

INNOVATIVE AND
SUSTAINABLE SOLUTIONS
FOR SMART INDUSTRY

ons
FOLLOW THE RIGHT WAY

LIGHTING AS A NETWORK

ITS NOT ONLY ABOUT THE LIGHT ANYMORE.
ITS A NEW ERA OF COLLECTION AND DATA DISTRIBUTION.

LIGHTING AS

- infrastructure for connectivity and edge computing
- core IoT platform for SmartIndustry modules

VIA LIGHTING:

UNIFORMLY

located network in the industry place

SMART

network by lighting replacement

CONSTANT

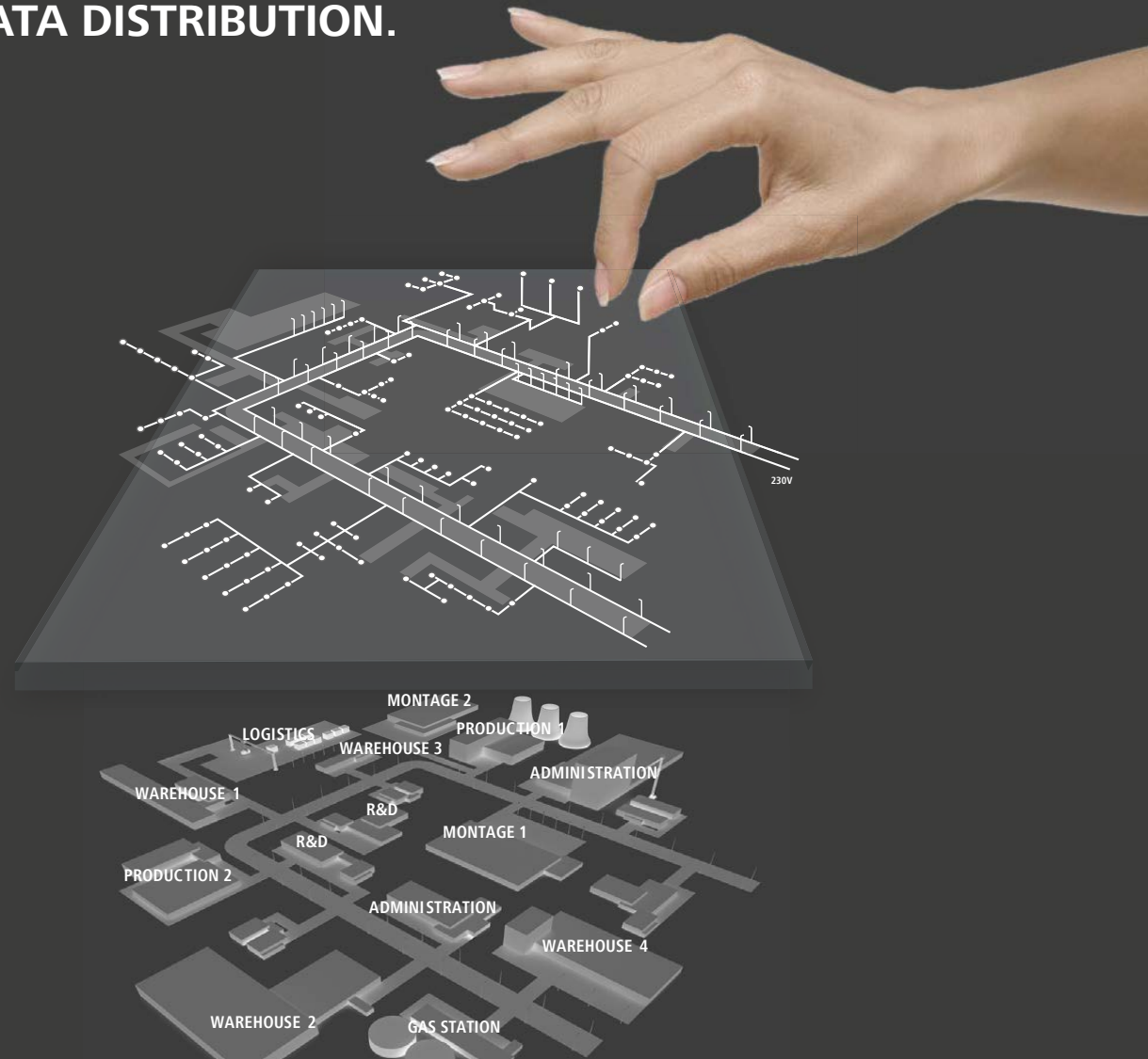
voltage available at 230V

SUITABLE

positioning at heights

SIMPLE

administration and maintenance



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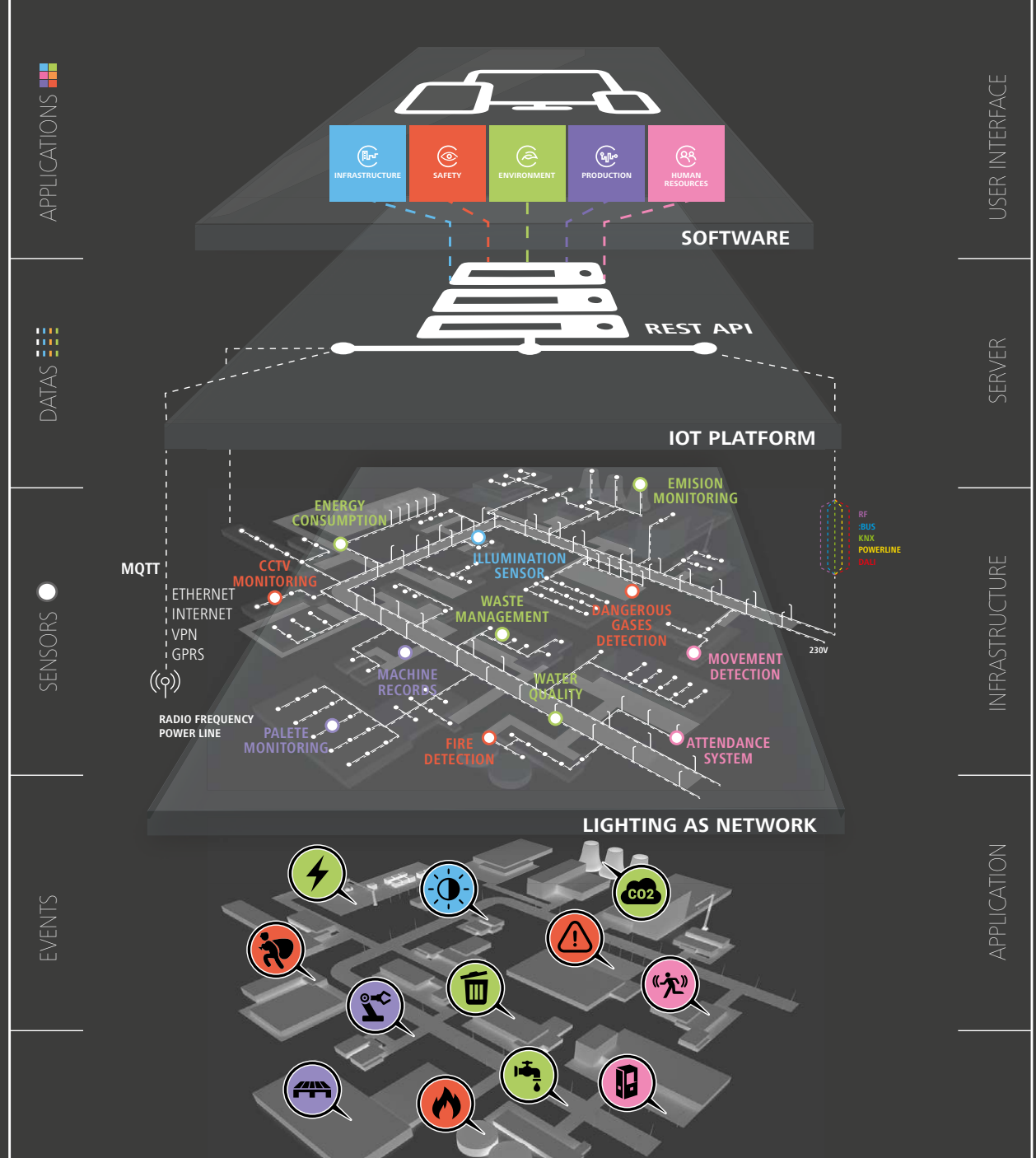
PLATFORM

WORKSYS AS

- application provider by customisation and re-use of existing data, components and visualisation
- open data provider by getting data through s and in Bigdata systems
- service provider by using open API s from 3rd party applications and systems
- marketplace or ecosystem based on ability expand through partner's solutions



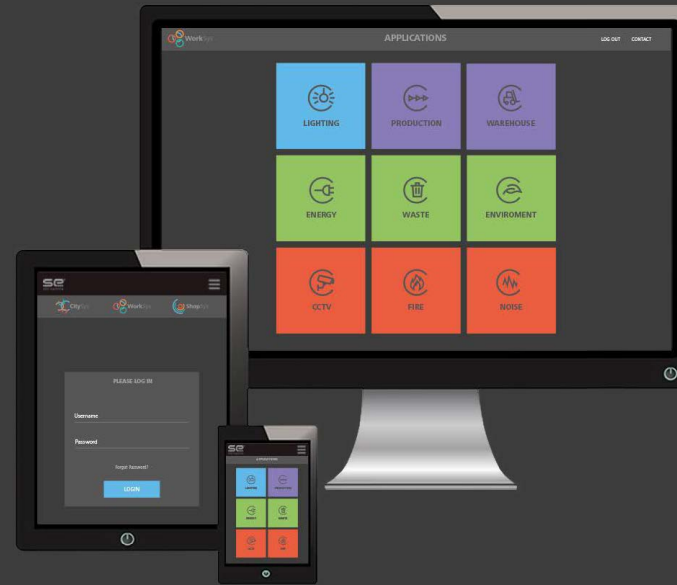
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SOFTWARE

The Lighting module provides access to the management and monitoring of industry lighting where the implementation of specific operations is made via modern widgets.

This means that the module is summarised in 5 chapters - CONTROL, DATA, OPTIMISATION, PREDICTION and MAINTENANCE.



