



# HIGH-TECH SOLUTIONS FOR SMART CITY APPLICATIONS AND LIGHTING OF MUNICIPALITIES AND BUSINESS

*Financial Instruments for Energy Efficiency and RES*

*Investment Council at the BCCI*

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## MAIN AREAS OF ACTIVITY

### 4S4 GROUP

International group of companies engaged in development and production of radio electronics and **one of the leaders** in the field of electricity metering systems, Smart City solutions and energy-saving LED equipment.

Lighting management systems **4S4net**

LED lighting (**4S4 Lighting**)

LED drivers **4S4** with increased reliability and exceptional 99 % efficiency

Electricity metering systems **4S4**

Electronic trade equipment **4S4**

Information display systems **4S4**:  
video walls, video screens, information boards.

Tachographs, taximeters **4S4**





**Founded in 2006** with headquarters in Sofia, Bulgaria - EU member state;

**Main activities:** design, development, production, sales and servicing of electronic devices;

**Office in Sofia:** development & design of the products, as well as the administrative activities, commercial departments and service area;

**Production facilities** in Botevgrad, located 60 km from Sofia in micro electronics industrial zone;

**Highly qualified** scientists, engineers, technicians;

**Certificates:** ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO/IEC 27001:2013 and others.



## **Production Facilities and R&D:**

Botevgrad and Sofia, Bulgaria.

**Office:** Sofia, Bulgaria.

## **Distribution around the Globe:**

- Europe
- Latin America
- Africa
- Middle Asia

**From** R&D **to** the release of serial products for sale.





# GROUP PRODUCTION FACILITIES

## Manufacturing company

- Main production plant in Bulgaria: Botevgrad

## R&D

- Sofia



## Own production equipment of the 4S4 Group

- SMT lines;
- Selective soldering lines, wave soldering lines;
- Metal and plastic painting lines;
- Robots for applying adhesive compositions and pouring;
- Metal processing centers, automated cutting machines;
- Plastic injection molding machines with injection molds, dies and other accessories. Extrusion lines from 15 m to 30 m;
- Large-format metal lasers. Laser installations on plastic;
- Testing, control and measuring equipment.



# MODERN MANUFACTURING PLANT



**Chip mounting /  
SMT lines.**

**Assembly lines to produce LED luminaries of the wide  
application range** (street, park, industry, office, retail,  
architectural, sports, phyto, lighting for poultry farms &  
secondary rooms, LED lamps etc.).

**Test laboratory &  
R&D equipment.**





# ADVANTAGES OF 4S4 LED LUMINARIES



**Less weight due** to thoughtful construction of luminaries' housings which are made of aluminum alloy and high-strength plastic. That lowers the load on the carrier. We have particularly light and compact models (MAG10, KASKAD) with similar lighting characteristics and more attractive prices.



**More careful heat dissipation system,** which guarantees extended service life.



**Patented technology** of connecting housings, lenses and panels with LEDs—without firm fastening with screws, which guarantees its integrity, tightness, performance and the absence of internal contamination for a long life. Most lamps on the market have a different construction.



**Only LEDs from leading companies OSRAM, SAMSUNG** are used. Well-designed electric scheme: the use of LEDs in the mode of up to 50% of maximum power, through integrated protections and compensation of LED degradation guarantee the durability of the lamp and its performance in all conditions.



Possibility to equip lamps with drivers / modems that allow their work to be **automated by different algorithms** (on / off depending on the time of day, programming at a certain time, from light sensors, motion, remote control), thus achieving maximum comfort in lighting area and production sites depending on the needs of users.





# MORE THAN 200 PATENTS, LICENSES AND CERTIFICATES

**4S4 Group** has got more than 200 patents, including those operating in USA, India, Korea, Germany and other countries.

More than 200 licenses and certificates in Europe (EC) and other countries for individual products and product series.



