İstanbul IT and Smart City Technologies Inc.

INTELLIGENT LIGHTING SYSTEMS

İSBAK AŞ is an affiliated company of İstanbul Metropolitan Municipality

Intelligent Lighting Systems

Intelligent Lighting Systems, with its Lighting Software and Electronic Module Lighting Board, enable central monitoring and control of roads, parks, tunnels or any other similar dispersed Smart Lighting System on real-time basis.

Intelligent Lighting Board Technical Features

Electronic Unit

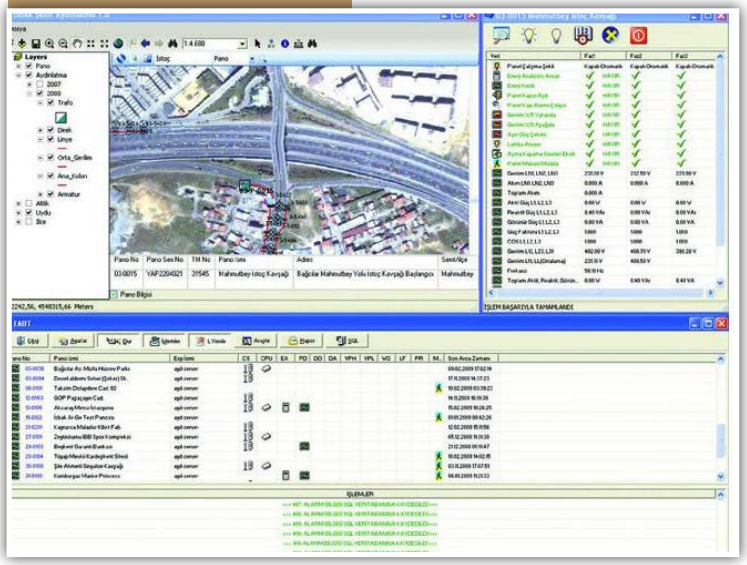
- PLC based Power Control, Failure and Monitoring Unit,
- Energy Analyzer,
- Communication Unit.

Cabinet

- IP54 Protection class,
- EMC test approved by an accredited laboratory,
- Complying with TSE 3367 standard,
- In conformity with Tedas's Technical Specifications on Metal Enclosed Low-Voltage Power Distribution Panels (TEDAS- MYD/2003-006.A),
- Adjustable Residual Current Protection Module at energy input,
- Leakage Current Protection Switch at energy output,
- Reactive Power Control Relay,
- Surge protector against excessive voltage, inner board lighting, heating, cooling and air-conditioning system.

