4S4 Group, a leading Bulgarian company, excels in innovation with over 200 patents and 200+ licenses across the globe. Specializing in Electronic Field Devices (EFDs), LED Lighting, and Energy Meters, our advanced manufacturing capabilities drive expansion. We're not only committed to technological advancement but also prioritize Environmental, Social, and Governance (ESG) considerations. Our ongoing optimization of manufacturing processes not only aims at efficiency but also emphasizes sustainability, ensuring top-quality products while minimizing environmental impact. 4S4 Group: pioneering excellence in technology, sustainability, and manufacturing.

4S4 GROUP

Production Facilities in Bulgaria
Offices: Sofia and Botevgrad

Distributors in Bulgaria, Greece, Romania, Zimbabwe, Kenya, Congo, Liberia, Namibia, Nigeria, Tanzania, Uganda and other countries

More than 800 types of products

Export of products to more than 30 countries in the world

Implementation of the latest technologies into production

Cooperation with the world's leading suppliers of electronic components

Company structure and main areas of activity

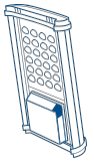
- **4S4 Trade**- Commercial and radio electronic trade equipment

  - Different types of EFDs
  - Fiscal memories
  - Fiscal printers

- **4S4 Lighting**- LED Lighting and Lighting management systems (LMS)

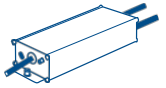
LED Lighting:

- Street & Road
- Park
- Office
- Commercial
- Industrial
- Auxiliary
- LED Lamp



Inteligent Lighting management systems (LMS)

LED drivers



- **4S4 Metering**- Electricity meters; Automated meter reading (AMR) and Advanced metering infrastructure (AMI)

Electricity meters:

- Singe- phase electricity meters
- Three- phase electricity meters
- Prepaid single and triple- phase electricity meters
- Customer interface unit (CIU) for prepaid electricity meters

Data communication technologies

ESD 118M

Technical characteristics

- Thermal printer:
  - ✓ easy paper loading
  - ✓ paper width - 57 mm, paper roll diameter - up to 57mm
- Graphic display – 22.4 x 5.6 mm; 128 x 32 pixels
- Fiscal memory – up to 1850 records of daily Z reports
- Dimensions (W x L x H), mm: 142x215x138 including the antenna
- Weight, kg: ~ 0, 800
- Real-time clock
- Micro SD memory card (4GB) USB port for communication with a PC
- Internal GPRS module for data transmitting to a designated server
- External power supply adapter: DC 9V / 3A
- Lithium battery (3V) supporting the real time clock
- Operating conditions:
  - ✓ temperature: 0°C up to + 45°C
  - ✓ relative air humidity: 10% up to 85%

Functional characteristics

- Compliant with communication Protocol 2.1.
- Update of client-server architecture.
- Capacity to insert and sign any required documentation.
  - ✓ To operate properly with a wide range of ERP systems
  - ✓ To sign both invoices and fiscal receipts.
- Adapted to new required Authority's interface including client & apos data and signature of part of requested data in QR code/ format.
- Customer's data information from the invoices - processed and sent to the Authority according to the new requirement's version.
- ESI designed to improve perceived performance, reduce processing overhead on the server and enhance availability.

181M

Technical characteristics

- Universal – suitable for all kind of shops
- Two displays – operator and customer one, with backlights, 128 x 32 pixels, graphic
- Thermal printer
  - ✓ easy paper loading; paper width – 57 mm, ⌀ 42 mm max.; printing rate – max 70 mm/ sec
- Keyboard
  - ✓ 12 digits keys; 13 functional keys
- Interfaces
  - ✓ USB and two RS-232C; GSM/GPRS communication module
- Fiscal memory – 1850 records of daily Z reports
- Micro SD memory card (up to 8 GB)
- External power supply adapter
- Built-in rechargeable battery: 7.4V, 1800 mAh
- Lithium battery supporting the real time clock
- Dimensions, mm: 196 x 86 x 61
- Weight, kg: ~ 0.370

Functional characteristics

- Compliant with communication Protocol 2.1
- Receipts, reports and messages in English or Swahili
- PLU barcodes and quantities in stock
- 8 departments
- 10 operators in Registration mode and 4 passwords for the other four modes (X reports, Z reports, Programming mode, Service mode)
- 5 VAT categories
- 8 commodity groups with programmable names
- 10 units of measure with programmable names
- Programmable receipt header – 8 lines
- Programmable receipt footer – 4 lines
- Printing of a graphic logo – 384 x 144 pixels
- Programmable clients database - 500 clients
- Discounts and mark-ups - percentage and value
- Receipt verification code and QR code are printed on receipt
- Registration of received on account and paid out amount
- Registration of purchases
- Reports:
  - ✓ PLU and PLU groups report
  - ✓ PLU quantities in stock
  - ✓ Commodity groups report
  - ✓ Departments report
  - ✓ VAT report
  - ✓ Operators report
  - ✓ Sales report
  - ✓ Daily X report and daily Z report
  - ✓ Daily Y report and weekly P report
- Fiscal memory reports
- Electronic journal printouts
- Communication protocol between ETR and PC is done
- Built-in tests

