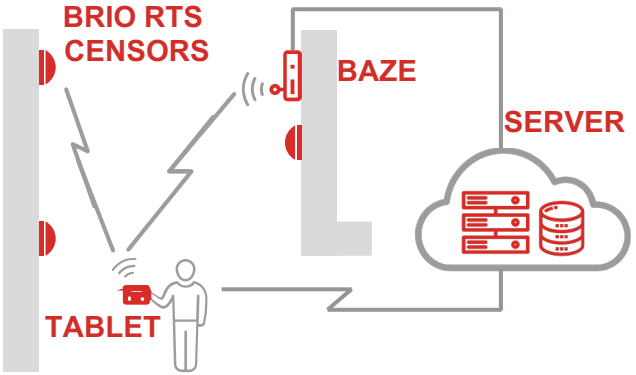


MIXED REALITY (MR)

Digital object is correctly integrated in the real word and interacts with it in the points of contact without any dimensional distortions. Here is how the **BRIO MRS** platform works.



HOW OUR PATENTED TECHNOLOGY WORKS



Knowing its location, the system places digital models in the real world with absolute coordinates. And 3D model of space cuts off the invisible parts of digital models. This results in a BIM model embedded in the real world, where real and digital objects have a common ground. **The system displays on the tablet BIM-model built into the real world.**

The **Brio MRS tablet** has a specialized stereo camera. It creates a three-dimensional model of visible space. All of this happens in real time

The **Brio MRS tablet** has a patented combined tracking technology. Tracking takes data from three sources: optical tracking (SLAM), radio tracking and inertial tracking. The data is combined using a patented unique confidence algorithm. Thus, the tablet always knows where it is with an accuracy of 3-10 cm in dynamics.

HOW OUR PATENTED TECHNOLOGY WORKS

An ordinary tablet does not have the right quality components, specialized software and the necessary computing power.
Therefore, an ordinary tablet will not be able to do what the **BRIO MRS** tablet does.
BRIO MR-glasses also work this way.

COMPETITIVE ENVIRONMENT

There are currently no direct analogs of **BRIO MRS**. There are some solutions that can be described as analogs of the BRIO MRS platform components.

HoloLens, Daqri, Magic Leap (glasses)	**BRIO MRS (tablet)**
Augmented Reality (AR)	Mixed Reality (MR)
Only orientation*	Orientation and position
Requires manual location referencing	Automatic location reference
Image projection	Stereo image
30°- 40° viewing angle	90° viewing angle horizontally, 60° - vertically
RAM up to 1GB	Unlimited RAM
No information modeling management system networking	Networks with information modeling management system

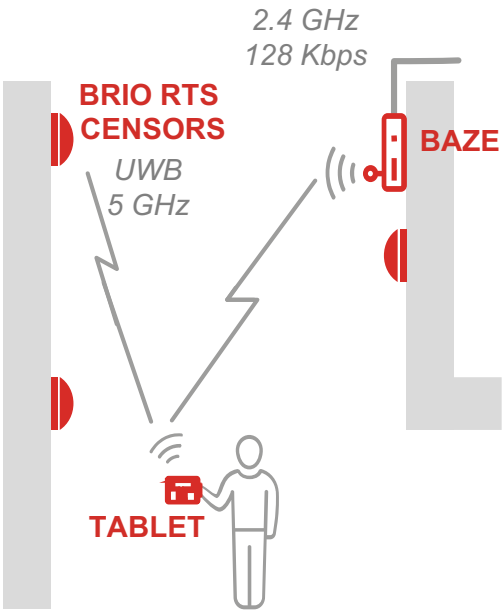
** he above solutions identify dimensional position based on optical and inertial tracking, which in few meters accumulate errors (drift) and lose accuracy .*

PRECISE POSITIONING

Up to 3 cm with QR-codes

Requires initial preparation of construction site. Big error is possible due to accumulated drift

Up to 10 cm with BRIO RTS radio tracking

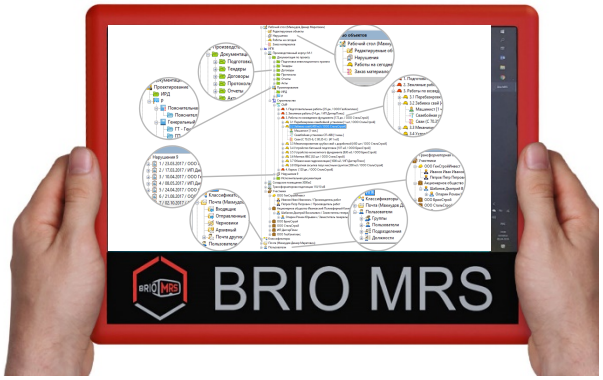


Construction cost increases. However, it is possible to improve personnel efficiency and safety