CONTROL

PREDICTION

DATA

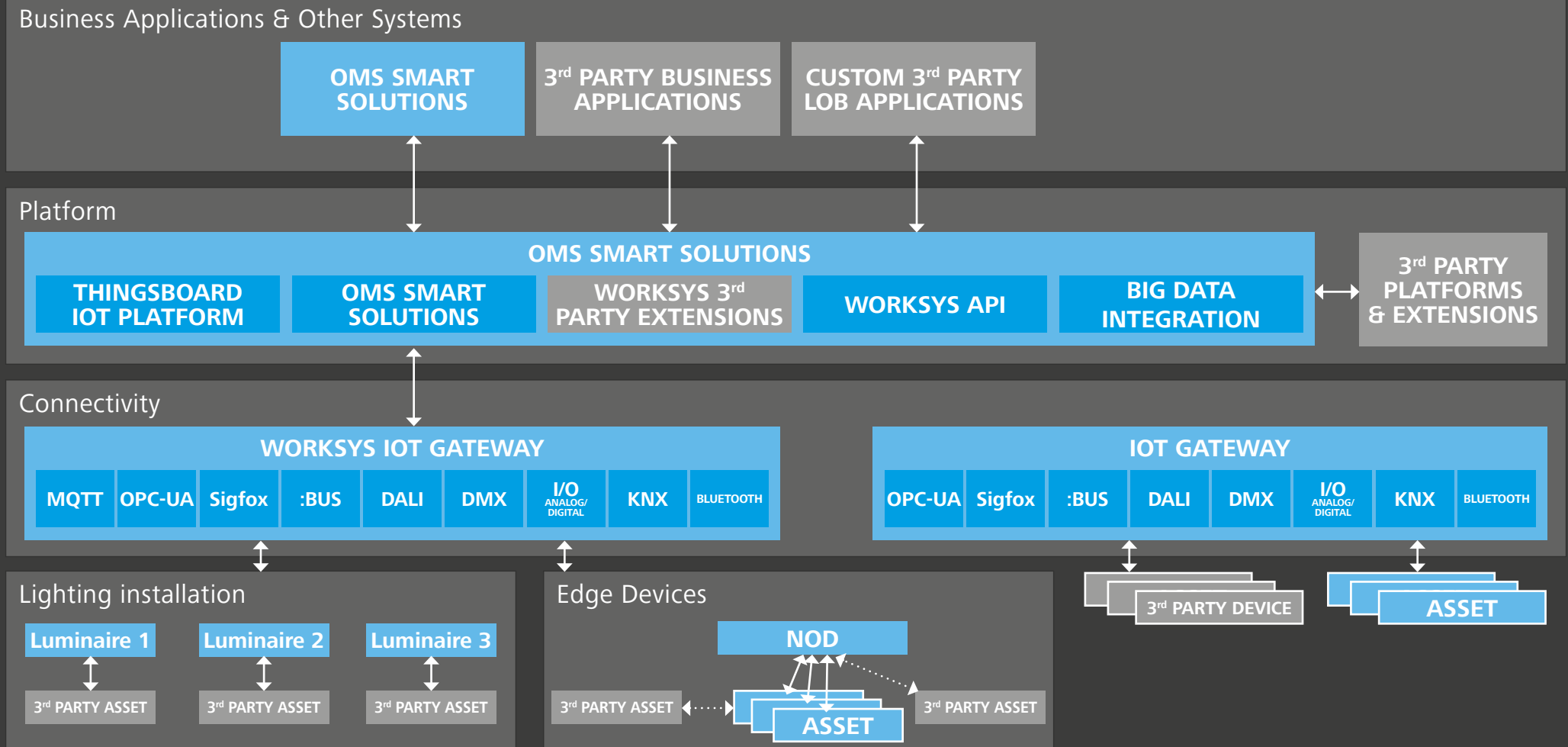
MAINTENANCE

OPTIMISATION



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ARCHITECTURE



PLATFORM FUNCTIONALITY

Device and Asset Management

- Management of physical devices
- Modelling of the real world and its devices
- Expanding data structures with special objects

Rule Engine and Plugins

- Data processing and its storage
- Ability to respond by email or SMS to events that are triggered
- Ability to call remote service using standard protocols (MQTT, AMQP, REST, RPC)
- Ability to call another device using a rule or other device
- Ability to redirect data to any Bigdata platform

Data visualisation

- Ability to visualise captured data and sensor data using built-in dashboards and pre-loaded widgets
- Ability to visualise the data of stored objects that extend the schema of stored data
- Possibility of mating a dashboard for end customers from the tenant level
- Ability to extend programming of widgets

Scalability, performance and maintenance

- Robustness, scalability and platform deployment
- Horizontal scaling support (Apache Zookeeper)
- Ability to insert platform into cloud even to local IT infrastructure
- Fault-tolerant, i. no single-point-of-failure, every node in the cluster is identical

User Management

- Multi-tenant support - the tenants of the platform are able to operate with separate administration (device management, rules, plugins, ...)

Data and Platform

- Support for reading and writing data into platform objects through REST and MQTT (equipment, asset, etc.)
- Asynchronous Read Data Support (Websocket)
- Remote call capability (including bulk), platform object management (creation, modification and deletion of devices, group of devices and assets, etc.)
- Ability to integrate business applications and third-party GUIs

Open and Microservice Architecture

- Openness of the platform in terms of its connection to other systems, e.g. Bigdata
- Openness of plugins creation and platform extensions

Extension

- Support planning and management of IoT installation projects
- Support user logging and its visualisation
- Mobile application for lighting installation and management
- Reporting

BENEFITS

AUTONOMY: Exclusion of the human factor. Full automatic control system.

ENERGY SUPPORT: water, electricity, gas, heat.

RENEWABLE ENERGY MANAGEMENT: wind energy, solar energy, ...

COMFORT: simplification of the control by using intuitive operation elements.

MONITORING: full monitoring (production processes, maintenance, safety, HR, material).

OPTIMISATION: Automatic search for the best solutions.

RIGHTS: User logins and creation of functional models and solutions.

WorkSys IoT gateway

ANY CONNECTIVITY: easy integration of devices connected to legacy and third-party systems using existing protocols,

OUT-OF-THE-BOX SUPPORT: connect to your OPC-UA server, MQTT broker or Sigfox backend.

WorkSys remote controller

ONSITE: edge remote controller ready for connectivity failure and time critical scenarios,

OPEN: linux-based system open for 3rd party integration,

SECURE: crypted communication and controller consistency checks



CONTROL SYSTEM



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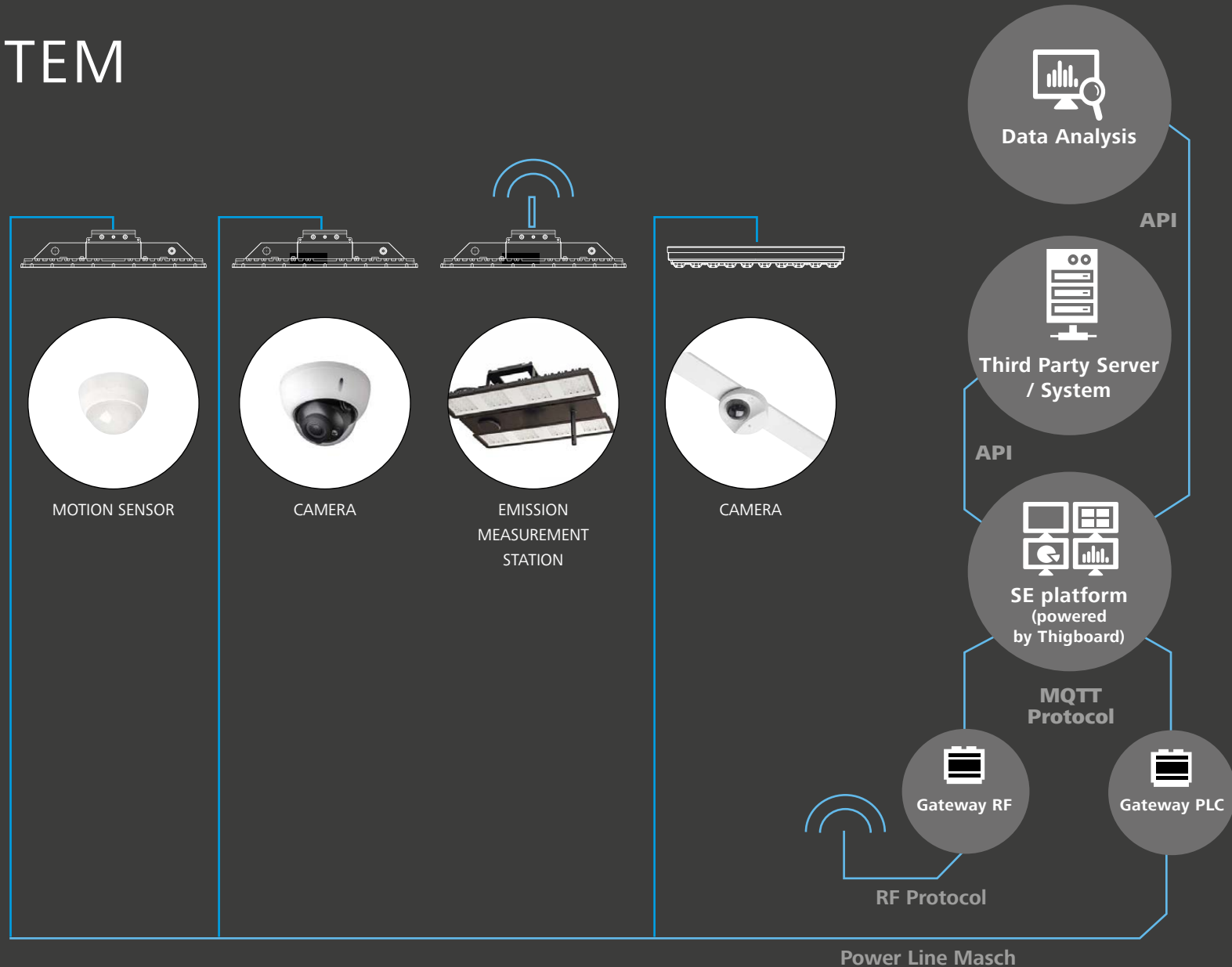
CONTROL SYSTEM

LIGHTING GRID AS COMMUNICATION BUS

Lighting grid based on PLC or RF communication is used as a communication bus for all connected IoT smart devices.

Lighting grid will be like communication highway for smart devices.

Luminaires exist as an independent ones or as a rail system.



CONTROL SYSTEM

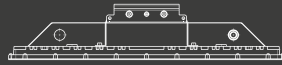
LUMINAIRE PERIPHERAL DEVICES

Our IoT Luminaires are available also in combination with motion sensor:
Built-in / External

In both ways, settings of motion sensor are available in WorkSys system.

We can also prepare IoT Luminaire in combination with videocamera. Streaming of the video will be directly in Luminaire screen.

Powerline communication enables video stream directly from camera.



CAMERA

Camera can be useful not only for a screen scanning and history creation, but for the video analysis, too.



MULTISENSOR

(MOVE DETECTION, ILLUMINATION SENSOR)

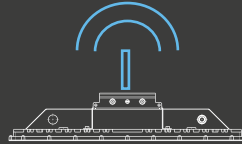
Movement sensor is used for light control and information collection, which are recorded and evaluated (when the movement was detected, for how long, how often,...)