777

Technical characteristics

- Two graphic LCD displays with a backlight
- Thermal printer
  - ✓ Easy paper loading; Paper width: 57 mm, paper roll: Ø 42 mm; Printing speed - 75 mm/sec max.
  - ✓ 32 characters per line
- Keyboard
  - ✓ 12 digits keys; 18 functional keys
- Fiscal memory (FM) – 1850 records of daily Z reports
- Micro SD memory card – up to 8 GB
- Interfaces: USB, two RS-232C
- GPRS communication module
- Built-in rechargeable battery: 7.4V, 2000 mAh or 1800mAh
- External power supply adapter: AC 100-240V, 50/60Hz DC 9V, 2.66A
- Lithium battery (3V) supporting the real time clock
- Dimensions, mm: 111 x 240 x 83
- Weight, kg: ~ 0.700
- Operating conditions:
  - ✓ Temperature: -15°C ÷ +45°C; Relative air humidity: up to 95%

Functional characteristics

- Supports communication Protocol 2.1.
- Receipts, reports and messages in English or Swahili
- Programmable PLU database
- PLU barcodes and stock quantities - options
- 4 departments
- 10 operators
- 5 VAT categories
- 8 commodity groups with programmable names
- 10 programmable units of measure
- 5 types of payment
- Programmable receipt header – 8 lines
- Programmable receipt footer – 4 lines
- Printing of a graphic logo – 384 x 144 pixels
- Clients database - 500 clients
- Registration of discounts and mark-ups (percentage and value)
- Registration of received on account and paid out amounts
- Registration of purchases
- Reports – sends each fiscal receipt to FTP server of TRA:
  - ✓ PLU and PLU groups report; PLU stock quantities report
  - ✓ Commodity groups report; Departments report; VAT report
  - ✓ Operators report
  - ✓ Sales report
  - ✓ Daily X report and daily Z report
  - ✓ Daily Y report and weekly P report
- Fiscal memory reports:
  - ✓ Summary FM reports by dates or by Z numbers
  - ✓ Detailed FM reports by dates or by Z numbers
- Built-in tests

133M

Technical characteristics

- Two graphic LCD displays (128 x 32 pixels) with a backlight
- Thermal printer (Seiko Instruments Inc.)
  - ✓ easy paper loading; paper width – 57 mm, Ø 57 mm max.
- Keyboard
  - ✓ 12 digits keys; 26 functional keys
- Interfaces
  - ✓ USB; Two RS-232C; PS/2
- Cash drawer
- GSM/GPRS communication module
- Fiscal memory – 1850 records of daily Z reports
- Micro SD memory card (up to 8 GB)
- External power supply adapter
  - ✓ AC: 100-240V, 50/60 Hz; DC: 9 V / 2.66 A
- Built-in rechargeable battery: 7.4V, 1800mAh
- Lithium battery supporting the real time clock
- Dimensions, mm: 223 x 195 x 80

Weight, kg : ~ 0.950

Functional characteristics

- Supports communication Protocol 2.1.
- Receipts, reports and messages in English or Swahili
- Programmable PLU database
- PLU barcodes and stock quantities - options
- 4 departments
- 10 operators
- 5 VAT categories
- 8 commodity groups with programmable names
- 10 programmable units of measure
- 5 types of payment
- Programmable receipt header – 8 lines
- Programmable receipt footer – 4 lines
- Printing of a graphic logo – 384 x 144 pixels
- Clients database - 500 clients
- Registration of discounts and mark-ups (percentage and value)
- Registration of received on account and paid out amounts
- Registration of purchases
- Reports – sends each fiscal receipt to FTP server of TRA:
  - ✓ PLU and PLU groups report; PLU stock quantities report
  - ✓ Commodity groups report; Departments report; VAT report
  - ✓ Operators report
  - ✓ Sales report
  - ✓ Daily X report and daily Z report
  - ✓ Daily Y report and weekly P report
- Fiscal memory reports:
  - ✓ Summary FM reports by dates or by Z numbers
  - ✓ Detailed FM reports by dates or by Z numbers
- Built-in tests

300SM

Technical characteristics

- Universal -suitable to be used in all kind of shops, restaurants etc.
- Fast and noiseless thermal printer
  - ✓ easy paper loading; auto-cutter; printing speed –150 mm/s; paper width –80 mm, paper roll diameter – 80 mm max.; characters per line – 48
- Fiscal memory –1850 records of daily Z reports
- OLED graphic display –22.4 x 5.6 mm; 128 x 32 pixels
- Micro SD memory card (4GB)
- GPRS communication module
- Interfaces –USB, two RS232, Ethernet (option)
- Communication with PC, external display and cash drawer
- Power supply external adapter –AC 100-240V, 50-60 Hz, DC 24V, 3A
- Lithium battery supporting the real time clock
- Dimensions(mm) –180 x 130 x 120
- Weight (kg) –0.850
- Operating temperature range: 0℃ to 45℃

Functional characteristics

- Supports communication Protocol 2.1
- Programmable PLUs
- 8 departments
- 10 operators
- 5 VAT groups
- 10 units of measure with programmable names
- 5 types of payment
- Programmable receipt header – 8 text lines
- Programmable receipt footer –2 text lines
- Programmable graphic logo–576 x 120pixels
- Registration of received on account and paid out amounts.
- Reports – sends each fiscal receipt to FTP of TRA:
  - ✓ PLU report
  - ✓ Operators report
  - ✓ Daily X report
  - ✓ Daily Z report
  - ✓ Daily Y report
  - ✓ Weekly P report
- Fiscal memory reports:
  - ✓ By record numbers – detailed and short
  - ✓ By dates – detailed and short reports