Electronic Module Lighting Panel

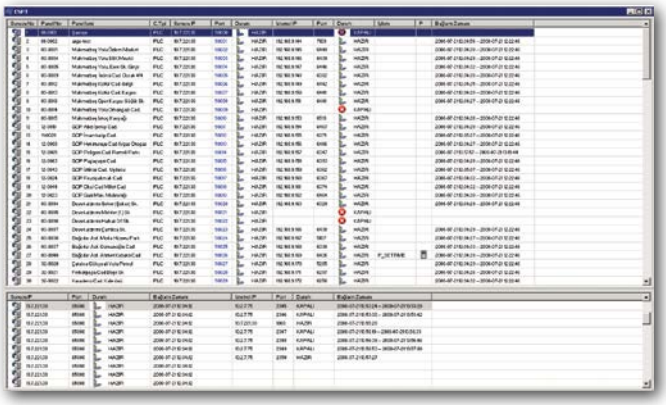
Lighting Software



Lighting Software

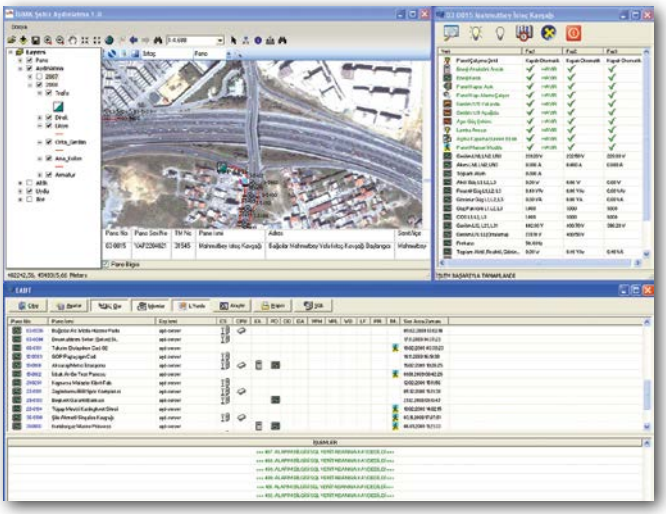
Lighting Software enables central monitoring and control, maintenance-repair tracking and reporting of the Lighting Systems.

The software is used for monitoring power and alarm data collected from the site and keeping the lighting system under control.



Lighting Software Features

- Tracking of failures and maintenance processes,
- Assignment of failure work orders to maintenance teams,
- Evaluation of performances of the regional teams,
- Reporting details of alarms and panel information obtained within a certain period of time,
- Graphical display of failure statistics and energy parameters,
- Receiving real-time data from the lighting system panels,
- Centralized activation/deactivation of the lighting system,
- Listing current alarm information obtained from the relevant site.



LIGHTiST

REMOTE CONTROL-FAILURE DETECTION-LIGHT BRIGHTNESS ADJUSTMENTS

LIGHTIST, by transmitting information between the center and the lighting armatures through the electric line, offers power efficiency-enhancing solutions.

Innovations of LIGHTIST

Intelligent lighting networks LIGHTIST, uses all the capabilities of lighting unit accurately and efficiently by communicating with each lighting unit separately. Therefore, it does not require a separate cable network except for the electric cable. It performs the control of many different units over same electric cable.

Manageable Operations

- Remote programming of all street lighting network outlets, any number of lamp groups and single armature in a single location,
- Lower ENERGY CONSUMPTION by activating/deactivating the armatures on certain times; changing the brightness of them on times pedestrian or vehicle traffic is low or none,
- Possibility to develop and implement a lighting protocol that will optimize your lighting network performance,
- Detecting improper grounding, defective isolation, broken lamps, illegal connections on the power line,
- Rapid report generation for installation planning, maintenance programs and power use,
- Periodical adjustability of the light brightness levels of

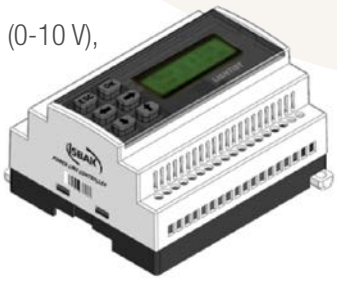
lamps (daily, weekly, monthly or in a time interval determined by the user),

- Providing efficient lighting by calculating the geographic location of your region using mathematical formulations and determining the Sun Rise and Sun Set hours properly and accurately,
- By its Life Timer feature, easy access to the information about for how long each armature has been used,
- 40% saving in energy consumption,
- 50% less maintenance cost,
- Map-based effective control and management,
- Being able to monitor lighting system through Tablet PC and mobile software,
- With the “LIGHTIST” system, emergency messages can be sent as SMS to a designated number.

LIGHTiST Technical Features

LIGHTiST POLECNT

LED Display Panel (Optional: LCD Display Panel)
Digital Inputs – Outputs
Analogous Inputs – Outputs (0-10 V),
4 - 20mA Current Input,
Data logging,
Real Time Clock,
Astronomic time relay,
RS232 & RS485



Tablet PC Control Interface

Advanced Technical Features	Powerline modem, Astronomical Clock, Advanced light intensity adjustment
Protocol	LIGHTiST v1
Operating Temperature	-25°C to + 70°C
Operating Voltage	230 VAC (-%15, +%10)
Operating Frequency	47Hz – 63Hz
Power Consumption	< 3 Watt
Power Line Communication Carrier Frequency	CENELEC A (3kHz – 95kHz), CENELEC B (95kHz – 125kHz), CENELEC standart EN 50065-1
Baud Rate	38400 bps
Error Correction	CRC16
Dynamic Operation Range	>85dB
Receiver Sensitivity	<1mV PTP
Mechanical Specifications	Designed for LIGHTIST applications, Plug and Play feature, Does not require an extra connection except power connection.