CONTROL SYSTEM

LUMINAIRE PERIPHERAL DEVICES

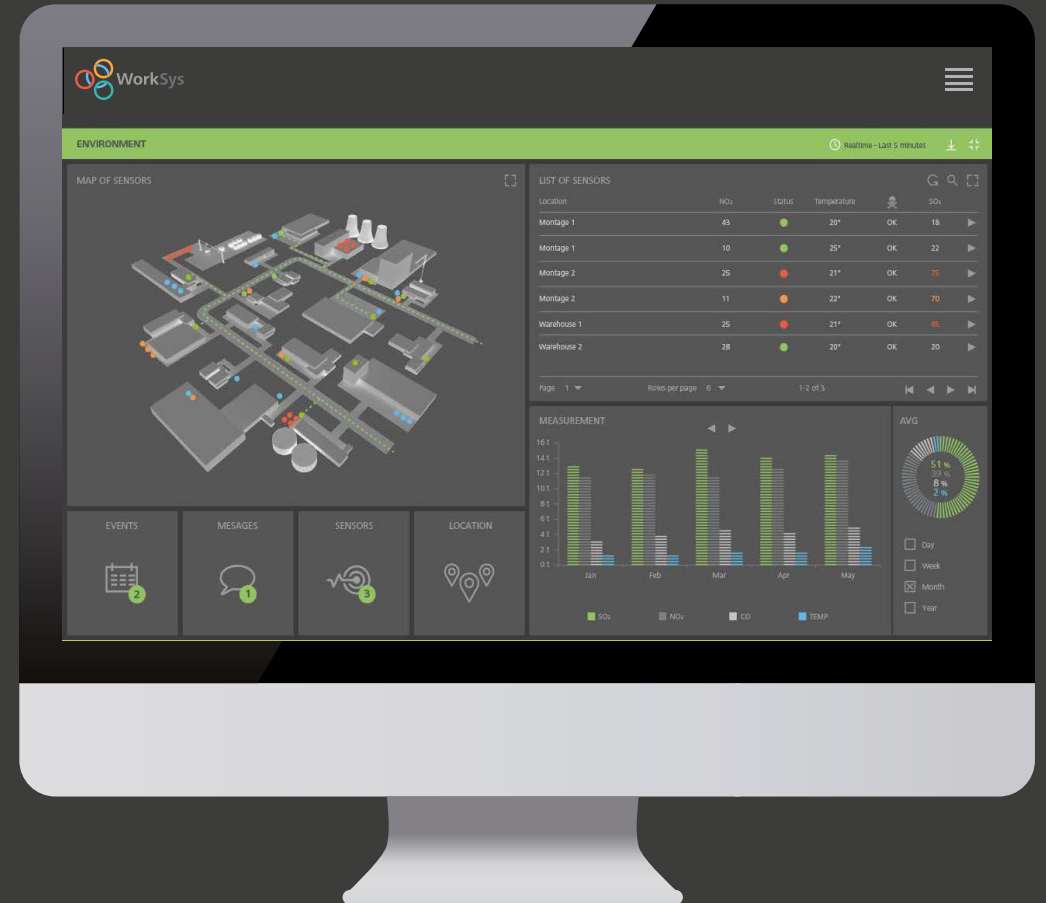
Our IoT Luminaires can be prepared in combination with emission measurement station.



EMISSION MEASUREMENT STATION

In the WorkSys you will have overview of all available emission measurement station values and measurements.

- Temperature
- Dangerous gases
- CO₂
- Wind speed and direction
- Humidity
- Dust
- Radiation



CONTROL SYSTEM

GROUPS OF LUMINAIRES

You can assign Luminaires into the groups.

In the map you can select visualization of Models and finally you will see points in belonging color.



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CONTROL SYSTEM

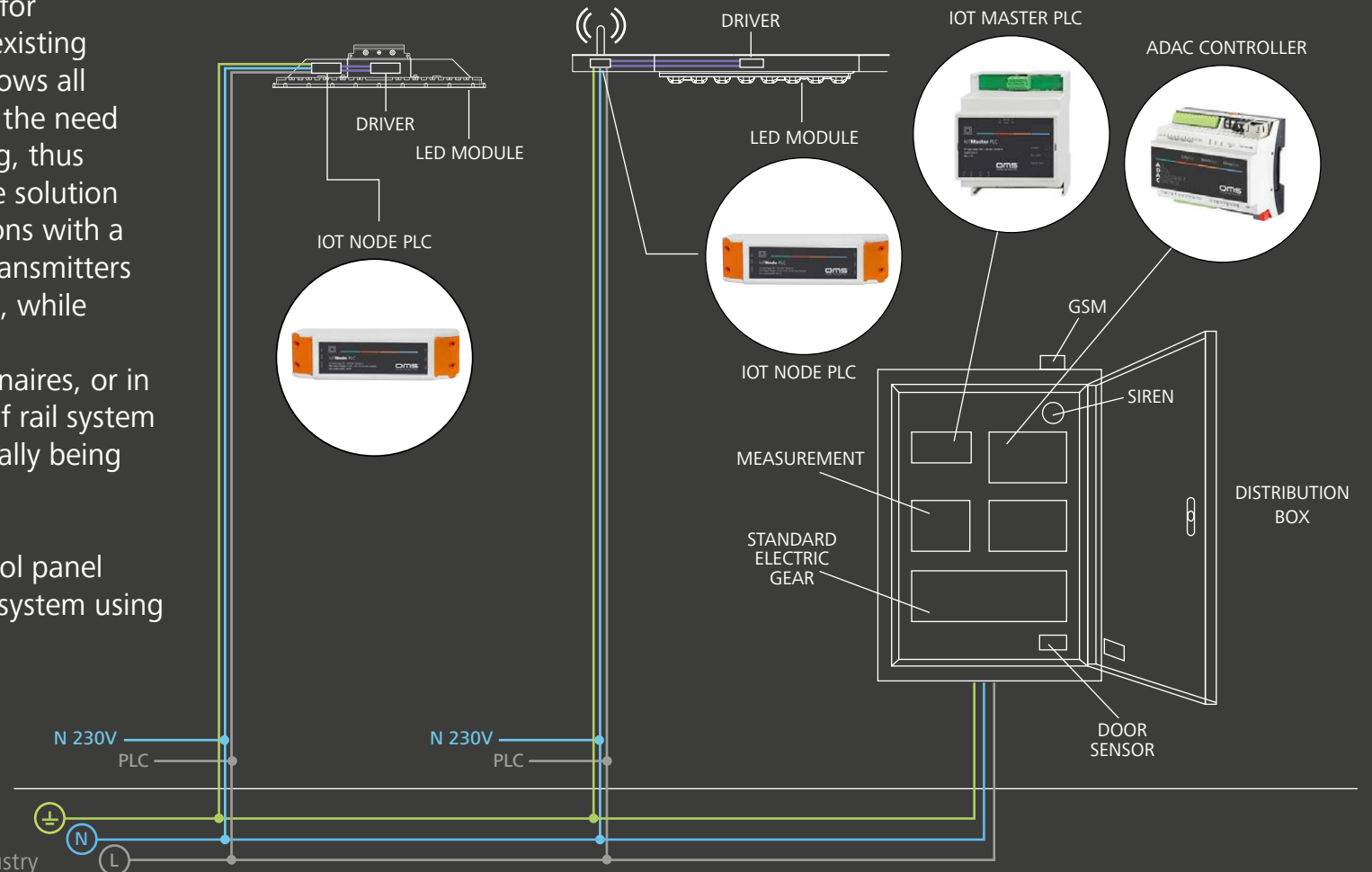
POWER LINE COMMUNICATION

Choose Power Line communication for control that is facilitated along the existing power supply infrastructure. This allows all communication to be done without the need for additional control lines or cabling, thus minimising reconstruction costs. The solution is ideal especially for older installations with a limited number of phases. Special transmitters are located in the distribution boxes, while receivers are within the luminaires, if we talk only about the single luminaires, or in case there is a receiver at the start of rail system in which DALI collector is automatically being implemented.

External movement sensors or control panel buttons can be implemented in the system using the same way.

VAR.A
PLC MODUL
IN INDEPENDENCE
LUMINAIRE

VAR.B
PLC MODUL
IN CONTINUOUS LINE
SYSTEM



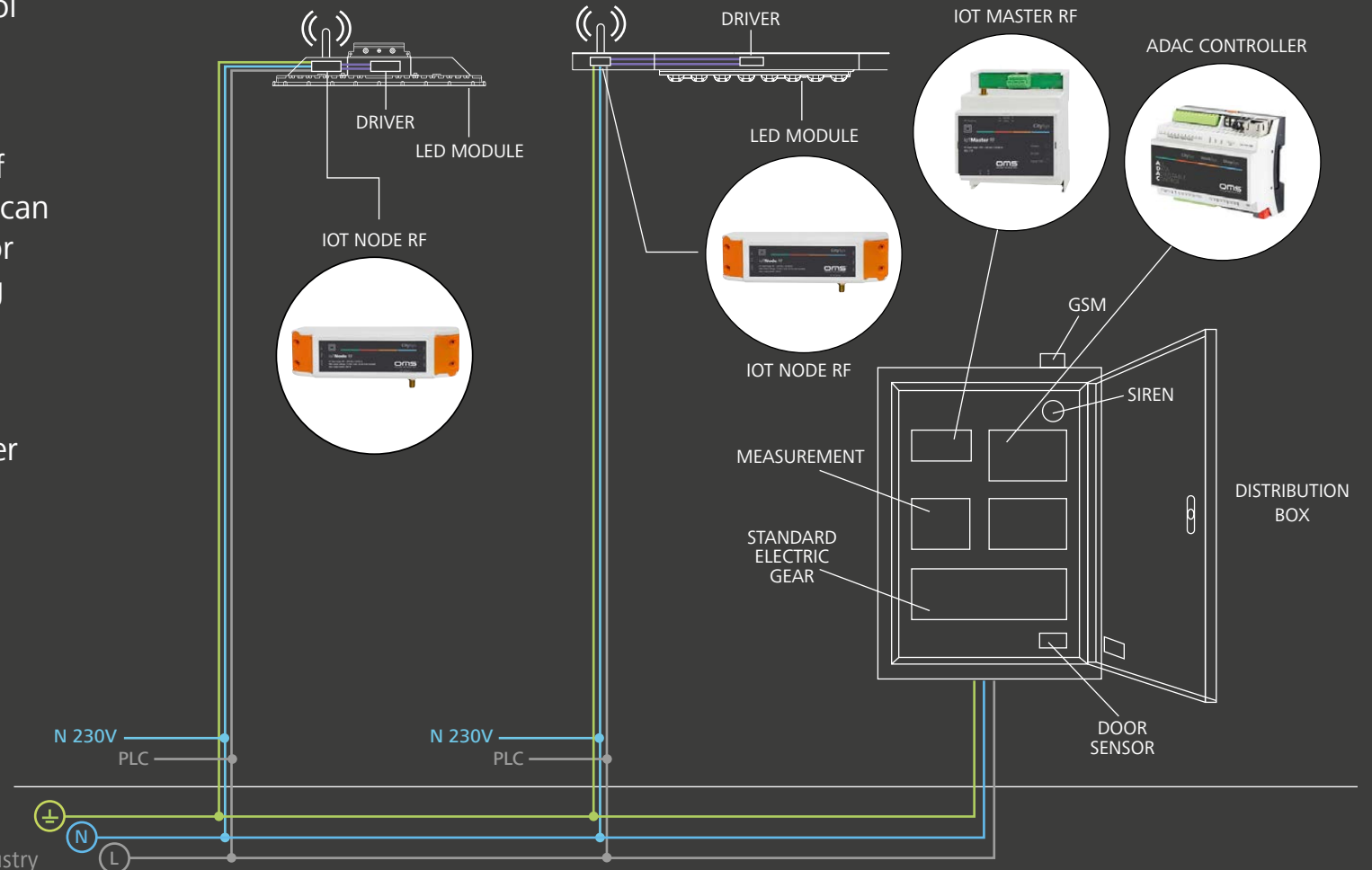
CONTROL SYSTEM

RADIO FREQUENCY COMMUNICATION

With RF communication all control commands between the central control unit and the luminaire are sent using radio frequency. This allows minimising the cost of installation, plus lighting systems can be reconstructed without need for replacement or addition of wiring infrastructures, nor investment in control line cabling. It also means that no fees need to be paid for the transferred data, which further reduces operational costs.

VAR.A
RF MODUL
IN INDEPENDENCE
LUMINAIRE

VAR.B
RF MODUL
IN CONTINUOUS LINE
SYSTEM



CONTROL SYSTEM

IOT FOR LIGHTING

ADAC controller is your easiest way to program complex logic in KNX/EIB, Modbus, BACnet, EnOcean and other networks. Controller will enable you to efficiently customise building automation processes, easily delivering unlimited flexibility benefit to end users in a cost-effective way.