Built-in tests

900FM

Technical characteristics

- Fuel Pump Controller DSBi-440
  - ✓ Flexible hardware-interface configuration depending on the pump-type
  - ✓ Isolated circuit for galvanic separation from the fuel pump
  - ✓ Micro SD card - SDS Standard
  - ✓ Power Supply - AC 170-270 V, 50Hz
- Fiscal Controller
- Display & Keyboard Unit
  - ✓ Keyboard – capacitive, 24 keys
  - ✓ Display - blue graphic LCD 128 x 64 pixels, with backlight
  - ✓ Wi-Fi module
- Fiscal Printer Unit
  - ✓ Fast and noiseless thermal printer:
  - ✓ easy paper loading
  - ✓ auto-cutter
  - ✓ printing speed up to 150 mm/s
  - ✓ thermal paper: 80 mm wide, Ø max 80 mm
  - ✓ USB interface
  - ✓ GPRS modem for TRA data transfer
  - ✓ supporting user define FTP server through

  two SIM cards or 1 SIM x 2 APNs (optional)
  - ✓ Power Supply Adapter - AC 100-240V, 50-60 Hz, DC 24V / 3A
- Dimensions(mm) – 320 x 188 x 175
- Weight (kg) ~ 10.500
- Operating temperature range: 0℃ to 45℃

Functional characteristics

- Compliant with communication Protocol 2.1.
- Supporting various fuel-pump brands and protocols:
  - ✓ Tokheim-UDC
  - ✓ Gilbarco-TWI
  - ✓ Wayne-DART
  - ✓ IFSF-LON
  - ✓ Mekser-DART
  - ✓ Hong-Yang,
  - ✓ Midco,
  - ✓ TATSUNO, etc.
- Supporting double-sided fuel-pump device, up to 8 combined fuel nozzles / per side
- Wi-Fi module for connecting to back-end data concentrator
- Programmable filling nozzles: 2 sides x up to 8
- Remote updateable
- Programmable VATs
- Reports:
  - ✓ Reports by fuel types (up to 10 fuel types):
  - ✓ Daily fuel report
  - ✓ Report by filling nozzles
  - ✓ Periodical report by types of fuel
- TRA reports:
  - ✓ Daily X report
  - ✓ Daily Z report
- Fiscal Memory reports:
  - ✓ by record numbers
  - ✓ by dates

by months

600

Technical characteristics

- Internet capable: Wi-Fi, Ethernet, 3G
- Graphic OLED display
- Micro SD memory card (16 GB)
- Cryptographic module TPM 2.0
- Hardware tamper protection against unauthorizedinterventions
- USB interface
- Power supply external adapter —AC100-240V, 50- 60 Hz, DC 9V, 3A
- Dimensions (mm) –140 x 110 x 37
- Weight (kg) ~ 0.260
- Operating temperature range: 0ºC to 45ºC

Functional characteristics

- INCOTEX 600 is designed to be connected to existing traders systems
- INCOTEX 600 performs the functions of taxinvoices validation, encryption, signing, transmission and storage
- INCOTEX 600 supports the TIMS Protocol for communications with TIMS server
- The communication between the Control Unit and the TIMS Application server at KRA is over the Internet
- INCOTEX 600 is PKI compatible and supports RSA 2048 bit encryption/decryption algorithm based on TPM2.0FIPS140-2 certified hardware
- HS codes are supported
- Up to 8 VAT categories
- INCOTEX 600 supports update over the air from the manufacturer server of: PKI certificates, keys and security updates, HSC codes, VAT table, SSL version, Device firmware and OS
- The control unit generates a Control Code uniquely for each invoice in order that a unique QR Code is generated and included ineach invoice.
- Daily X report and End of day summary
- Extraction of encrypted invoice data
- Communication with a PC via USB
- Built-in diagnostic tests

4S4 METERING

ELECTRICITY METERS

PREPAID ELECTRICITY METERS

AUTOMATED METER READING (AMR)/ ADVANCED METERING INFRASTRUCTURE (AMI)

Automated Meter Reading (AMR)

Automated Meter Reading is a communication technology used by utilities to automatically collect consumptiondata from meters. AMR systems can be either walk-through or drive-through. The endpoint connects to the counter encoder register. The endpoint captures the power consumption and alarm data collected by utility personnel when passing or driving with a data receiver near the device.

Once collected, meter data is fed into a database where utilities can track and analyze usage, troubleshoot issues, and bill customers based on actual usage, rather than the forecasts that were often required when manually reading data every two months or quarterly.

Advanced Metering Infrastructure (AMI)

Advanced Metering Infrastructure is an integrated system of meters, communication networks, and data management systems that enables two-way communication between meter endpoints and utilities. Unlike AMR, AMI does not require utility personnel to collect data. Instead, the system automatically transmits data directly to the utility at preset intervals.

Meter data is transmitted to utilities via a fixed network. The utility can use this data to improve operational efficiency and sustainability by effectively monitoring water use and system efficiency, detecting faults, and recognizing violations.

With a fixed grid, utilities work with specific suppliers to get their infrastructure and technology up and running. And today, existing cellular networks designed to minimize downtime can be used to ensure secure and uninterrupted meterdata collection.