Exterior Lighting Armatures

150W LED Road Lighting Armature Technical Features

Model: LXMLED24-150W

Areas of Use

150 W LED Road lighting armature is used especially on 8-12 m high poles for M2 class roads. In PLC models (Power Line Communication) output power can be controlled between 0% -100%.

Advantages

- It has a long life span (L70: 80,000 hours) and allows more than 60% energy saving.
- 80% reduction in maintenance cost.
- Does not contain UV (ultra violet) and it is corrosion-resistant.
- Environmentally friendly (does not contain mercury).
- Applicable to the present lighting poles,
- Instant lighting, no delay.
- Dimmable,
- Not being affected by the grid voltage fluctuations,
- Not being affected by vibration,
- Not emitting radiation,
- Since it is continuously developing, predicted to be used more in future and has superior Technical Features, LED technology is preferred to sodium and mercury vapor lamps.

Technical Features

A) Electrical Features:

- LED modules used in the armature have reverse-polarity protection.
- LED armature is designed in a way not to be exposed, under any condition, to grid voltage of the LED packages.
- Armature operation is not affected by the grid voltage fluctuations.
- Operation Voltage Range: 230 VAC (-15%, +10%).
- Operation Frequency Range: 50Hz/60Hz.
- Power Factor > 0.98.
- Total Harmonic Distortion (THDi)

Efficiency of LED Driver is 93%.

- LED Driver complies with EMC standards.
- Operation temperature range: -40°C ~+50°C.
- LEDs are released with maximum 530mA current to prevent them from dissipating too much heat so they can have long life.
- Total active power consumption is maximum 153W.
- The armature has 94°C over-temperature protection.
- The armature is dimmable when required.
- The PCBs, on where the power LEDs will be placed, are produced by aluminum Metal Core PCB for a better cooling process.
- The armature is produced as lead free (LF) and in compliance with RoHS.
- The LED driver, which slides LEDs in the armature, is located in its own casing within the main body of the armature.

B) Optical Features:

- Instant lighting, no delay.
- Correlated Color Temperature (CCT) of the Power Leds used is 4000K±5%.
- The armature's Color Rendering Index (CRI) is higher than 70.
- The armature's efficiency factor is 109.1 lm/W.
- The armature's optical efficiency is 87%.
- Total luminous flux is 16480 lumens.
- Power LED road lighting armature has the appropriate lens and reflector required for providing the required optical values.
- The armature complies with the TS 8700 EN 60598-2-3 set forth by the Turkish Standards Institution (TSE)

C) Mechanical Features

- Easily-installable and maintainable.
- Not affected by vibration.
- Stable and efficient operation between -40°C ~+50°C.
- All electrical and optical equipments are connected to each other by means of connectors.

- The armature has two covers. The LED driver, which slides LEDs in the armature, is located in its own casing within the main body of the armature.
- The armature has silicone seal, 5 mm tempered glass and stainless steel connection elements. Also there is a corrosion- and rust-proof pressure aluminum case, which is designed appropriate for 153W power consumption, used in the armature.
- Together with all its components, the armature can operate under standard operation conditions for 80000 hours.
- Measurement of all the LED packages used is performed according to IEC 62471 standard and they comply with the photobiological safety requirements.
- The PCBs, on where the power LEDs will be placed, are produced from aluminum Metal Core PCB for a better cooling process.
- Armature Dimensions:

577mm*312mm*94mm. The armature's external area exposed to wind power is 0,18 m2.

- Total weight of the armature is 10 kg.
- The armature complies with EMC standard.