ADAC controller is an embedded platform with integrated Ethernet, USB, GSM, Serial interfaces and I/O ports. Allows to use it as cross-standard gateway, logic engine, visualisation platform, IP Router. Scripting templates provides user-friendly, flexible configuration interface and integration with cloud/web services, 3rd party devices. Via applying custom scripts can simultaneously act as thermostat, security panel, lighting controller, etc.



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- Logical functions
- WEB SCADA visualisation for PC and touch-devices
- cross-standard gateway
- integration with third party devices over USB, RS485 serial port, Ethernet - AV, IR, HVAC
- Data logger with trends
- Presence monitoring
- Lighting regulation
- Universal controller (lighting, shutter etc.)
- Health/activity monitoring
- Internet-of-Things
- Cloud server/client
- Energy metering

CONTROL SYSTEM

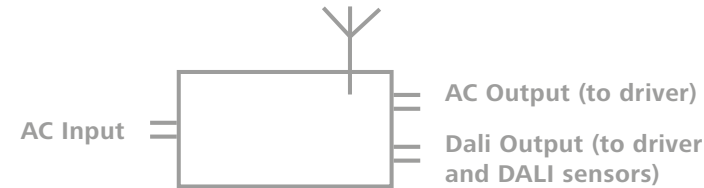
IOT NODES PLC /RF

- Modular communication interface
 - PowerLine
 - and RF (Bluetooth Mesh)
- Control of the DALI driver via DALI interface – internally powered (max. DALI current 30 mA)
- Communication with external DALI sensors - environment, movement, ambient light...
- Internal relay for mains output switching
- On-board sensors of inclination and vibration (detection of hit)
- Power measurement of connected DALI driver or other non-dimmable luminaires
- Internal clock - time schedule function
- Fault reporting
- Back-up battery for clock and data
- Remote update of Firmware
- Storage of GPS location

IOT NODE RF



ANTENNA (BLUETOOTH version)



AC input range:	90 – 250 VAC / 50-60 Hz
DALI output voltage:	15 VDC / max. 30 mA (non-isolated)
Max. output power:	300 W
Power measurements:	Voltage, Current, Power, Frequency, cosPhi, Energy
Accelerometer:	Inclination measurement, shock detection
Max. communication range	
Powerline:	< 500 m direct connection, < 5 km with mesh
Bluetooth Mesh:	< 100 m between nodes

CONTROL SYSTEM



IOT NODE PLC

- **Standard version** in plastic enclosure
- RF version requires external antenna
- Support for external sensors
- Mains input: Lin and Nin
- Main output: Lout and Nout
- DALI output:
 - internally supplied
 - interface to DALI driver or DALI sensor
- Simple integration inside luminaire



IOT NODE PLC IP

- **External version** in IP65 enclosure
- Mains input: Lin and Nin
- Main output: Lout and Nout
- DALI output
 - internally supplied
 - interface to DALI driver or DALI sensor
- Extension suitable for standard luminaires
- Installation on pole

CONTROL SYSTEM

IOT MASTER PLC / RF

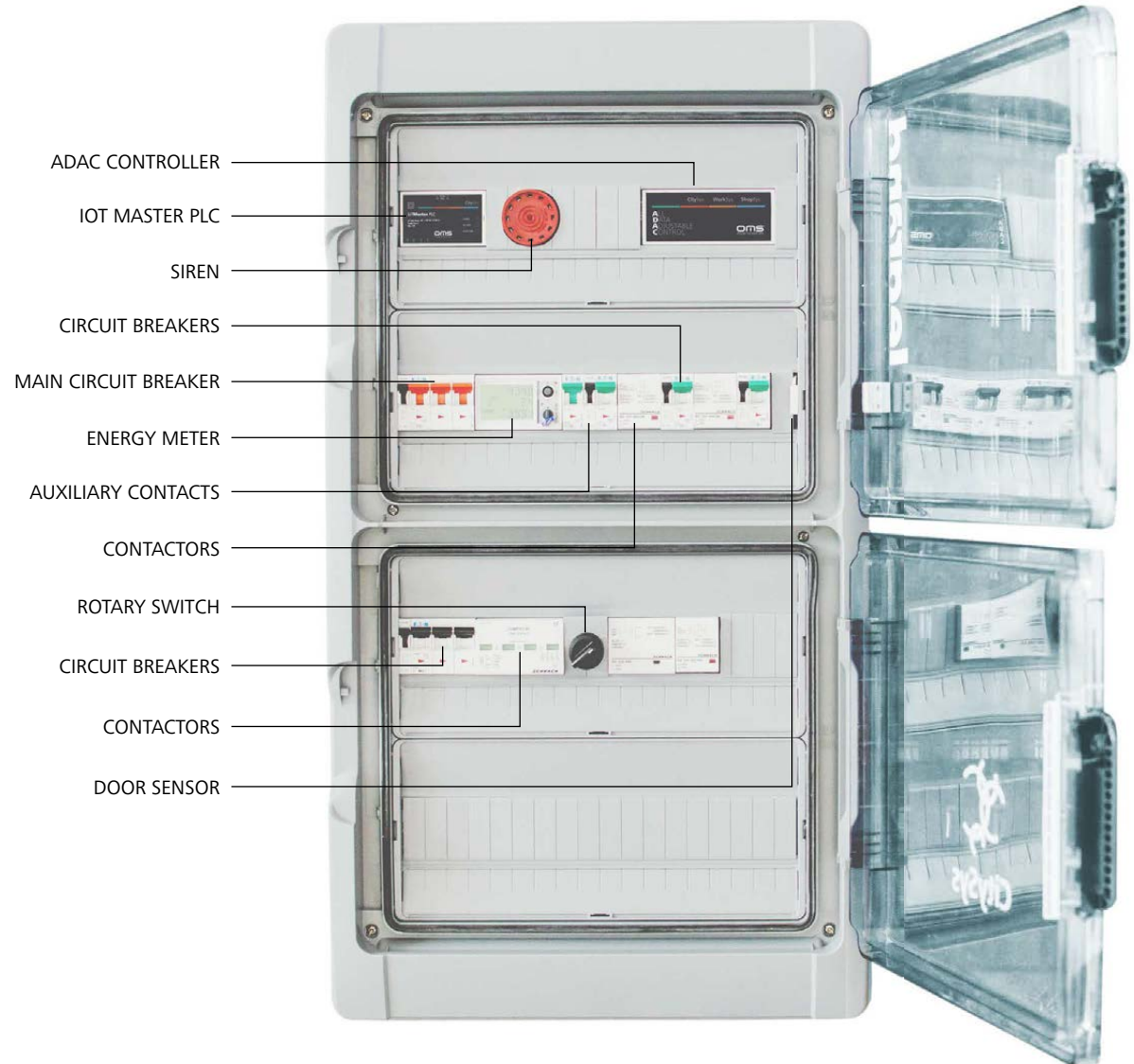
- Communication gateway between ADAC and IoT Nodes
- Serial communication with ADAC – RS232
- Provides reliable and secure communication on RF and PLC: AES-128 encryption
- 3 phase support for PLC
- Up to 128 IoT nodes
- Integrated vibration sensor for hit detection
- Support for remote FW update



CONTROL SYSTEM

ELECTRIC DISTRIBUTION BOX

- ADAC All data adjustable controller. It serves like integrator of all connected components into WorkSys. It harvest all data and send it to the server for processing.
- PLC/RF Master Node. Is responsible for PLC or RF communication.
- Energymeter provides measurement into the WorkSys.
- Auxiliary contacts. They sending information about position of circuit breakers.
- Rotary switch switching between modes (Automatic, Manual and OFF)
- Siren. In case of unauthorized entry siren starts to make noise.



SOFTWARE APPLICATION



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SOFTWARE APPLICATION

ENABLE CONNECTIVITY & HOSTING

- Simply add secure connectivity and hosting over the air.
- Connect just one luminaire, one group or all luminaires.
- Enable inter-cloud-WiFi connection between selected sustainable luminaires,

SOFTWARE

- We offer a variety of smart services, cloud portal and applications, which can be added anytime, without any additional installation efforts.
- Customers can also add third-party solutions as needed, or even develop their own applications. New sensors can simply be connected.



SOFTWARE APPLICATION

CENTRALISED MONITORING & DISPATCHING

Data from whole Industry will be harvested into one system and service team needs to have real information in case of some troubles with Lighting, Security, Production, Logistic, Waste ...

For smooth and reliable operation of the Industry is necessary to prepare Dispatching.



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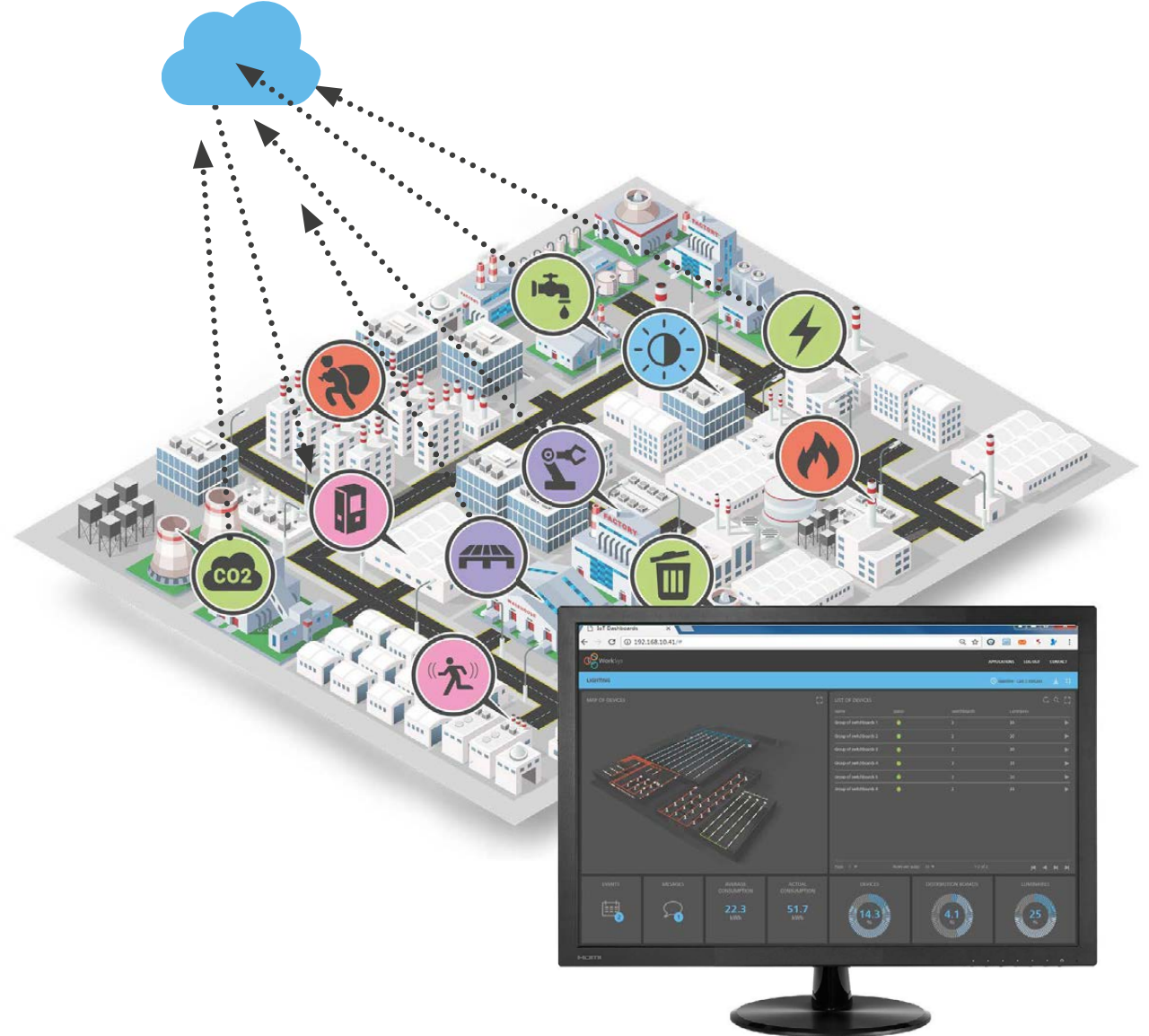
SOFTWARE APPLICATION

BULK ACTIONS

This special widget gives overview of all devices in the Industry. Using filters you can see device type which you want to see. In combination with Virtual points Industry technical service can see how far Industry reconstruction is. By clicking on specific device, map will be zoomed and focus on this point.