PLC

PURPOSE

PLC (Power Line Communication) technologies provide data transmission by power supply lines. There are several different PLC technologies: for data transmission over high-voltage power lines, telemetry data transmission and broadband data transmission over low-voltage networks.

The PLC technologies which provide a narrowband data communication within the frequency range CENELEC A (35 - 91 kHz, Europe), CENELEC B (98 - 122 kHz, some European countries) and FCC (155 - 487 kHz, USA) are used to build AMR/AMI systems. Currently there are standardized PLC PRIME and G3-PLC data communication technologies on the market that provide comparable characteristics, as well as a number of proprietary technologies.

G3-PLC Alliance

G3-PLC: The technology is also an international open standard focused on global application. The mesh network topology is used. The data transfer speed is not high, to 35 kbps (CENELEC)/128 kbps (ARIB).,

Advantages of the standard:

- transmission and uploading of IPv6 packets via the Internet with the ability to access each meter from anywhere in the world;
- operation with various types of equipment, not only with electricity meters.

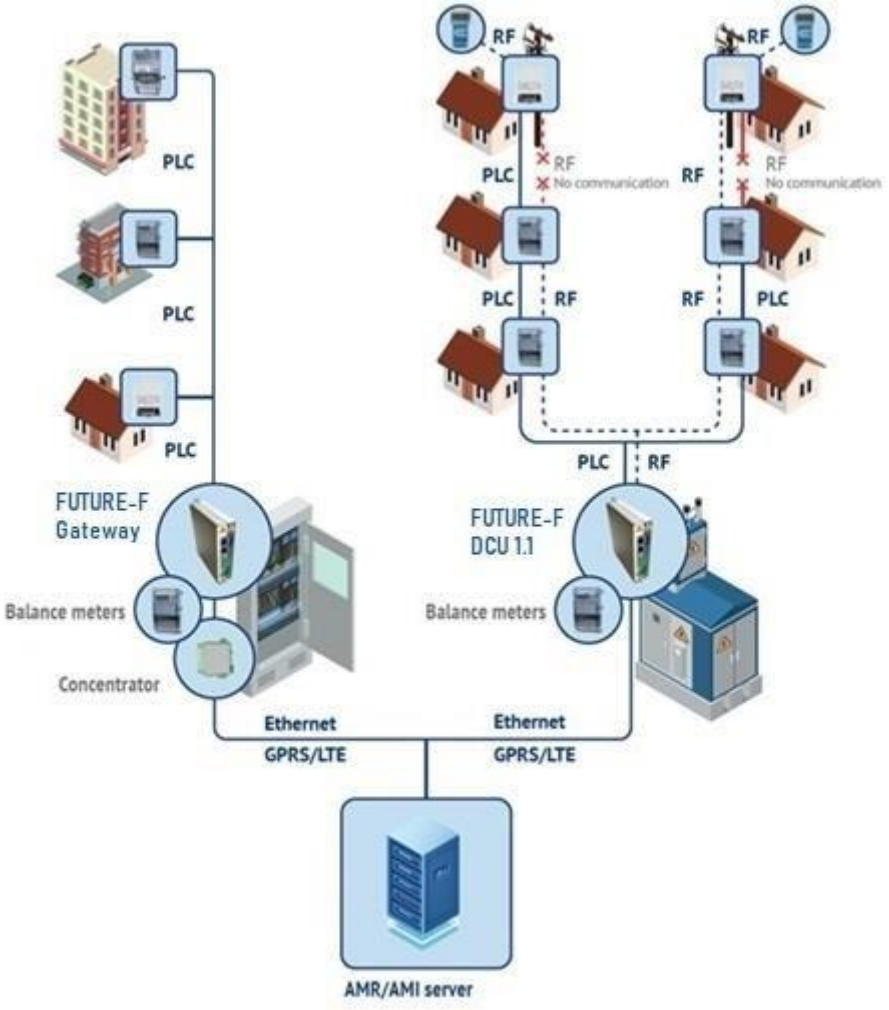
The average communication range (without retransmission) when using PLC is about 100 m, the maximum is 400 m. The communication range depends on the quality of the electrical network (the presence of twists, multiple soldering, etc.) and the presence of interference. The communication range practically does not depend on the communication technology used. The outdated systems provide a shorter range compared to the systems operating in a non-standard (prohibited) frequency range or exceeding the permitted power.

Additional advantages of G3-PLC+RF Hybrid:

- increase of noise immunity and throughput due to 'seamless' mutual redundancy of data transmission media;
- stable communication due to automatic selection of a better channel.

Advantages of PLC technologies

Extremely low deployment and operation costs. If there is a power supply line, there is a communication channel with a meter.



G3-PLC+RF Hybrid

The FUTURE-F meters with G3-PLC+RF Hybrid, PLC technologies

PURPOSE

GSM is an international standard of digital cellular communication based on which it is possible todeploy AMR/AMI in the existing mobile operators networks without creating own infrastructure, **which is the main advantage of such systems.**

Meters with two SIM-cards (DUAL SIM) are used to increase data transmission reliability. In this case, data can be transmitted, including from M slave meters connected to the master meter, via the RS-485 **interface.**

Advantages

- Use of different telecommunications operators services, redundancy
- Guarantee of stable operation: an automatic operator selection depending on the communication quality and signal level; data **retransmission after loss of communication**
- The minimal traffic with the software limitation possibility and auto setup according to a schedule and events with less than 1 MB per year depending on the settings
- The communication channel with anti-tampering protection
- Exchange with the Data Collection Center via a direct channel
- Data collection from 64 or more slave meters not equipped with a modem connected via RS-485 line

Features

- Capability to operate in a network with a ‘grey' IP address
- Simultaneous operation in the proactive transmission mode and in the ‘request-response' mode

Meters transmit data on demand; data transmission parameters are configured at the upper level, where the meter configurationand control functions are available. If there is no exchange via the direct channel, the proactive data transmission starts operating.