D) Protection and Protection Levels

- The armature has IP 65 protection level (against dust and humidity) in accordance with TS 3033 EN 60529.
- The armature is resistant to external blows.
- The armature's protection level against electric shocks is "I".
- The inner cables of armature are fireproof.
- Armature tests are conducted in accordance with TS EN60598-1 and TS EN60598-2-3 Standards.

Exterior Lighting Armatures

40W Power LED Pedestrian/Park Light

Technical Features

Model:OSRPLED30-40W

Areas of Use

They are used at 4-6 m heights for pedestrian-parking area outdoor lighting systems.

Advantages

- It has a long life span (50000- 80000 hours).
- It allows more than 55% energy saving.
- 80% reduction in maintenance cost.
- Does not contain UV (ultra violet) and it is corrosion-resistant.
- Environmentally friendly (does not contain mercury).
- Applicable to the current street light poles,
- Instant light up, delay free.
- Dimmable,
- Resistant to changes in network voltage,
- Color Recycle Index (CRI) is higher than 70 (Ra>70).
- Resistant to vibration,
- Radiation free,
- Is prepared to sodium and mercury vapor lamps due to continuous development of LED technology and largely to be used in the future and superior technical features.

Technical Features

A) Electrical Features:

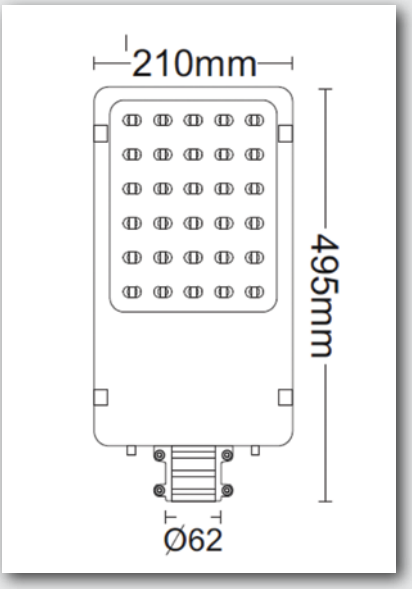
- Operating Voltage Range: 230 VAC (-15%, +10%).
- Operating Frequency Range: 50Hz/60Hz.
- Power Factor > 0.95.
- Total Harmonic Distortion (THDi) < 20.
- LED Driver's efficiency is higher than 85%.
- LED Driver complies with EMC standards.
- Operation temperature range: -40°C ~+50°C.
- LEDs are released with maximum 530mA current to prevent them from dissipating too much heat so they can have long life span.
- Total active power consumption is maximum 40W.
- Luminaire has over-voltage protection, over-current protection, short-circuit protection, over-temperature protection features.
- Luminaire is dimmable when required.
- The PCBs, on where the power LEDs will be placed, are produced by aluminum Metal Core PCB for a better cooling process.
- The armature is produced lead free (LF) and in compliance with RoHS.
- The LED driver, which slides LEDs in the armature, is located in its own casing within the main body of the armature.

B) Optical Features:

- Color Rendering Index (CRI) of the Power LEDs used is Ra > 70.
- Correlated Color Temperature (CCT) of the Power Leds used is Neutral White (5000K~6500K).
- When Power LEDs are released with 350mA, the average luminous flux is minimum 106 lm.
- The luminaire's total luminous flux is 2442 lm.
- The luminaire's optical tests are performed by a test laboratory accredited by Turkish Accreditation Agency (TURKAK) according to TS EN 13032-1 / TS EN 13032-2 standards.
- Imax (C:μ) value is minimum 434.8/klm

(0 : 54.5°).

- The luminaire has the appropriate lens and reflector required for providing the required optical values.



C) Mechanical Features:

- It has IP 65 protection class.
- It has silicone seal, 5 mm tempered glass and stainless steel connection elements.
- Also there is a pressure aluminum case, which is designed appropriate for 30W~50W power consumption, used in the armature.
- It has the most effective design for heat distribution.
- The inner cables of armature are fireproof.
- In terms of compliance with ME4a lighting class according to TS EN 13201 standard, it should be mounted on a pole with a 0° angel to horizontal axis.
- Total weight of the luminaire does not exceed 3.8Kg.
- Dimensions: 210mm*495mm*70mm

Exterior Lighting Armatures

45-85W LED Road Lighting Armature

Model:LXMLED10-45/85W

Areas of Use

This armature offers a high-performance, easy-manageable, fast and cost-efficient lighting solution. The illuminating power can be adjusted to 45W or 85W depending on the requirement.