You can change map visualization based on bookmarks (Cabinets, Profiles, Dimming, Model, Groups). Points on the map will be the same color like you set on screens belong to them.






Bookmark - Smart Industry Devices – will come soon and brings Smart devices counter functionality. Devices outputs from one module could be used as a trigger to another module. For example Traffic sensors from module Traffic can affect light level on luminaires in Lighting module.



SOFTWARE APPLICATION

INTEGRATION MAP

WorkSys is an open platform integrating multiple applications and together creating a smart industry.

MODULES	APPLICATIONS				FUNCTIONALITY
 INFRASTRUCTURE	Lighting management Monitoring Movement detection Lighting scenes TW, Daylight Alerts Schedulers, Reports	Energy Saving Smart grids and metering utilities (Electricity, Water, Gas)	Asset management	Facility management Management Monitoring Planning Reports	
 SAFETY	CCTV monitoring Safety and security Control and monitoring Video image analysis	Fire detection Escape routes Fire protection systems Automatic emergency rescue call Evacuation	Dangerous gases detection Monitoring the leakage of hazardous gases, Reporting faults	Noise detection High noise level Wear of machines	
 ENVIRONMENT	Waste Solid Waste Water Waste Chemical Waste	Air Quality Pollution CO2 Pollen	Emissions Air care Environmental data Analyse status of the plants	Water quality Quality monitoring (input/output) Service water Technological water	
 PRODUCTION & LOGISTIC	Production flow monitoring Monitoring the movement of materials and products within the production process	Machine records Predictive maintenance Digitisation and use of data Data collection from production lines	Storage management Space management Time management Disposition overview Palette monitoring	Logistics and Export Traffic monitoring	
 HUMAN	Information system Company Information Production Information (Safety, Defectiveness ...)	Attendance system Employees monitoring Attendance system Visits monitoring (VIP, suppliers, truckers...)	Employees monitoring Input information from employees to employer		



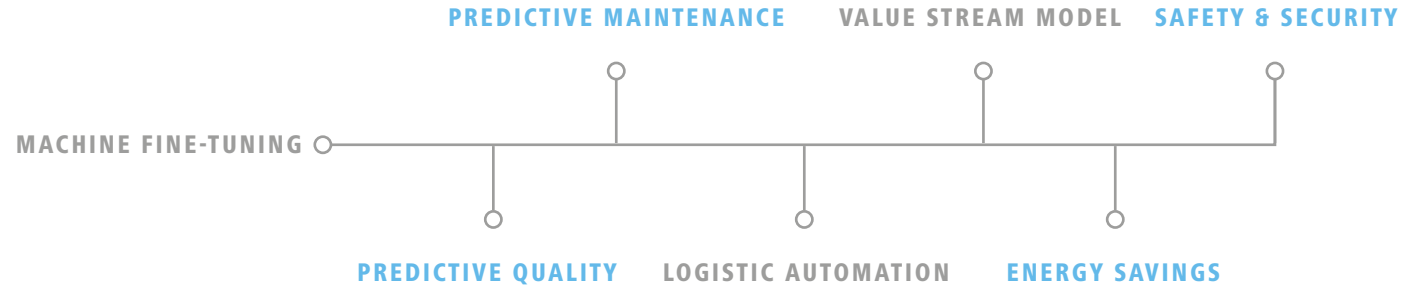
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SOFTWARE APPLICATION

Interconnection of single control units, collection and distribution creates complex coverage solution in three-dimensional space.



DATA ANALYSIS



MACHINE FINE-TUNING

Increase the OEE of your equipment. Finding the optimal settings and process window to minimise the scrap rate. Potentially leading to a zero-scrap rate.

PREDICTIVE QUALITY

Spot the quality risks as soon as possible. Predicting the risk of decrease in quality of the production. Typically using machine data, location data and other factors.

PREDICTIVE MAINTENANCE

Don't waste time and resources for out-of-order equipment. Automated assessment of the condition of the in-service equipment. Algorithms are accurately detecting the risk of failure using machine records and external environment data like noise, temperature or humidity.

LOGISTIC AUTOMATION

Improve the efficiency of logistics operations. Govern the internal logistics using data about movement of materials and products together with space utilisation data from logistics nodes to ensure the right amount of traffic through the whole network.

VALUE STREAM MODEL

Get insight into the complex system. Digital twin of the whole factory identifies waste in the production process. Are the workers moving efficiently? Does the environment support the productivity? What machine, which work shift, what production step is worth focusing on.

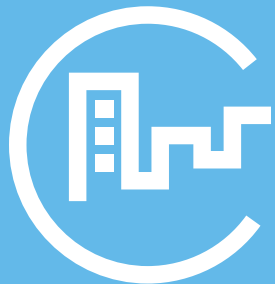
ENERGY SAVINGS

Save costs without compromising productivity. Prediction of energy consumption ensures the lights are on and the machines are running only when needed. Potential to save 10-20% of electricity costs.

SAFETY & SECURITY

Ensure autonomous warning system is in place. AI performs automatic anomaly detection and assess risk of potentially dangerous situations. Also, visual object detection may be implemented in order to ensure critical objects recognition or tracking.





INFRASTRUCTURE

LIGHTING
ENERGY SAVING
ASSET MANAGEMENT
FACILITY MANAGEMENT



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INFRASTRUCTURE

LIGHTING

INTEGRATION MAP



Gateway
RF



Data Analysis



SE platform
(powered by Thigboard)



Third Party Server
/ System



Gateway
DALI

RF Protocol

DALI Protocol

Sensor without
Luminaire

DALI
Sensor

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Sensor inside
Luminaire

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Sensor

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INFRASTRUCTURE

LIGHTING

BASIC OVERVIEW OF THE SYSTEM

Screen Widgets

a) The map contains displayed entities:

- EDBs (Electrical Distribution Box)
- Luminaires
- Devices

b) Notification widget "Events"

c) Notification widget "Messages"

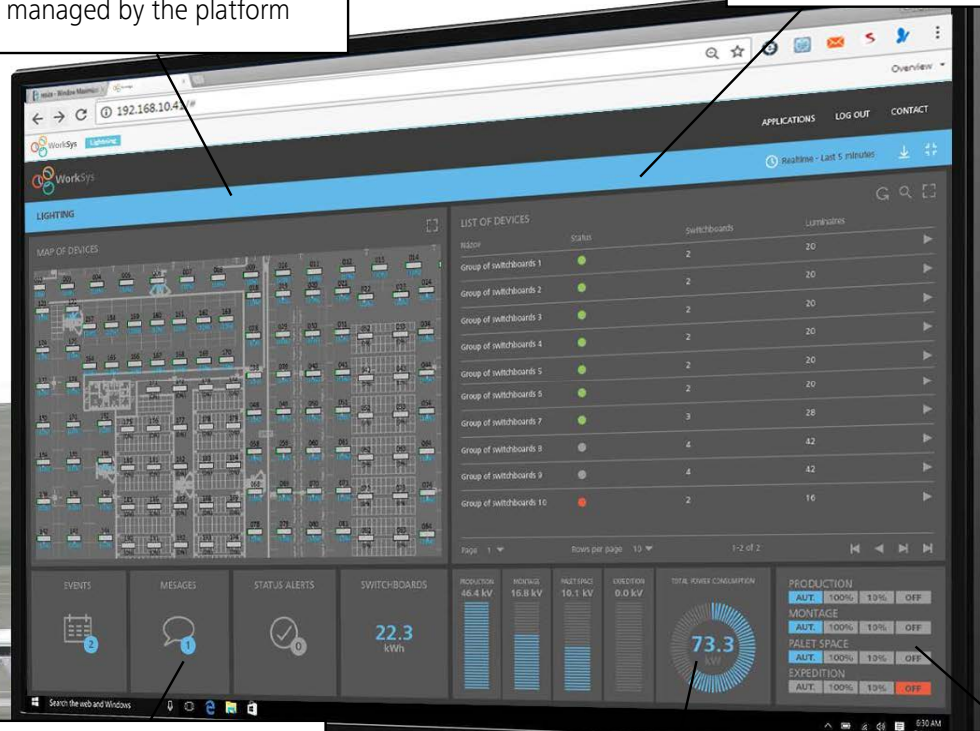
d) Widget "Measurement" containing the following measured quantities

Functionality:

- the ability to set the full overview of GUI
- the possibility of creating individual widgets
- creation of review statistics
- Device monitoring

Basic overview (dashboard)
of the status of each device managed by the platform

LIST OF DEVICES



Information section about events and failures
with a quick look

Control panel
The ability to control online lights and select a mode (central or individual groups)

Information section about consumption



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INTERACTIVE LAYOUT

An interactive layout preview is displayed at all viewing levels.

User possibilities through map usage:

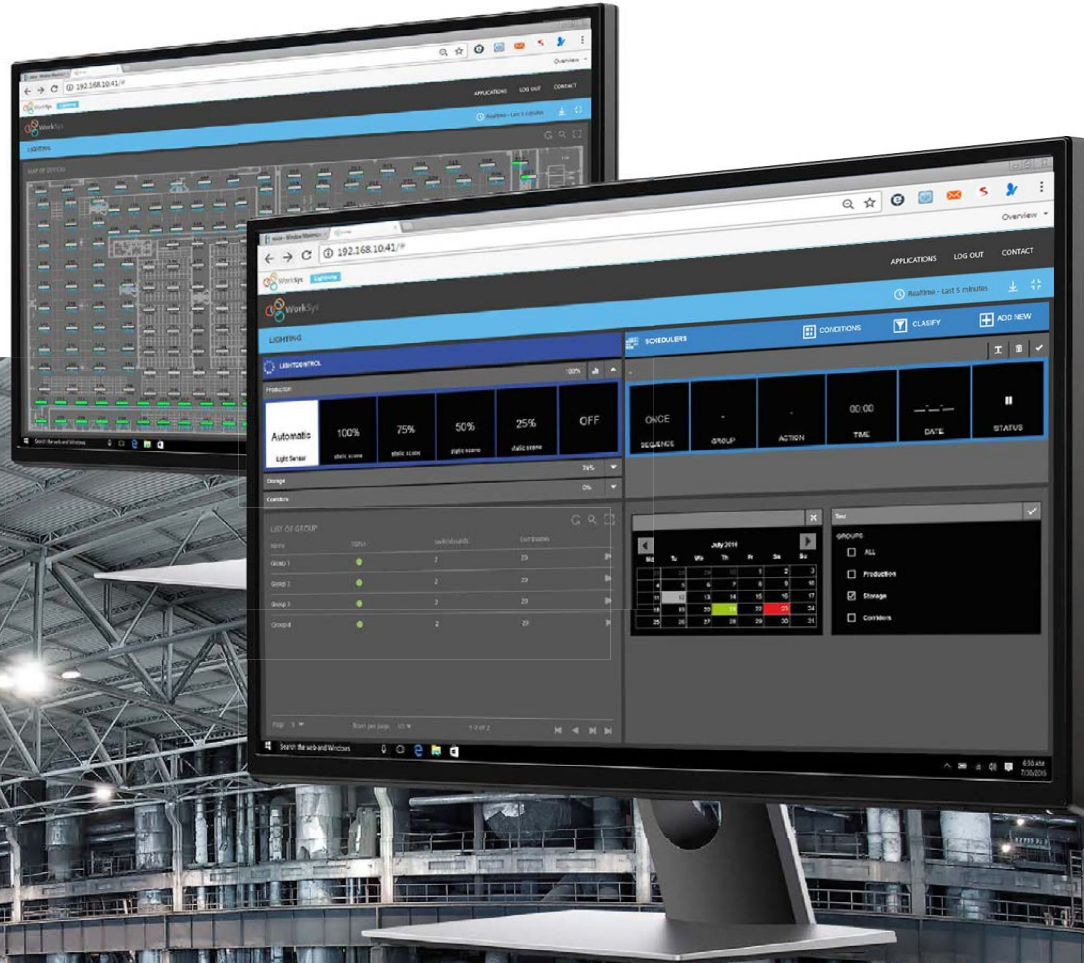
- Edit view (move, zoom in and out of view),
- Choose which devices will be displayed,
- Add Virtual Points to the system,
- Mark the devices to see their details,
- Monitor device status,
- Create device groups