DATA COMMUNICATION TECHNOLOGIES

Code	Operating mode	SIM cards
G	GSM 2G (GPRS/EDGE)	1
G2	GSM 2G (GPRS/EDGE)	2
G3	GSM 3G (UMTS)	1
G4	GSM 4G (LTE)	1
G5	GSM 5G	1
G7	NBIOT	1
G8	combined GPRS+NBIOT	1

PURPOSE

The NB-IoT (NarrowBand Internet of Things) is a cellular communication standard for devices with a small amount of data. The existing mobile operators' infrastructure is used for the NB-IoT communication standard. The network is deployed inside the main LTE baseband or outside the baseband between neighboring LTE carriers.

Thus, the functions available in LTE are used in NB-IoT. The NB-IoT services are provided by mobile operators along with other services: voice mobile communication, high-speed LTE data transmission, etc.

Advantages

- The NB-IoT is an open world standard, all equipment is compatible, the devices operation does not depend on the operator and the region of use
- The NB-IoT standard is initially targeted at the B2B/M2M market, so it takes into account many features of the target market
- The technology is in demand and is actively developing and improving
- The coverage area of the main operators includes million-plus cities
- High-quality signal penetration owing to the use of low-frequency bands
- The sufficiently high speed of data exchange, allowing to build full-fledged AMR/AMI systems
- The large network capacity per base station, excellent network scalability and long range
- The optimal solution for devices with the proactive data transmission and traffic limitation capability
- The minimal traffic with the software limitation possibility and automatic schedule settings for traffic: less than 1 MB per year, depending on the settings
- The capability to build systems with a master-meter which polls several other meters via the RS-485 interface and to save traffic, as well as to reduce the cost of the system as a whole

Features

- High data transfer rate in comparison with other LPWAN networks
- The capability to use mobile operators' cloud platforms for data collection
- The prospect of switching from classic SIM cards to programmable eSIMs
- Moderate subscription fee

Electricity meters

Master meter FUTURE-F with NB-IoT technology

PURPOSE

LoRaWAN is a highly reliable standard for wireless low-power private networks in the unlicensed 868MHz band. It allows transmitting small amounts of data at a distance of up to 15 km in the line of sight and 1.5 - 2 km in densely built-up urban areas. The network topology is a classic star with the center at the base station. Within the same LoRaWAN network, there may be several base stations with a single network server that provides optimal communication with subscribers and load balancing in the network.

Advantages

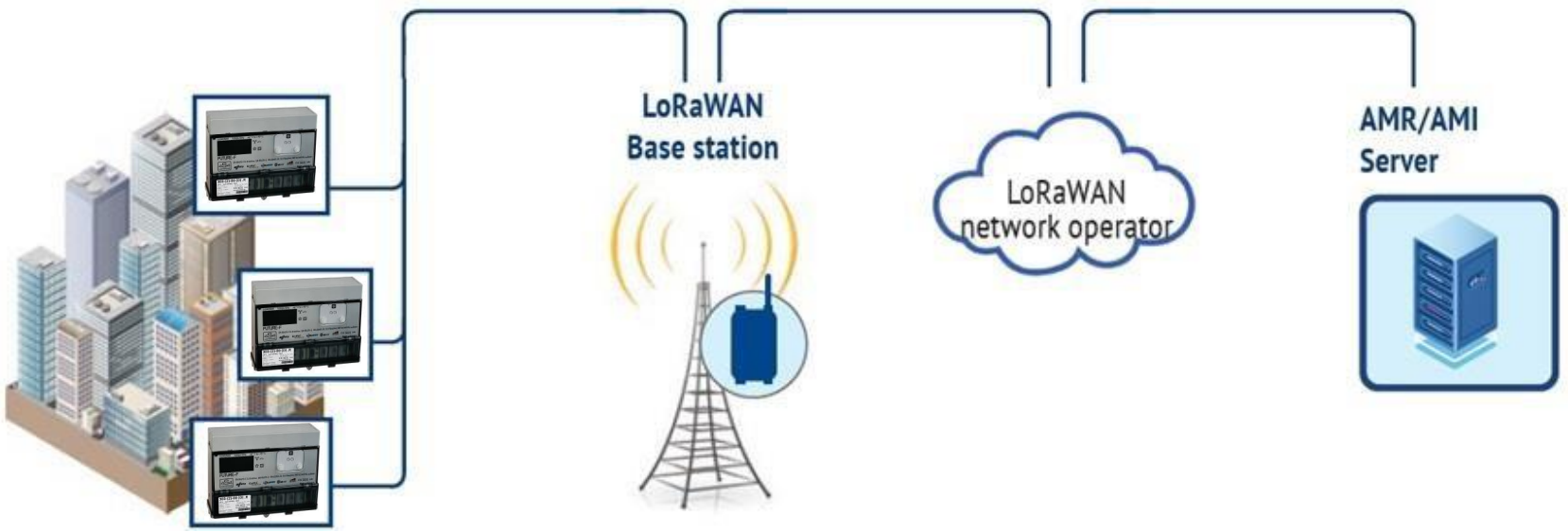
- No licensing required
- Open standard, availability of open-source hardware and software, independence from a specific manufacturer or telecom operator
- A network scalability to several hundred thousand devices by installing new base stations
- The two-way encrypted communication channel
- The capability to deploy both your own private network and use of existing LoRaWAN networks