# SMART CITY SOLUTIONS



- **4S4 Net** allows to manage the luminaires (switch on/off, dimming etc.) and to receive from them all the data required.
- The unique feature of **4S4 Net** is that with correct network creation it has unlimited range of coverage and practically unlimited number of controlled luminaires.
- High reliability (in case of a failure in the system or in any of its segments) is ensured by possible off-line operation of each luminaire according to pre-set algorithm.
- The system is able to operate in various environments (BLE, RF, PLC, etc.).
- The solutions embedded in **4S4 Net** have been implemented in a number of countries, including Greece, Kazakhstan, Bulgaria, Argentina, Bolivia and other.





# ESCO Financing

**4S4 Group has signed contracts with ESCO companies to support municipality and business projects development**

**Completed ESCO Projects:**

- Silistra Municipality, Bulgaria
- Botevgrad Municipality, Bulgaria
- Volos, Greece







### • Street lighting

Installation of street and park luminaires with smart 4S4 Net lighting control system. Installed within 2019 – 2020:

**6 464** pcs smart luminaires **MAG.3** series;

**1 344** pcs smart park luminaires, including:

- 250 pcs STREET 56 - 055;
- 1 094 pcs BALL 400-60;
- 40 pcs INDUSTRY.3 -160 luminaires with dimming in basketball court Kakouris.



**MAG series**



# PROJECTS IN GREECE



Ilion, Volos, Mykonos



- Street & Park
- Industrial lighting

Installation of street and park luminaires with smart 4S4 Net lighting control system.

Pilot projects in 2017:

- 20 pcs of MAG.3-105 & MAG.3-085 luminaires;
- 62 pcs of MAG.3-105 & 4 pcs MAG.3-135 luminaires.

Installed in 2020:

- **18 135** pcs of street, park and industrial luminaires.



MAG series

STREET 56



BALL



# PROJECTS IN LATIN AMERICA



Cuba, Argentina



- Street lighting
- Industrial lighting

Lighting system upgrade in the province of Buenos Aires.

Lighting system at the battery factory in Argentina.

#### Argentina:

- Municipality of Lanus;
- Municipality of Bahia-Blanca;
- Municipality of Quilmes.

#### Cuba:

- Santa-Clara.

INDUSTRY.M



BALL







- Street lighting

Lighting system upgrade of a central Street **Santa Cruz de la Sierra** with Lighting Control System **4S4 Net** as a part of participation in the project to replace **15 000** street luminaries



**MAG series**

# PROJECTS IN LATIN AMERICA



## Argentina



- Street lighting

Lighting system upgrade of several streets at **Buenos Aires** with Lighting Control System 4S4 Net

More than **4 500** street luminaries installed in 2017-2018



**MAG series**



# PROJECTS IN BULGARIA



Botevgrad, Pravets, Silistra



- Street lighting

- Industrial lighting

Multiple indoor LED retrofit projects all over Bulgaria

(hospitals, shopping & business centers).

INDUSTRY.3



MAG series





# PROJECTS IN KAZAKHSTAN



- **Kazakhstan National Railways**
- **Street lighting**

- > 23 000 outdoor LED luminaires with specialized mounting.
- > 15 000 LED luminaires were supplied in 2015 and showed excellent field-performance data.
- > 8 200 pcs MAG2-120-248.
- > 8 000 LED luminaires installed in October 2017.



**MAG series**

# PROJECTS IN GERMANY



- Schools
- Warehouses
- Offices
- Shops

Shipped within the period 2018 – 2019: **1 220** pcs SLIMPANEL:

- FES School in Minden 200 pcs;
- School in Detmold 200 pcs;
- Warehouses, offices, shops in Frankfurt am Main and in Munich: 820 pcs.



**SLIMPANEL lamp**

600x600 mm  
24 Watt



# PROJECTS IN EASTERN EUROPE



- Sport & trade Malls
- Supermarket retail chains

> 100 000 pcs.

> 150 000 pcs.