OVERVIEW OF GROUPS OF ELECTRIC DISTRIBUTION BOX

FURTHER BENEFITS:

- Access the system from a computer, tablet, or smart phone
- Detailed overview of all information about each luminaire, current settings and measurements.
- Automated data collection reduces maintenance costs
- User-friendly remote and local control provides great autonomy
- Assessment of energy saving reports



ALERT MODULS

Screen Widgets

- The map with actual position of luminaire
- An real time visual indication of defective lamp / Lamp lost
- The structured history of faults
- An Email and SMS notification
- The creation of detailed report of solid faults

Functionality

- Overview of lighting system
- Fast evaluation of faults and its correction

Details

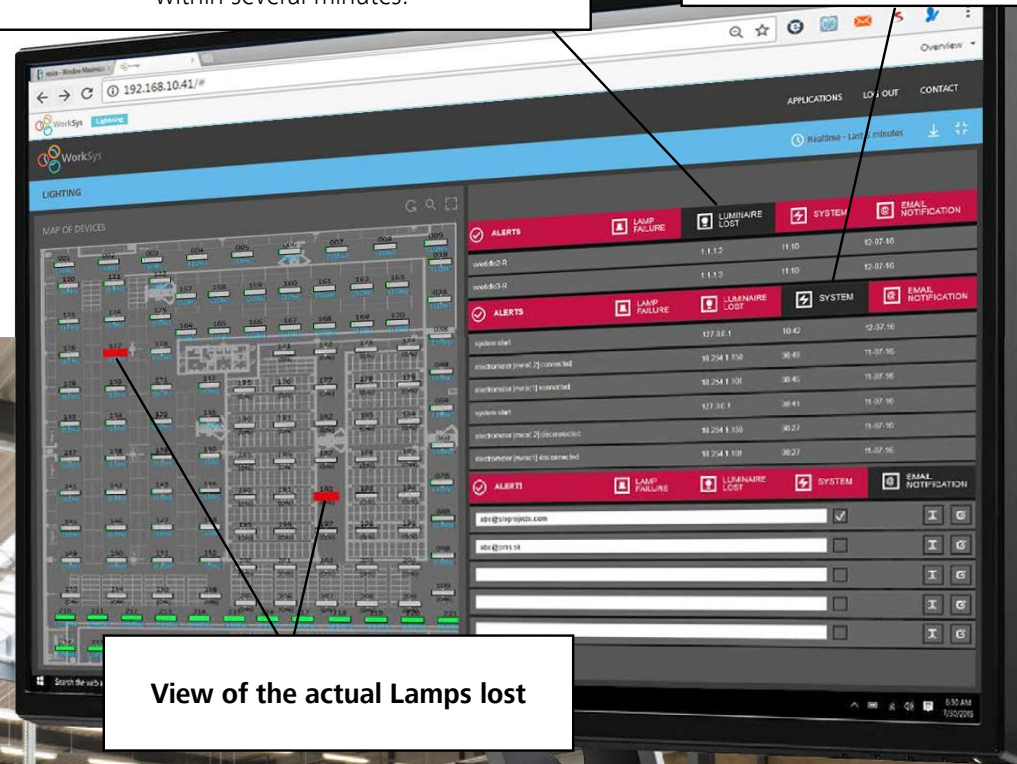
- Error notification of lighting
- History of lamp repairs/changes
- Notification of lighting and system faults

Lamp failure / Lamp lost

If the system detects a failed light source, the luminaire will be added to the cell "Lamp failure / Lamp lost" with a specific date and time. Once the problem is resolved, the notification will disappear within several minutes.

Errors list

You can see the last data entries about system activity and errors.



View of the actual Lamps lost

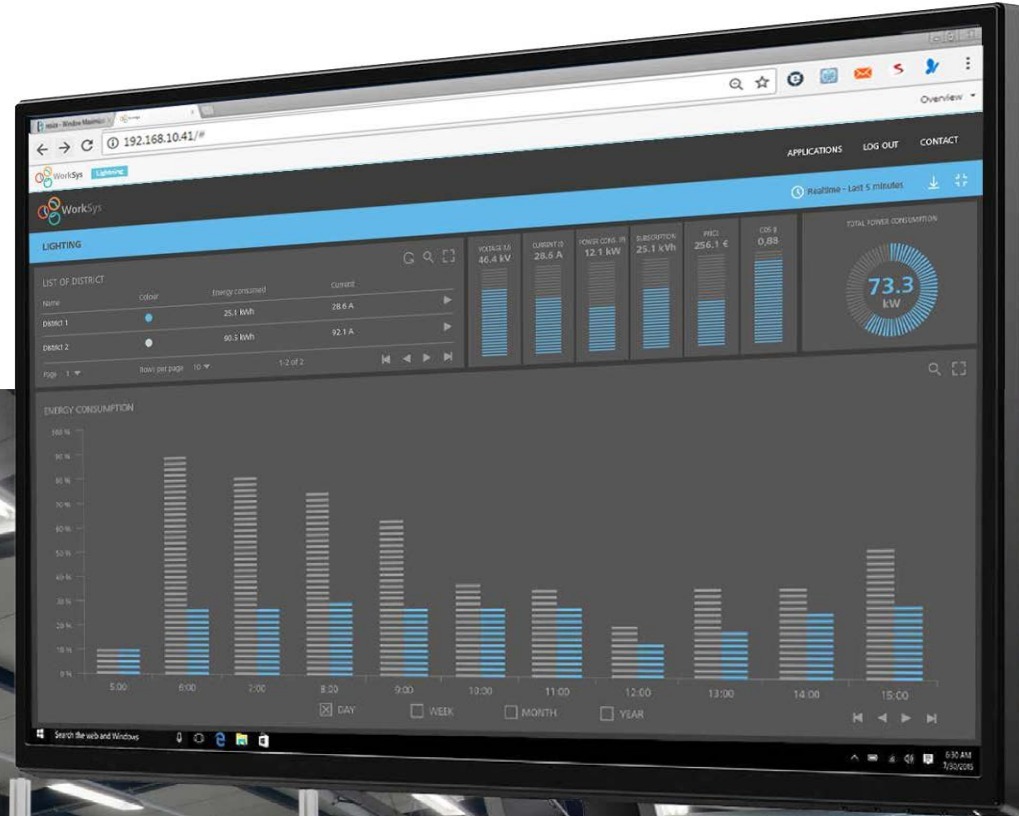
ENERGY MONITORING

Consumption

The energy consumption of selected units which can be daily, weekly, monthly or annually logged. The monitoring of the several EDBs, power consumption, voltage, current, and the power factor (can all be included in reporting).

Saving

This information about consumption based on customised logs, can be compared against the maximum expected usage. The system includes a module for converting consumption savings directly into a monetary value, thus indicating quickly savings made on the installation investment (energy prices must to be predefined).





INFRASTRUCTURE

LIGHTING

EVENTS - ALERTS - REPORTS

EVENTS

- For devices and groups of devices
- Record activity of all users with specific time - Check (Surveillance)
- Impact of user authorisation level

ALARMS

- For devices and groups of devices
- Recording and archiving of issues and error messages
- Fault Troubleshooting Management: the occurrence of a disorder, associating the problem to a specific user, Duration of troubleshooting
- Duration of failure

REPORTS

- Report maintenance- Measurement reports
- Daily, Weekly, Monthly
- Download the necessary parameters into the Report
- Send to email and sms
- Possibility to download report in XMLS format
- Impact of user authorisation level



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INFRASTRUCTURE

LIGHTING



OTHER FUNCTIONALITIES



Create your own rules
for fault and alert evaluation



Avoidance of unauthorised entry into
Electric distribution box - siren



SMS and email notifications



Maintenance process



Virtual Points:

Urban planning
Archiving of history for lighting points



Mobile application
for installation work and service



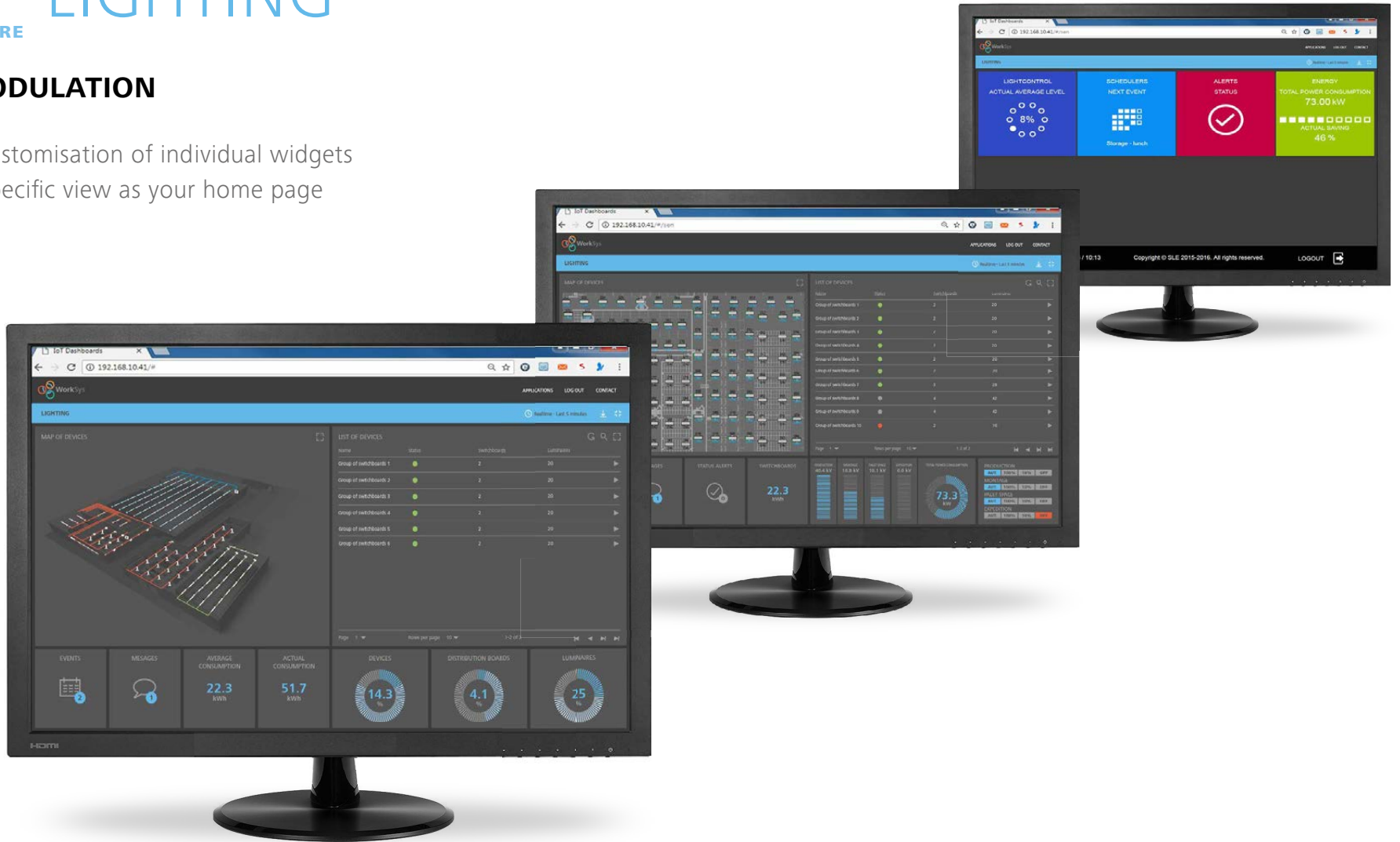
The process of registering and
deregistering of devices