Features

- The communication channel is asymmetric; the bandwidth from the devices to the base station is several times wider than in the opposite direction
- The channel is focused on the proactive data transmission

The implementation of LoRaWAN technology in FUTURE-F meters provides both proactive data transmission when an event occurs or according to a schedule, for example, the readings transmission at the beginning of the day or alarming events when a meter cover is opened and also their operation in the AMR/AMI 'request-response' mode.

Electricity meters



FUTURE-F Series 300- three phase energy meter

FUTURE-F300 series electricity meters are designed to measureand account for electricity consumption in three-phase networks.

General properties:

- Real-time measurements provide more detailed information about electricity use
- Accuracy class 1.0 and 0.5S (IEC 62053-22/22) for active energy measurement,
- Compliance with standards EN50470-1/3, IEC 61557-12, IEC 62053-21/22, IEC 62053-23
- Max electric current intensity - 100A
- Nominal voltage: 380 V
- Frequency - 50 Hz
- Operating temperature range from -40 ° C to + 70 °
- C.Ingress protection rating - IP51
- Availability of optical port for programming purposes and data reading
- For multiple-tariff performance: to 8 tariffs and 12 time zones with automatictransition to standard time fromdaylight saving time

Advantages:

- The design of the meter allows direct measurement ofcurrent up to 100 amperes.
- Summation of electricity consumption and distribution of costs by zone, type of use or by shift
- Measurements are basic electrical parameters to better understand the behavior of your power distribution system.
- Check the invoice to make sure you're only using the energy as metered
- The ability to set different tariffs, with a separate schedule for weekends and holidays.
- The meter fully complies with the requirements of international standards
- The electronic seal of the terminal cover, the current sensor in the neutral wire circuit, as well as the non- separable design of the meter with a voltage sensor, provide protection against attempts to steal electricity.
- The functionality of the meter fully meets the modern requirements of the residential and commercial construction segments.
- It is possible to use the counter as part of AIIS KUE and MDM
- Efficient monitoring of energy consumption with an event log that stores measured values for up to 12months.

FUTURE-F Series 100- single phase energy meter

FUTURE-F 100 series electricity meters are designed to measure and record electricity.

General properties:

- Real-time measurements provide more detailed information about electricity use
- Accuracy class 1.0 and 0.5S (IEC 62053-22/22) for active energy measurement,
- Compliance with standards EN50470-1/3, IEC 61557-12, IEC 62053-21/22, IEC 62053-23
- Max electric current intensity - 100A
- Nominal voltage: 200 V
- Frequency - 50 Hz
- Operating temperature range from -40 ° C to + 70 °
- C.Ingress protection rating - IP51
- Availability of optical port for programming purposes and data reading
- For multiple-tariff performance: to 8 tariffs and 12 time zones with automatictransition to standard time from daylight saving time

Advantages:

- The design of the meter allows direct current measurement up to
- 100 amperes
- The presence of a long terminal cover for fastening (accessory)
- Measuring basic electrical parameters for a better understanding of the behavior of your power distribution system
- Check the invoice to make sure you are only using energy as metered
- The ability to set different tariffs, with a separate schedule for
- weekends and holidays
- The meter fully complies with the requirements of international standards.
- The electronic seal of the terminal cover, the current sensor in the neutral wire circuit, as well as the non-separable design of the meter with the opening sensor, provide protection against attempts to steal electricity.
- The functionality of the meter fully meets the modern requirements of the residential and commercial construction segments.
- It is possible to use the counter as part of AMR and MDM. Efficient monitoring of energy consumption with an event log that stores measured values for up to 12 months.

4S4 Single-phase STS Smart Prepayment Energy Meter

Technical features

- Optical port and RS485
- RF interface for connection with CIU
- 4G NIC with fall back to 2G
- Built-in relay, commutation current 90A
- Indications for incorrect connection of current circuits
- Registration of meter case intrusion regardless of the presence or absence of power
- Magnetic field impact registration
- LCD with backlight
- OBIS code (by IEC 62056-61) for data identification
- Load management
- Time-of-use registration (up to 4 tariffs) and Block tariffs
- 20-digit STS encryption according to IEC 62055-41
- Protection against tampering
- Load Profile and Billing Profile
- Power Quality Monitoring
- Log book
- Adjustable power limit setting
- Over Power Limit warning
- Low credit warning
- The housing is made of plastic with excellent mechanical (providing sufficient strength and stable attachment of the nodes), thermal (fire resistant) and electrical performance.
- Customized Windows software for data parameterization and reading.

Purpose

The multifunctional energy meter is intended for one or bidirectional metering of active and reactive electrical energy and power in two-wired AC mains directly with the possibility of zone tariff metering, long time storage and transmission of collected information to information collection centers over digital interface wire or wireless communication channels.
STS has features of a prepaid electricity meter. The customer purchases energy in the form of tokens entered locally through the built-in keypad on the meter or through split Customer Interface Unit (CIU), or remotely via Head-end-system (HES).
STS integrates the sales system with AMI infrastructure for remote prepayment and meter reading, remote control, etc.
STS records the consumed electricity, performs credit management and has internal contactor for switching the load.