Up to 1 mm with robotized total station

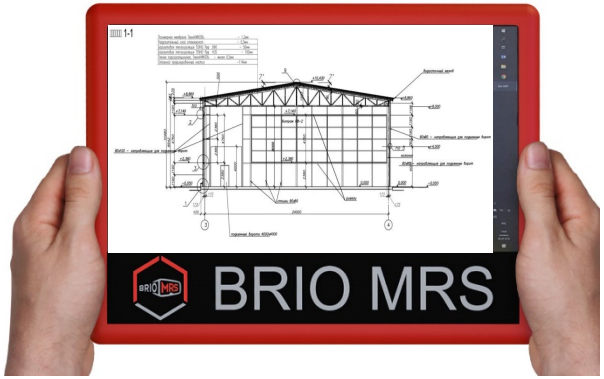
Accuracy is achieved only in static position

PREFERENCE OF TABLET OVER GLASSES



Quick access to all project information

AUTODESK® BIM 360™



Displays 2D drawings referenced to location where the user is

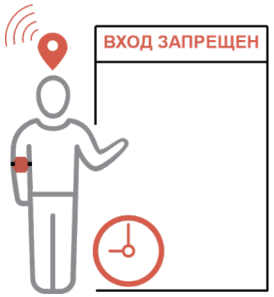
Quick access to metadata of the information model and submission of Technical Customer’s requirements to each of its elements

BRIO RTS

Multifunctional monitoring system for personnel and cargo movements **BRIO RTS**.

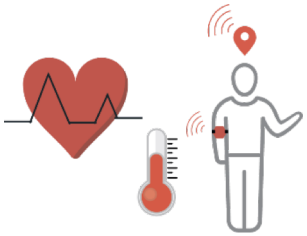
THE CONTROL OF TRANSPORT LOCATION

MONITORING OF PERSONNEL AND ASSETS LOCATION



CONTROL OF ACCESS LEVELS AND WORKING TIME

PREVENTS COLISSION WITH A STATIONARY OR MOVING OBJECT



TRANSFER OF MEDICAL PARAMETERS

FIXATION OF THE FALL OF EMPLOYEE AND CARGO

BRIO RTS/S

BRIO RTS – is a **multifunctional solution** applied in **different industries** that by tracking the employee and cargo movements helps **improve labor productivity** and fulfilment of production standards, **reduce injury** and **improve efficiency** of the personnel.

BRIO RTS/S – The solution that enables a company to enhance security with a combined security device.

THE SOLUTION INCLUDES:

Smart keychain (carried tag), may include:

- *reader and emitter RFID;*
- *acoustic amplifier;*
- *management controller;*
- *pulse and temperature sensor;*
- *step tracker;*
- *acoustic sensor;*
- *breathalyzer;*
- *and other devices.*

Position sensor

Base with wired connection to the server

Combined security device

Key box

Server

POSIBILITIES

Shows the current location of objects in the indoor diagram in real time

Displays operational information about the object

Stores tracks archive for a given period and generates a heat map for each worker or object

Allows to analyze the movement of personnel and cargo

Detects the owner activity and signals about his inactivity or attempted fraud

Recognizes the owner by reading the RFID tag from the pass, may include the RFID tag and replace the pass

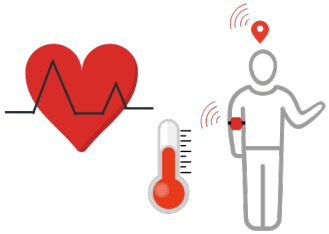
Provides intelligent protection against penetration into a specific area

Provides one-way voice or paging communication from the dispatcher to the tag owner

STAFF HEALTH

This solution allows to track employee and cargo movements as well as **health condition**, and helps to **reduce injury.**

ANTICOLLISION



TRANSFER OF MEDICAL PARAMETERS

Built-in breathalyzer allows pre-shift monitoring and identification of persons who cannot be admitted to work;

Built-in portable pulse and temperature sensor allows you to track pulse and temperature of each employee quickly transmitting information to the panel;

A portable device attached to employee prevents collision with a stationary or moving object;

The presence of an alarm button on the portable device allows the personnel to notify supervisor about the incident;

The presence of a sensor fixing the fact of the fall allows you to quickly assist the injured personnel;

A portable device attached to employee allows rapid evacuation of personnel in case of emergency

RTS vs Wi-Fi

ADVANTAGES	BRIO RTS	Wi-Fi
ACCURACY	10-100 cm in almost any environment	about 5m in perfect surroundings
COST	5-10 times cheaper	10 times more expensive
POWER CONSUMPTION	0,1 W/h e.i. ~10 times less	on the whole 1 W/h
CONFLICTS WITH OTHER DEVICES	none	may be
SPEED	50 times per second at 50 cm accuracy	1 time per 5 second at 10 m accuracy