Possibility to connect luminaires from
other manufacturers into the system

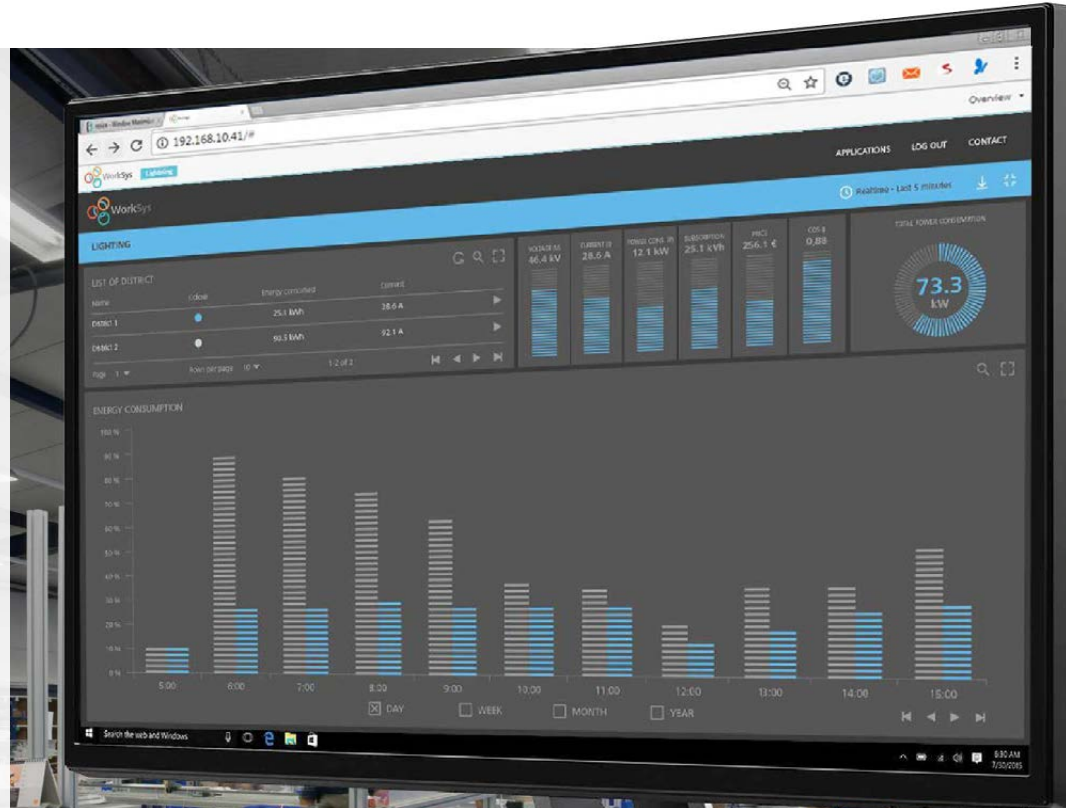
GUI MODULATION

- Own customisation of individual widgets
- Set a specific view as your home page



GENERAL ELECTRICITY, WATER, GAS

- Displaying the actual consumption of measured energy (total, for specific power panel/water meter/gas meter, for specific output)
- History of measured consumption (possibility of comparing various time periods)
- Data conversion to csv or xlsx
- Prediction/trends on the basis of preceding time periods
- Data backup
- Conversion to money and energy savings
- Battery-powered measuring device (transmitter)
- Alerts by SMS or email
- Alerts for increased/reduced anticipated consumption
- Optional installation of the measuring device on currently fitted electric meters/water meters/gas meters



ELECTRIC ENERGY

- Electrical power network quality monitoring
- Power cuts recording (general, local)
- Switchgear monitoring: circuit breaker status, switchgear inside temperature, switchgear remote shutdown, door open monitoring (authorised servicing)
- Consumption measurement on particular equipment/machine on the premises
- Photovoltaic parameters monitoring
- Optional monitoring of other switchgear components



GAS

- CO2 leakage monitoring or early fire detection



WATER

- Pipe pressure monitoring and area flooding detection
- Media flow rate measurement (e.g. for waste water at a water treatment plant)





SAFETY

**CCTV MONITORING
VIDEO IMAGE ANALYSIS
NOISE DETECTION
FIRE DETECTION
DANGEROUS GASES DETECTION**



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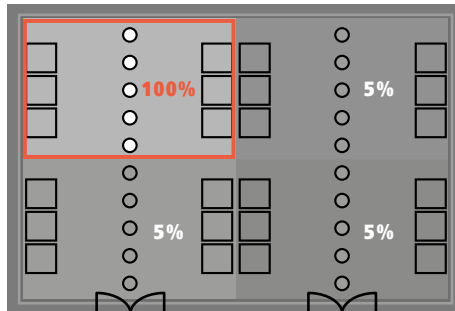


CCTV MONITORING

Thanks to the Lighting management system (LMS) and CCTV interconnection, it is possible to set areas that are captured by camera.

It means, that it can be adjusted to increase the intensity of the motion during the move and the captured image should be more easily recognisable.

LIGHTING



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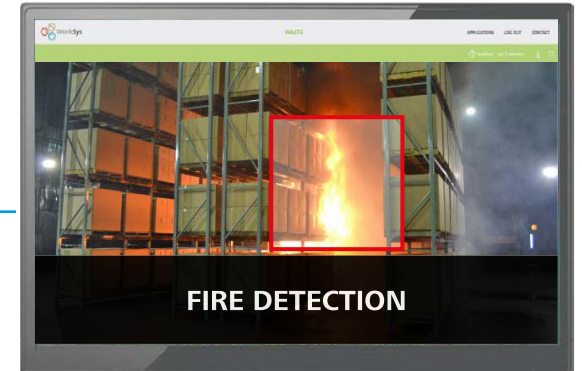
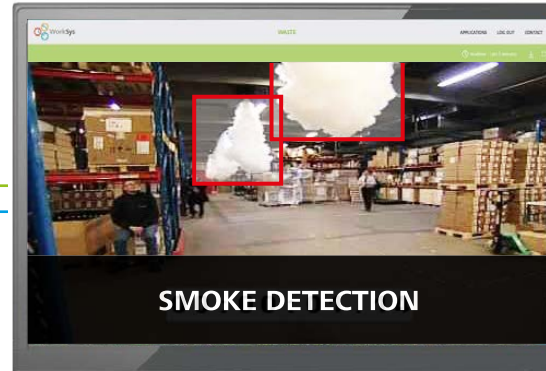
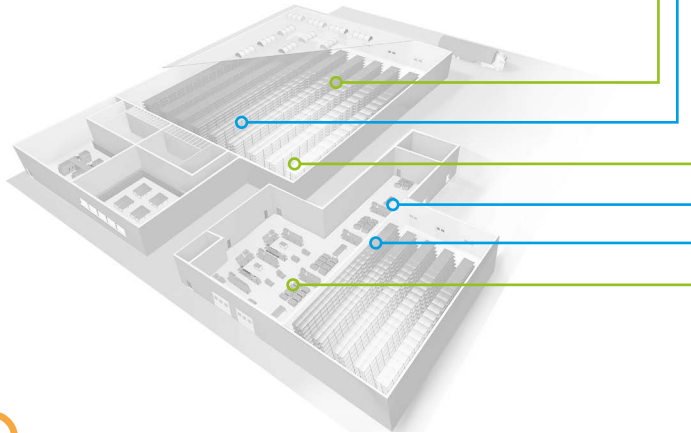


VIDEO ANALYSIS OF THE IMAGE

The video analytics module streamlines the automated supervision of critical events.

The digital signal processing circuits ensure high detection sensitivity.

The high resistance to false alarms remains preserved.

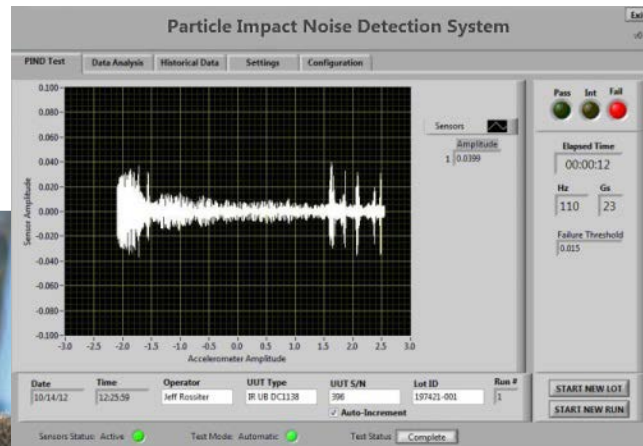


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NOISE DETECTION

It is possible with usage of sound sensors to draw attention not only to the upcoming noise transference, but thanks to frequency analysis also recognise the number of engine speeds and highlight their high load or excessive wear.



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FIRE & GASES DETECTION



FIRE
ALARM



GAS
ALARM

FIRE DETECTION DANGEROUS GASES DETECTION

The system can be connected with other various sensors and can be used to warn about the danger in the area (gas leakage, fire ...) by using light sirens.

The monitor displays a web-based safety monitoring interface. At the top, a red banner reads "FIRE!". Below this, a map of the facility shows various areas: LOADING STICKS, WAREHOUSE 1, WAREHOUSE 2, WAREHOUSE 3, WAREHOUSE 4, R&D, MONTAGE 1, MONTAGE 2, PRODUCTION 1, PRODUCTION 2, ADMINISTRATION I, and ADMINISTRATION II. A red fire icon is positioned over Warehouse 2. To the right of the map, there are two video feeds: "WAREHOUSE 2" showing a fire and "PRODUCTION 1" showing a factory interior. Below the video feeds is a "LIST OF CONTAINER" table.