General Features

- Weight: 6,2 kg
- IP Class: 66
- Life: 80.000 hours
- Operating Temperature: -40°C to + 50°C

Optical Features

- Total Luminous Flux of Armature: min. 4700 lm, max. 9000lm
- Optical Efficiency: 85%
- Color Temperature (CTT): 4000 ± 5% K
- Color Rendering (CRI) > 70

Electrical Features

- Operating Voltage Range: 230 VAC (-15%, +10%)
- Total Power of the System (min): 46,7W
- Total Power of the System (max): 88,9W
- Driver Efficiency (46,7W): 90%
- Driver Efficiency (88,9W): 91%
- Power Factor (46,7W): 0,938
- Power Factor (88,9W): 0,973
- Total Harmonic Distortion (THDi) (46.7 W): 11,2%
- Total Harmonic Distortion (THDi) (46.7 W): 7,4%

75W Flexiglass Lighting Armature

This is a UV (ultra-violet)-free, corrosion-resistant and environmentally-friendly lighting armature.

Areas of Application

- Factories and ateliers
- Storage areas

General Features

- Weight: 6 kg
- IP Class: 65
- Life: 80.000 hours

Thermal Features

- Trouble-free operation between -40°C - +50°C.

Electrical Features

- Operating Voltage Range: 230 VAC (-15%, +10%)
- Total Power: 75 W
- Driver Efficiency: >90%
- PF> 0,95
- THDI: <20%

Optical Features

- Total Luminous Flux of Armature: 600 lm
- Efficiency Factor: 80 lm/W
- Color Temperature (CCT): 5000-6500 K
- Color Rendering (CRI) > 70

200W General Purpose LED Projector

Areas of Application

- Carpet field lighting
- Parking area lighting
- Square Lighting
- Factory lighting

Features

- Dimensions: 552x397x172mm
- Weight: 15 kg
- IP Class: 65
- Operating Voltage Range: 230 VAC (-15%, +10%)
- Total Power of the System: 200 W
- Total Luminous Flux of Armature: 20.000 lm

200W General Purpose LED Projector

Areas of Application

- Carpet field lighting
- Parking area lighting
- Square Lighting
- Factory lighting

Features

- Dimensions: 562x418x143mm
- Weight: 15 kg
- IP Class: 65
- Operating Voltage Range: 230 VAC (-15%, +10%)
- Total Power of the System: 200 W
- Total Luminous Flux of Armature: 20.000 lm

