DMMS

DIGITAL MONITORING & MANAGEMENT SYSTEM

TM

DMMS SMART WATCH

personnel condition and exact position monitoring

DMMS SMART WATCH

We offer the implementation of a system to monitor and control the social distance of personnel, with the function of managing anti-epidemiological measures within industrial enterprises. The system will allow you to monitor the movement of personnel, equipment and inventory in real time at industrial premises of any size.



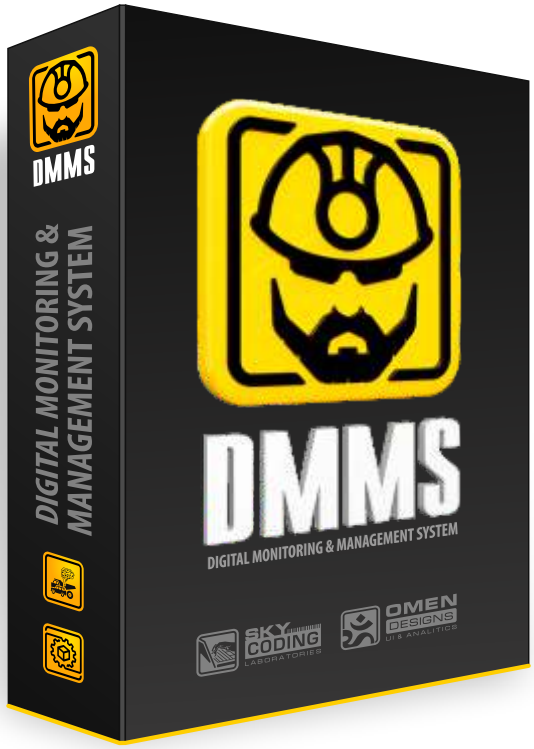

Recommendations and constraints:

Number of employees	500 - 100,000 people
Type of allowable areas to be equipped	Outdoor, indoor, and semi-open
Required number of RFID tags	500 - 100 000
Required number of base stations (BS)	50-5000
Server equipment	Required
Charging station equipment	Required
Power to the BS via PoE or 220V/5V	Required

Functional capabilities

DMMS SMART WATCH:

with a precise positioning module



- Online monitoring of the movement of personnel, equipment and inventory on the enterprise premises
- Monitoring close contacts of an ill person with other workers (0.5-3 meters)
- System access control and function managementvia NFC
- Personnel body temperature monitoring
- Tools for data analysis, Performance assessment and operational management decision making
- Detection of cases of sudden changes in the position of personnel (falls, device removal, etc).
- Extensive integration with most information systems for enterprises (ERP, 1C, BI, etc.)
- Monitoring vital signsPulse and body temperature.Maintaining a "Personal MED-CARD"