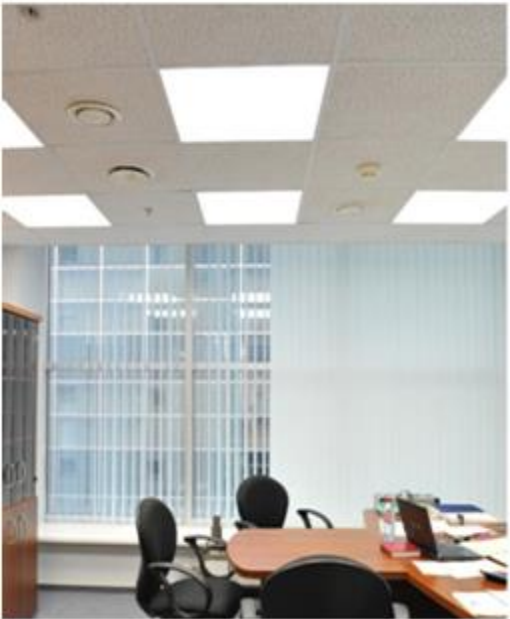


**SLIMPANEL lamp**

600x600 mm  
24 Watt



# PROJECTS IN EASTERN EUROPE



- Banks
- Shopping centers

> 150 000 pcs.



**SLIMPANEL lamp**

600x600 mm  
24 Watt

# BEST SELLERS – STREET LUMINAIRES



**MAG31** ZHAGA connector

W	lm
75	12 400
105	17 400
130	21 500
155	25 570



**MAG44**

W	lm
120	16 800
160	22 400
200	28 000



**MAG10**

W	lm
25	3 500
60	8 400
90	12 600



**Rollamp**

W	lm
30	4100
35	4725
40	5400
45	6075

Energy efficiency **>165 lm/W**  
Lifetime **>80,000h**  
Warranty **7 or 10 years**

- IP 66/ CRI >70 / 4000 K
- Low percent flicker <5%
- 6 kV “line–line”, 10 kV “line–ground”
- Surge protection ≥300 V
- Thermal stabilization
- Driver separated from LED cluster
- Easy installation & maintenance

Matrix-like system of LED connections along with their operation at 25% of the maximum power **ensure the durability of the luminaire** and its operability in case of failure of any LED.

Size, mm:	
585x105x104	800x105x104
695x105x104	910x105x104

Energy efficiency **>140 lm/W**  
Lifetime **>50,000h**  
Warranty **3 years**  
**Cost-effective** modification of an outdoor luminaire with a lightweight housing.

- IP 65/CRI >70 / 4000 K
- Low percent flicker <5%
- 2 kV “line–line”, 4 kV “line–ground”
- Surge protection ≥300 V
- Thermal stabilization
- An AC-Direct driver is integrated into each LED module
- Constant power mode

**Custom-made Options:**  
BLE\RF management

Size, mm:	
304x205x87	
407x205x87	

Energy efficiency **>140 lm/W**  
Lifetime **>50,000h**  
Warranty **3 years**  
**Cost-effective** modification of an outdoor luminaire with a lightweight housing.

- IP 65/CRI >70 / 4000 K
- Low percent flicker <5%
- 2 kV “line–line”, 4 kV “line–ground”
- Surge protection ≥300 V
- Thermal stabilization
- An AC-Direct driver is integrated into each LED module
- Constant power mode

**Custom-made Options:**  
BLE\RF management

Size, mm:	
229x126x34	
334x126x34	

Energy efficiency **>135 lm/W**  
Lifetime **>50 000 h**  
Warranty **3 years**  
**Cost-effective** Rollamp 30/35/40/45 W – nondirectional and sector lamps with LEDs located in the 360° and 90° sector. Designed for use in park and other luminaires with a circular diagram of the luminous flux distribution.

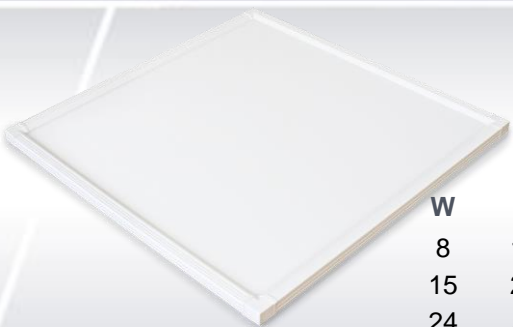
- IP 20 / IP 54 / CRI >80 / 4000 K
- Low percent flicker <5%
- Thermal stabilization
- Easy installation maintenance
- Best decision for retrofit street luminaires with directional and park lighting.