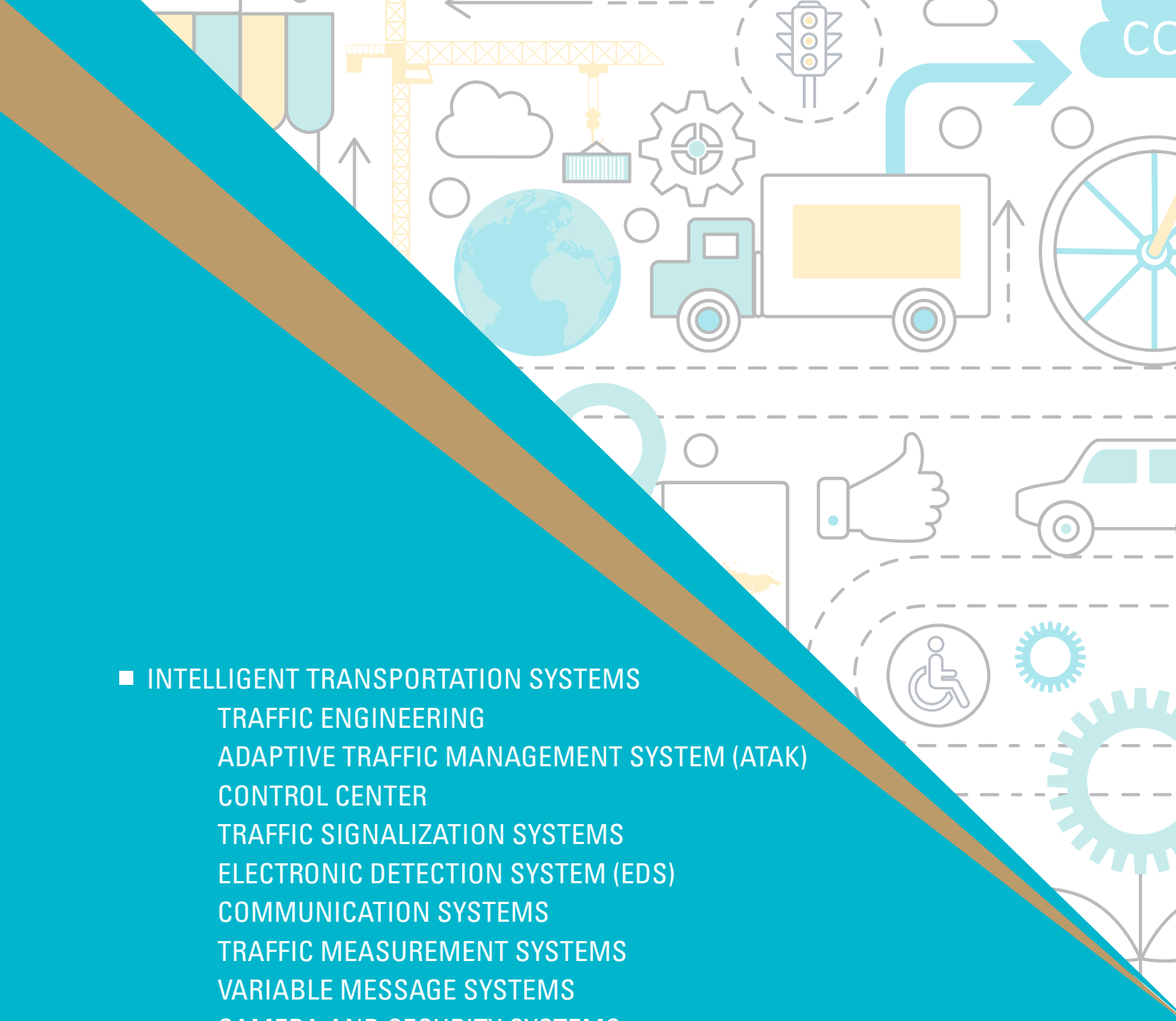
200W Focus LED Projector

Areas of Application

- Flag pole
- One-focus-point lighting applications such as decorative facade lighting.

Features

- Dimensions: 552x397x172mm
- Weight: 15 kg
- IP Class: 65
- Operating Voltage Range: 230 VAC (-15%, +10%)
- Total Power of the System: 200 W
- Total Luminous Flux of Armature: 20.000 lm



- INTELLIGENT TRANSPORTATION SYSTEMS
  - TRAFFIC ENGINEERING
  - ADAPTIVE TRAFFIC MANAGEMENT SYSTEM (ATAK)
  - CONTROL CENTER
  - TRAFFIC SIGNALIZATION SYSTEMS
  - ELECTRONIC DETECTION SYSTEM (EDS)
  - COMMUNICATION SYSTEMS
  - TRAFFIC MEASUREMENT SYSTEMS
  - VARIABLE MESSAGE SYSTEMS
  - CAMERA AND SECURITY SYSTEMS
- TUNNEL SCADA MANAGEMENT SYSTEM
- INTELLIGENT LIGHTING SYSTEMS
- CONTENT MANAGEMENT SYSTEMS
- VEHICLE TRACKING AND FLEET MANAGEMENT
- SYSTEM (ISMOBIL)

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