Location	Status	Temperature	Noise	Fire	Gas	CO2	ppm
Warehouse 1	OK	20°	59 dB	OK	OK	OK	570 ppm
Warehouse 2	ALARM	30°	60 dB	ALARM	OK	OK	1013 ppm
Warehouse 3	OK	21°	58 dB	OK	OK	OK	498 ppm
Montage 2	OK	22°	60 dB	OK	OK	OK	933 ppm
Production 1	OK	21°	59 dB	OK	OK	OK	402 ppm
Production 2	OK	20°	59 dB	OK	OK	OK	440 ppm



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ENVIRONMENT

WORK ENVIRONMENT QUALITY

WASTE MANAGEMENT

EMISSIONS

AIR QUALITY

WATER QUALITY

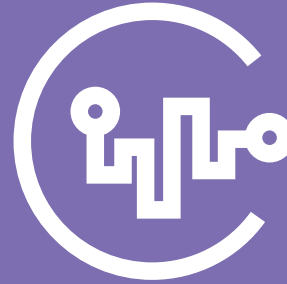


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MONITORING AND DATA

- Instantaneous measurements of temperature in various interior zones, humidity, noise level, VOC, dustiness, irradiation, UV radiation, CO2, icing, wind speed
- History of measured variables (time periods can be compared)
- Data conversion to csv or xlsx format
- Adopting actions in response to forecasted weather changes





PRODUCTION & LOGISTIC

**WAS - WORKER A-RFID
SYSTEM DETECTION
SYSTEM FOR MACHINERY MONITORING
RTLS - REAL-TIME LOCATION SYSTEMS
UMS
PERIPHERY CONTROLL AND MONITORING**



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WAS - WORKER A-RFID SYSTEM

SYSTEM FOR DETECTING ACCIDENTAL WORKER PRESENCE IN THE SAFETY ZONE AROUND MACHINERY

Application:

- Universal application for most construction and handling machines
- Clear identification of workers
- Exact measurement of workers (tags) from reference unit (machine) and also mutually between reference units

Benefits:

- UWB state-of-the-art technology
- Accuracy 1 m
- Range up to 50 m in an unobstructed space
- 2 configurable warning levels - distances (warning, alarm)
- Tag capacity up to 48 hours, inductive charging
- High resistance, IP65 rating
- System that is based on experience with monitoring of more than 40,000 mining personnel



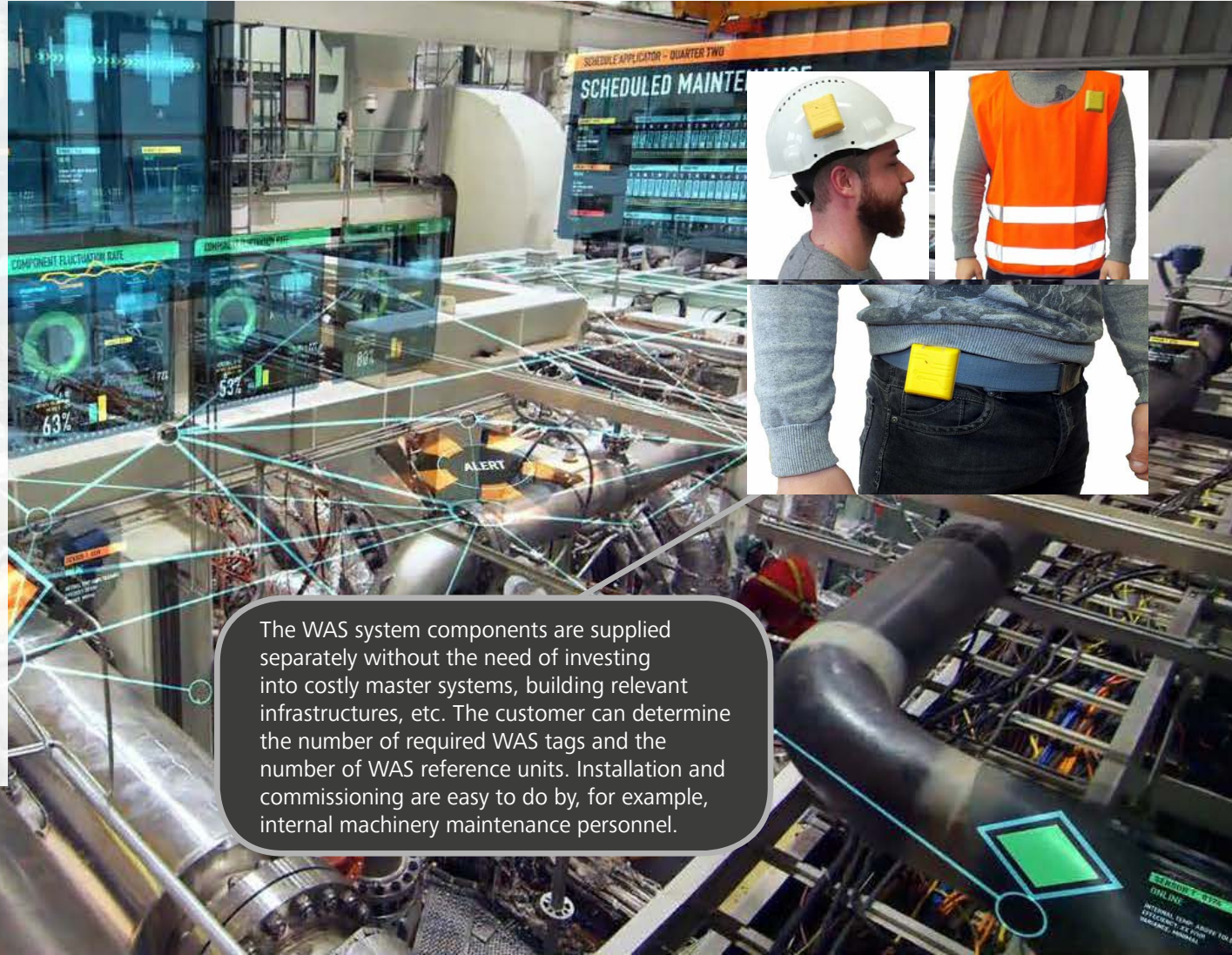
The Worker A-RFID System (WAS) incorporates a wide range of applications to reduce risks of occupational accidents and material damage. Using the latest UWB radio technology, the system detects the presence of a worker equipped with a tag in the machinery safety zone. It signals this dangerous condition both to the passing worker and the machine operator via acoustic warnings.

SYSTEM OF MONITORING THE PRESENCE OF PERSONS IN DANGEROUS AREAS

WAS tag has been designed to allow easy mount e.g. on a worker's belt, hard top or reflective vest. It has a compact design, large battery capacity, a range of up to 50m, inductive charging option, high resistance and sound signalling.

Reference unit:

- It consists of 2 parts (a radio module usually located on the machine's roof and an operator terminal)
- The unit informs the operator about possible safety zones interference
- The terminal has sound signalling and a display to show warnings and provide light signalling.
- It includes switching terminals to control certain machine components such as a warning light, change of machine movement mode, etc.



The WAS system components are supplied separately without the need of investing into costly master systems, building relevant infrastructures, etc. The customer can determine the number of required WAS tags and the number of WAS reference units. Installation and commissioning are easy to do by, for example, internal machinery maintenance personnel.

MONITORING OPERATING VARIABLES ON MACHINES AND PRODUCTION LINES

The system enables real-time monitoring of operational status of machinery and production lines. The system measures production times, identifies and records downtimes and keeps records of operational personnel.

Application:

- The system analyses data and generates automatic graphic outputs
- It can monitor times of production cycles and measure machine adjustment durations
- It measures temperatures and monitors temperature trends
- Tracking of downtime causes

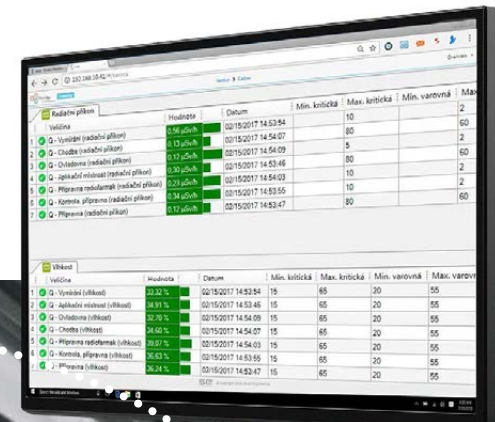


Each machine is fitted with data collection systems and a terminal for operator access.

TRACKING OF PRODUCTION ELEMENTS, PARTS AND COMPONENTS IN THE PRODUCTION PROCESS

In the automotive sector we track the flow of several thousands of vehicles through the final assembly operation daily. The tracked bodies are fitted with a wireless identifier throughout the assembly. They are localised by a network of reading devices installed over the covered area.

The obtained identification and location data are then automatically sent to the production technological units.



Paikinta	Suunnitelu	Diivum	Min. kiritikka	Max. kiritikka	Min. varovana	Max. varovana
Valkoinen						
G - Vyytelin (vaadakuu paikka)	14.53.54	02/15/2017 14.53.54	10			2
G - Chodda (vaadakuu paikka)	14.54.07	02/15/2017 14.54.07	80			60
G - O-labovana (vaadakuu paikka)	14.54.09	02/15/2017 14.54.09	5			60
G - O-labovana (vaadakuu paikka)	14.54.46	02/15/2017 14.54.46	80			60
G - O-labovana (vaadakuu paikka)	14.54.03	02/15/2017 14.54.03	10			2
G - Pijavana moduulimaa (vaadakuu paikka)	14.53.55	02/15/2017 14.53.55	10			2
G - Korvama pifavana (vaadakuu paikka)	14.53.55	02/15/2017 14.53.55	15			2
G - Pijavana (vaadakuu paikka)	14.53.47	02/15/2017 14.53.47	80			60



LOCATION TRACKING

Benefits:

- Complex RTLS (REAL-TIME LOCATION SYSTEMS) system
- Universal incorporation with existing technological equipment
- Automatic identification recording
- Statistic data collection allowing subsequent evaluation and prediction
- The system can graphically render obtained data using a well-arranged web application - interactive map, overview tables, statistical data, automatic recording configuration and other features
- This system can be successfully implemented in many sectors to make production more efficient, automate existing processes and reduce overhead costs



MONITORING AND DATA

The system consists of three main components:

- Sensors (measurement of variables)
- Main control unit (collection point)
- Supervisory software (displays statistics, instantaneous values, etc.)

System benefits:

- Wide ranges of measurement
- Variability – number of sensors for the measurement of various variables
- Wireless communication between sensors and the central unit
- Connection of the central unit to the local data network
- Remote data calculation option
- Comprehensive control and supervisory software
- People movement monitoring
- Measurement reports printing
- Data archiving



INTEGRATION OF FUNCTION UNITS

- Local position of objects within the plant's premises (wagon, truck, freight container...)
- Gate & door open/close status monitoring
- Wireless control button panels
- Remote control relays
- Potential-free contact sensing
- Integration of other sensors using the Sigfox, LoRaWAN and NB-IoT technologies





HUMAN

INFORMATION SYSTEM

ATTENDANCE SYSTEM
EMPLOYEES MONITORING



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INFORMATION SYSTEM

The easily accessible information for employees increases awareness of the company.

Improve of the positive relationship of employees is strengthening the loyalty for the company. Employees are informed about company results, plans, management (per day, per week, per month) thus building healthy competition between departments.

Company Information

- Acquired projects
- HR news
- Job vacancy

Localisation of employees

- Who and where works (personal details with name of department)

Factory information

- Evaluation of individual segments
- Number of manufactured pieces
- Consider productivity / accuracy



KIOSK is made to meet the needs of people, ALL PEOPLE, as they navigate the work places.



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THANK YOU FOR
YOUR ATTENTION