Size, mm:  
73x225; 73x245



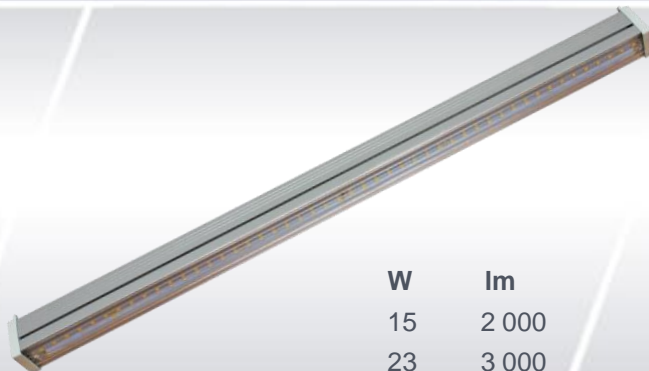


# BEST SELLERS – INDOOR LUMINARIES



**SLIMPANEL**

W	lm
8	1600
15	2180
24	3480
48	6960



W	lm
15	2 000
23	3 000



W	lm
11	1375
17	2125
40	5000



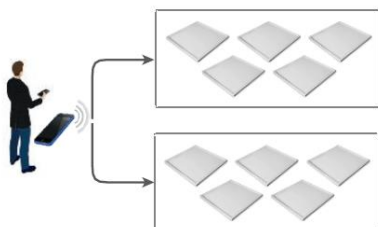
W	lm
18	2340

Energy efficiency **>145 lm/W**  
Lifetime > **50,000h**  
Warranty **3 years**

The thickness of the luminaire with integrated driver: 17mm  
The light guide is 3 mm thick

- IP 40/ CRI >80 / 4000 K
- Low percent flicker <5%
- Custom-made Options:
- Easy control by the smartphone via Bluetooth (dimming, adjustable color temperature –on request)

**Size, mm:**  
295 x 295 x 17  
595 x 295 x 17  
625 x 625x17  
295 x 1195x17  
595 x 1195x17



Energy efficiency **>130 lm/W**  
Lifetime > **50,000h**  
Warranty **3 years**

- IP 40 / CRI >80 / 4000 K
- Low percent flicker <5%
- Application separate or in an endless line possible
- Optimal for retail locations
- Module design for many lighting options

**Size, mm:** 580-1,200 x 28 x 40

- Side by side, 2 and more
- As a light line



Energy efficiency **>125 lm/W**  
Lifetime > **50,000h**  
Warranty **3 years**

The illumination of the diffusor plane creates a soft, comfortable light and cozy atmosphere.

- IP 20 / CRI >80 / 4000 K
- Low percent flicker <5%
- Suitable for administrative, office and retail salesroom premises and seamless in the design of restaurants, cafés, hotels and homes

**Size, mm:** 358x21; 508x21; 1,000x21

Energy efficiency **>130 lm/W**  
Lifetime > **50,000h**  
Warranty **3 years**

Reliable and energy-efficient LED luminaires of the DELTA series are equipped with microwave occupancy sensors based on the Doppler effect.

- IP 40 / CRI >80 / 4000 K
- Low percent flicker <5%
- Impact-resistant white polycarbonate
- Suitable for auxiliary rooms, corridors, halls, entrances, stairwells, elevator halls, bathrooms, residential and utility rooms.