Regulatory documents

Compliance:
STS: IEC 62055-31, IEC 62055-41, IEC 62055-51
Directive 2014/32/EC: EN 50470-1, EN 50470-3
IEC 62053-21, IEC 62052-11, IEC 62053-23, IEC 62056-21
DLMS/COSEM

Technical specifications

Electrical and metrological data	Value
Accuracy class (active/reactive)	1,0 (B) / 2,0
Nominal voltage, V	230
Extended operating voltages (Unom=230V), V	138…253
Maximum operating voltage range, V	264
Rated (maximum) current, A	5(60)
Starting current for active energy measurement, A	0,02
Mains frequency, Hz	49…51
Active/apparent power consumption in voltage circuit, W/VA, max	2,0 /10,0
Apparent power consumption in current circuit, VA, max	4
Additional active/apparent power consumption of the 4G module, W	2
Rate Parameters	
Tariff number (TOU)	Max 4
Tariff Management	TOD and currency billing
Number of tariff intervals a day	16
Number of Seasonal timetables in a year	16
Specials Days	60
Built-in Clock Parameters	
Clock rate precision at t=20±5 °C, s / 24h	± 0,5
Pulse Output Parameters	
Galvanically isolated pulse output number	1 (programmable)
Meter constant, imp/kWh:	1000
Maximum allowed pulse output voltage, V	24
Pulse equipment Class A as per EN 62053-31	
Maximum allowed value of pulse output circuit current, mA	30
Digital Interface Parameters	
Built-in digital interfaces	Optical port, RS485
Digital interfaces in additional cards	4G NIC with fall back to 2G
Exchange rate through the optical port, bit/s.	9600
Exchange rate through RS485, bit/s.	300 – 115200
Exchange rate through 4G, DL/UL Mbps.	10/5
Exchange rate through RF Tx/Rx Kbps	50 / 50
User Interface	
Keypad	12 digit keypad with audio feedback
Display, height of the digits, mm	9
Load status indication, LED	yes
Tamper indication	yes
Built-in Relay Parameters	
Maximum load switched current of the built-in relay, A	90A
Protection Characteristics	
Sensors for open main and terminal cover	yes
Magnetic field impact sensor	yes
Password protection level number to access digital interfaces	2
Hardware protection of metrological coefficient memory	yes
Voltage or current disappearance registration	yes
Over current registration	yes
Meter self-diagnostics	yes
Mass and Dimensions	
Mass, max, kg	1
Overall sizes (height, width, depth), mm	221*112*76.5
Miscellaneous	
Enclosure protection degree	IP 54
Protective class	Class II (double insulated)
Operating temperature range, °C	-40 to +70
Storage temperature range, °C	-45 to +75
Diameter of current inputs / outputs terminals, mm	8,5
Connection scheme	BS 5685

4S4 Three-phase STS Smart Prepayment Energy Meter

Technical features

- Optical port and RS485
- RF interface for connection with CIU
- 4G NIC with fall back to 2G
- Built-in relay with 120A commutation current for each phase Indications for incorrect connection of current circuits
- Registration of meter case intrusion regardless of the presence or absence of power
- Magnetic field impact registration
- LCD with backlight
- OBIS code (by IEC 62056-61) for data identification
- Load management
- Time-of-use registration (up to 4 tariffs) and Block tariffs
- 20-digit STS encryption according to IEC 62055-41
- Protection against tampering
- Load Profile and Billing Profile
- Power Quality Monitoring
- Log book
- Adjustable power limit setting
- Over Power Limit warning
- Low credit warning
- The housing is made of plastic with excellent mechanical (providing sufficient strength and stable attachment of the nodes), thermal (fire resistant) and electrical performance.
- Customized Windows software for data parameterization and reading.

Purpose

The multifunctional energy meter is intended for 4 - quadrant metering of active and reactive electrical energy and power in three-phase 3 or 4-wired AC mains directly with the
possibility of zone tariff metering, long time storage and transmission of collected information to information collection centers over digital interface wire or wireless communication channels.
STS has features of a prepaid electricity meter. The customer purchases energy in the form of tokens entered locally through the built-in keypad on the meter or through split Customer
Interface Unit (CIU), or remotely via Head-end-system (HES).
STSintegrates the sales system with AMI infrastructure for remote prepayment and meter reading, remote control, etc.
STS records the consumed electricity, performs credit management and has internal contactor for switching the load.