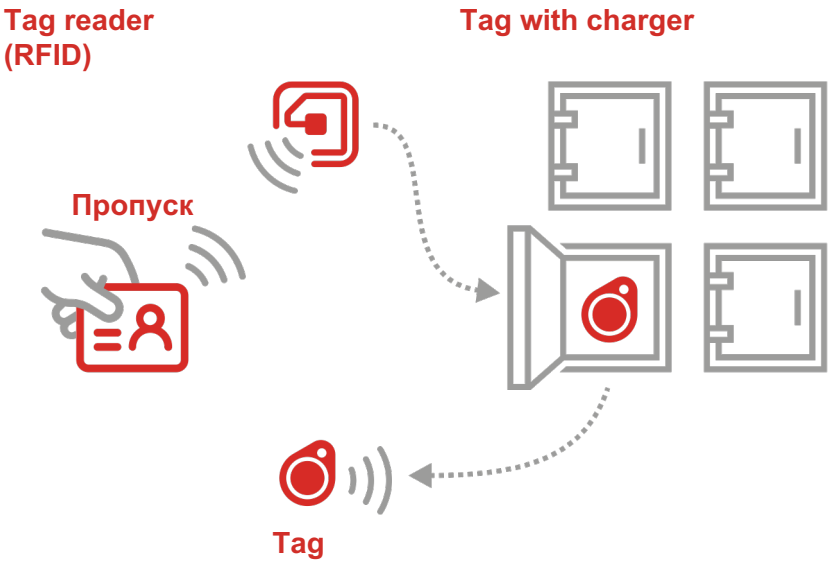
Solutions based on Wi-Fi are not suitable for tasks of personnel and cargo tracking in industry and production

KEYCHAIN (carried tag)

Procedure for obtaining and binding a tag:

- Tags (key rings) are stored in the key holder, where they are charged with a wireless charger;
- The worker can take a mark in one key holder, and hand over in another – it is not necessary to return them to the basic key holder;
- The worker at the beginning of the shift goes through the Face ID and the fingerprint reader process; the system opens the cell after employee identification;
- The tag includes RFID, and can preserve the existing access control architecture.

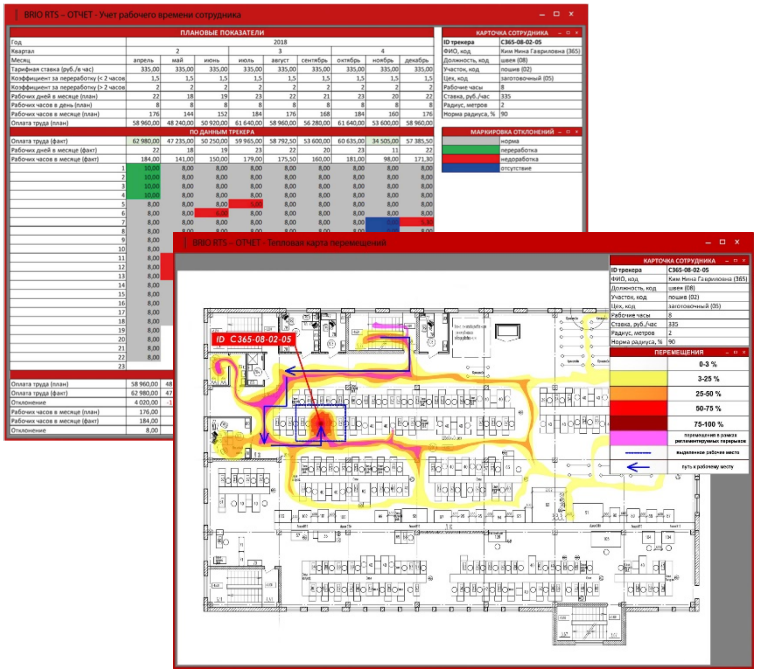
The worker always gets a fully charged tag, because the smart system detects charge level of each tag!



Working time of the tag minimum 15 hours (can be changed for specific customer requirements)

REPORT FORM

Functional report for personnel control and work planning of a company. Analytics output is possible in the form of standard and individual reports based on tables and graphs (statics and dynamics).



Normalize and track various operations and movements; formed data tables are based on the time of the route and its compliance;

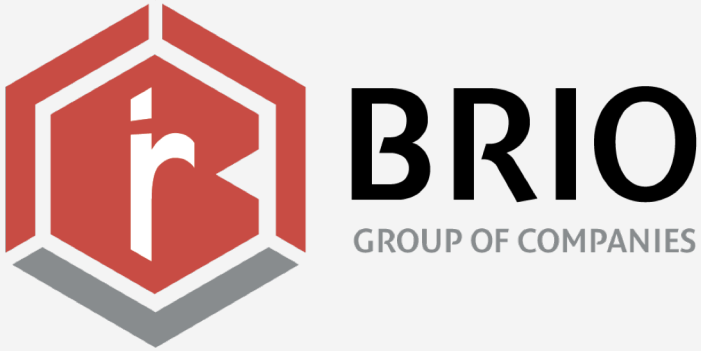
Visually and conveniently analyze the statistics of movements the chart is issued in the form of a heat map (with one or more ID);

Identify objects, their position in space and the trajectory of movement ID is assigned to workers and goods and materials requiring monitoring;

Generate reports based on staff list with the ability to assign additional characteristics and allocation of roles (including special control);

Generate reports for commodities and materials in accordance with the production cycle stage;

Choose required period: day, week, month, quarter, year.



THANK YOU FOR YOUR ATTENTION WE WILL BE PLEASED TO ANSWER YOUR QUESTIONS

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