**Size, mm:** 235x235x40



# BEST SELLERS – INDUSTRIAL LUMINAIRES



**INDUSTRY.3**

W	lm
75	11 250
105	15 750
130	19 500
155	23 250



**INDUSTRY.10**

W	lm
60	7 500
100	12 500
120	15 000
140	17 500



**LINE.PROM**

W	lm
15	1 950
30	3 900
50	6 500



**INDUSTRY.P**

W	lm
32	3 840
44	5 280
64	7 680



Energy efficiency **150lm/W**  
Lifetime > **50,000h**  
Warranty **3-7 years**

- IP 67 / CRI >70 / 4000 K
- Low percent flicker <5%
- 2 kV “line-line”, 4 kV “line-ground”.
- The driver has no thermal contact through the metal with the LED module
- Custom-made Options:

1-10, **DALI** on request

Size, mm:  
344x105x95  
440x105x95  
536x105x95  
632x105x95

Energy efficiency **>130 lm/W**  
Lifetime > **80 000 h**  
Warranty **3 years**  
Cost efficient version with a lightweight body

- IP 65/ CRI >70 / 4000 K
- Low percent flicker <5%
- 2 kV “line-line”
- Surge protection ≥300 V
- Thermal stabilization
- A unique design with an integrated AC-Direct driver.
- Weight of about 1kg

Size, mm:  
316x126x35  
612x126x35

Energy efficiency **>130 lm/W**  
Lifetime > **50 000 h**  
Warranty **3 years**  
Shockproof polycarbonate body.  
Vandal proof design

- IP 65 / CRI >80 / 4000 K
- Low percent flicker <5%
- A unique design with an integrated AC-Direct driver.
- Impact resistant polycarbonate housing.
- Dimming with conventional dimmer
- Opal or clear diffuser
- Mounting in one continuous luminous line
- Easy mounting using a 35 mm DIN rail

Size, mm:  
300x155x90\600x155x90  
1200x155x90

Energy efficiency **>120 lm/W**  
Lifetime > **50 000 h**  
Warranty **3 years**  
Energy efficient replacement for  
fluorescent luminaires

- IP65 / CRI >80 / 4000 K
- Low percent flicker <5%
- Opal diffuser, polycarbonate body
- Through wiring on request

Size, mm:  
1260x120x68





# BEST SELLERS – DRIVERS



## STANDARD



The **STANDARD** series LED drivers are current stabilizers that ensure the uniformity of a set parameter regardless the type of LEDs, their temperature and quantity. **IP 67** protection.

- The LED drivers allow the output current control, therefore, the brightness of the LEDs, by external signals: 0-10 V; by PWM; by resistor.
- They have protection against overheating, short circuit at the driver output and idling, as well as a standby power supply of 24 V 170 mA / 12 V 340 mA.
- ▶ Class A compliance in case of interruption/dip of input voltage (function).
- ▶ Use of a highly reliable element base, electrolytic capacitors with operating time of 10,000 hours or more at housing temperature of 105°C.
- ▶ Wide climatic range: from -50° to +85°C.
- ▶ 5 years warranty

## COMPACT

The **COMPACT** series LED drivers are current stabilizers that ensure the uniformity of a set parameter regardless the type of LEDs, their temperature and quantity.

- The COMPACT series LED driver is designed as a printed circuit board with installed components covered with a special moisture-proof material. This eliminates the use of metal or plastic housing.
- The LED drivers are protected against overheating, short circuit at the driver output and idling.
- ▶ Designed to operate in structures without forced cooling, subject to provision of natural convection of air flows.
- ▶ Have ingress protection IP67 and designed for use in street lighting schemes and can be used indoors.

## Network surge protection



The **ISP-10KA10KV surge protector**

designed to provide additional protection for the LED driver and LED luminary against the effects of high energy surges in the AC mains.

- ▶ Operate voltage L,N-GND, 1400 – 1600 V
- ▶ Maximum current, 13 kA
- ▶ Protection class IP65





**Ivan Bakalov**

Managing Director

✉ **bakalov@4s4group.bg**

☎ **+359 2 968 6035**

**+359 87 867 7086**

**www.4s4group.bg**

Head office:

2A Nedelcho Bonchev Str.,

Sofia, BG-1528,

Bulgaria