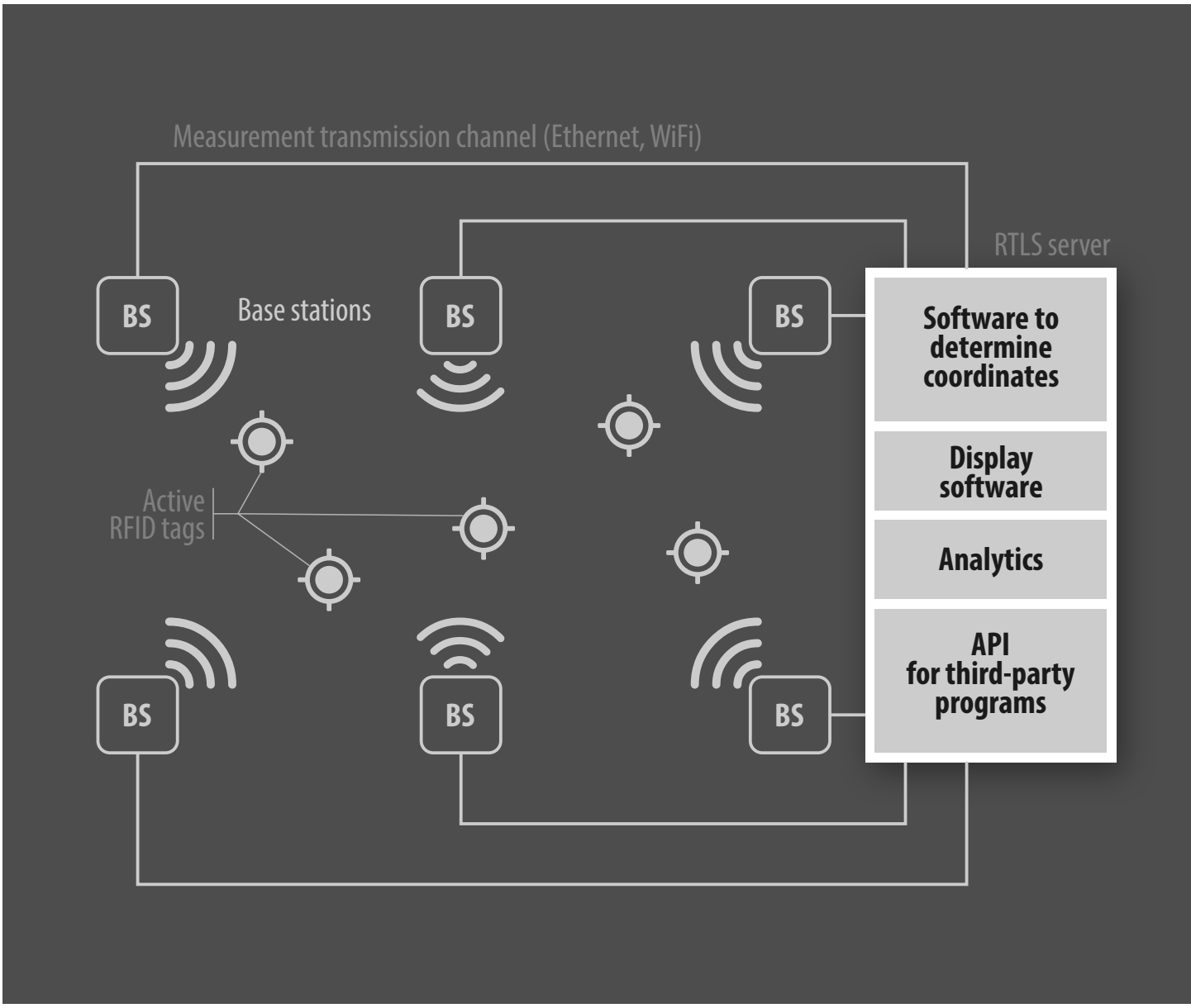
IMPLEMENTATION STRUCTURE

Base stations (BS)
located along the perimeter and, if necessary, within the perimeter of the site, at a distance of 25-30 m

GLONASS/GPS
in open areas where the positioning system is used

RFID SIGNAL
in the line of sight of at least four base stations, transmits coordinates with an accuracy of 10-50 cm

SERVER HARDWARE
The data from the base stations comes to the server for further analysis byother DMMS modules



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EQUIPMENT:

- DMMS SMART WATCH

- RFID tags for equipment

- RFID personnel badges

- Smart bracelet

Equipment functionality:

- Personnel location data transfer (a specific employee or group of of people) in real time;
- Positioning accuracy up to 0.5 meters;
- Data transfer to the smart watch: messages from the dispatcher, work orders, security alerts, emergency notifications;
- Feedback from employees: confirmation and rejection of tasks, change of statuses, data entry, request for help;
- Monitoring the time employees spend on premises (displayed in the DMMS module):
  - Generation of events in case of deviations;
  - Determination of the work routes for personnel;
- Generation of operational statistics and reporting forms on work and health status of personnel (displayed in the DMMS module);
- Sensors: NFC (for ACS), BAR (pressure), THER (temperature), HRM (heart rate), ACC (acceleration), GYRO (gyroscope), MAG (earth magnetic field).

Technical characteristics

- Battery life - 24 hours
- Wireless charging
- Fall protection from a height of up to 3 meters
- Dust and Moisture Protection Ip65

REQUIRED TECHNICAL EQUIPMENT:

- Wi-Fi/Ethernet PoE network
- Power supply to the BS (only for for WiFi variant) at the installation locations
- Charging post for RFID tags, badges and smart watches
- Server with specialized software
- Access to an electronic employee database and assignment of a personal Identification RFID tag and wristband

CHARGING STATION
for smart watches and badges

Integrating the RTTS system into the production cycle of the company

1 Each employee is assigned an individual RFID tag installed directly into the badge or in the form of a smart watch. The devices are designed to be worn during working hours only by the designated employee

2 There must be a charging station at the facility for recharging RFID tags and wristbands. The guaranteed operation period of the tag without recharging is about 2 to 4 months. (**In the case of integration with GNSS and the organization of the alert channel - daily recharging**). The recharging station can be installed in either in a personal dressing room, or a specialized recharging location convenient for the enterprise.The CHARGING POST distribute badges and smart bracelets at the beginning of the working day and will receive them at the end of the shift, placing them in a personal locker

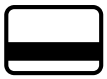
3 The dispatcher's workstation must be connected to the RTTS server in a single local network. Analysis of RTLS data is analyzed by means of the Web-interface

4 Data on movement, speed, time spent in certain areas (including dangerous areas), inventory and equipment, as well as the assessment of the integral activity of employees (according to the acceleration sensors) are sent to the server (MySQL database). From the server the data can be uploaded in any form and format convenient for the customer

SYSTEM INTERFACE

Continued development after the integrated application of the DMMS SMART WATCH-based system and base stations:

Anti-collision system and accident prevention based on UWB tags



Access cards and internal accounting system, payment in cafeterias, etc. based on the NFC module

Organization of an individual inventory issuance accounting system in the warehouse based on the NFC module

Employee activity Monitoring systemBased on an accelerometer

Monitoring the Presence of personnel in work areas using UWB tags

Tracking trends in metrics to predict the failure of a control node

Machine learning from accumulated big data and deployment of a neural network for thesubsequent increases in the degree of automation

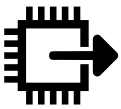
Building staff movement heat maps in work and non-work areas and evaluation of KPIs (requires additional UWB infrastructure)

Tracking the movement of inventory on the premises of the enterprise (additional UWB infrastructure)

Automatic notification of theOperator via e-mail, SMS, messenger a message in case of predefined event occurrence

Monitoring equipment operation (calculation of engine hours, assessment of residual life, Automatic spare parts ordering, etc.)

Maintaining a personal employee medical record



Plug-in any new sensors and other nodes without additional infrastructure costs

THE EXPECTED EFFECT OF IMPLEMENTATION:

1. Base stations of 500 units can provide coverage of an industrial site of up to 120,000 m^2 = approximately 15 soccer fields

2. On an open surface, positioning is provided by integration with GLONASS/GPS module. Accuracy in RTK mode up to 1 m, In standard mode up to 10 m

3. Comprehensive assessment of employee activity (a sharp decrease in activity during the day from the statistical average may indicate a person's state of health)

4. Continuous monitoring of the employee's body temperature during the day, achieved through the use of a built-in temperature sensor (optional on request)

5. Timely isolation of infected people and whom they contacted will help prevent mass infection of employees at enterprises

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