Regulatory documents

Compliance:
STS: IEC 62055-31, IEC 62055-41, IEC 62055-51
Directive 2014/32/EC: EN 50470-1, EN 50470-3
IEC 62053-21, IEC 62052-11, IEC 62053-23, IEC 62056-21
DLMS/COSEM

Technical specifications

Electrical and metrological data	Value
Accuracy class (active/reactive)	1,0 / 2,0
Nominal voltage, V	230
Extended operating voltages (Unom=230V), V	138…253
Maximum operating voltage range, V	264
Rated (maximum) current, A	3x5(100)
Starting current for active energy measurement, A	0,02
Mains frequency, Hz	49…51
Active/apparent power consumption in voltage circuit, W/VA, max	2,0 /10,0
Apparent power consumption in current circuit, VA, max	4
Additional active/apparent power consumption of the 4G module, W	2
Rate Parameters	
Tariff number (TOU)	Max 4
Tariff Management	TOD and currency billing
Number of tariff intervals a day	16
Number of Seasonal timetable in a year	16
Specials Days	60
Built-in Clock Parameters	
Clock rate precision at t=20±5 °C, s / 24h	± 0,5
Pulse Output Parameters	
Galvanically isolated pulse output number	1 (programmable)
Meter constant, imp/kWh:	1000
Maximum allowed pulse output voltage, V	24
Pulse equipment Class A as per EN 62053-31	
Maximum allowed value of pulse output circuit current, mA	30
Digital Interface Parameters	
Built-in digital interfaces	Optical port, RS485
Digital interfaces in additional cards	4G NIC with fall back to 2G
Exchange rate through the optical port, bit/s.	9600
Exchange rate through RS485, bit/s.	300 – 115200
Exchange rate through 4G, DL/UL Mbps.	10/5
Exchange rate through RF Tx/Rx Kbps	50 / 50
User Interface	
Keypad	12 digit keypad with audio feedback
Display, height of the digits, mm	9
Load status indication, LED	yes
Tamper indication	yes
Built-in Relay Parameters	
Maximum load switched current of the built-in relay, A	120A
Protection Characteristics	
Sensors for open main and terminal cover	yes
Magnetic field impact sensor	yes
Password protection level number to access digital interfaces	2
Hardware protection of metrological coefficient memory	yes
Voltage or current disappearance registration	yes
Over current registration	yes
Meter self-diagnostics	yes
Mass and Dimensions	
Mass, max, kg	1,6
Overall sizes (height, width, depth), mm	240*170*90
Miscellaneous	
Enclosure protection degree	IP 54
Protective class	Class II (double insulated)
Operating temperature range, °C	-40 to +70
Storage temperature range, °C	-45 to +75
Diameter of current inputs / outputs terminals, mm	8,5
Connection scheme	Asymm. 3-phase terminal configuration

Customer interface unit (CIU)

- The remote keyboard 4S4-CIU, also called Customer Interface Unit (CIU), is a separate device from the 4S4 prepaid energy meter, which is called Measurement and Control Unit (MCU).
- Clients can use the CIU to check data, recharge their meter or exchange information at any time of their convenience.
- The connection between MCU and CIU is a RF interface. The distance between the two units is up to 1000 m.

Basic function of CIU

- Loads the meter with a token of pre -purchased units of credit, without loss of any existing credit balance
- Transfers the credit in kWh
- Displays items stored in the MCU when an appropriate code is keyed
- Displays the cumulative kilowatt-hour register
- Indicates token acceptance or rejection
- Gives 'low credit' warning when a low credit threshold is reached.

Model Customer Interface Unit **4s4-CIU**

Keypad	12 digit keypad with audio feedback and Braille sign
Communication with MCU	RF interface
Communication Distance	Up to 1000 m
Power Supply	4 batteries x 1.5V
Exchange rate through RF Tx/Rx	50 / 50 Kbps
Display with Backlight	LCD
Digit height	9 mm
LED indication	Yes, 3 LEDs
Operating temperature range	-40°C to +70°C
Storage temperature range	-45°C to +75°C
Operating Environment Humidity	Tropical climatic conditions Average annual relative humidity – up to 90%
Dimensions (height, width, depth), mm	147/82/35

Indications on the CIU screen

- Incorrect token / Duplicate token / Token expired / Token rejected
- Tampered state
- Token credit overflow
- Communications error between MU and CIU
- Remaining Credit
- Total Consumption to Date
- Power limit
- The current Supply Group Code and Tariff index
- Visible indication of the status of the incoming supply
- Visible indication of the status of the load circuit-switching device

4S4 LIGHTING

LED Lighting:
Street and Road
Park
Office
Commercial and decorative
Industrial
Auxiliary
LED Lamp

Luminaire Control System

Custom-made Options

Power, W	Any within the range of 50– 155
Standard CRI	80
Color temperature, K	2,700- 6,500
Mount Fitting	60R – adjustable for 60 mm consoles 48, 60, 76 – non-adjustable for 48, 60 and 76 mm consoles
Control	System Ready – can be connected to a lighting management system
LDC	Wide Asymmetric TYPE 5; TYPE 2; Cosine 120°

Table of Standard Options

Series	Power range, W	Standard power, W	Luminous Flux, lm	Size, mm LxWxH	Weight, kg
MAG3-018-112	10-18	15	2,200	555x105x104	2,9
MAG3-030-112	20-30	27	3,840	555x105x104	2,9
MAG3-045-124	35-45	45	6,340	645x105x104	3,8
MAG3-060-124	50-60	54	8,200	645x105x104	3,8
MAG3-085-136	70-90	80	11,750	805x105x104	4,7
MAG3-105-148	100-120	100	15,220	901x105x104	5,3
MAG3-135-160	125-155	130	19,500	997x105x104	5,8

Custom-made Options

Power, W	Any within the range of 50– 155
Standard CRI	80
Color temperature, K	2,700- 6,500
Mount Fitting	60R – adjustable for 60 mm consoles 48, 60, 76 – non-adjustable for 48, 60 and 76 mm consoles
Control	System Ready – can be connected to a lighting management system
LDC	Wide Asymmetric TYPE 5; TYPE 2; Cosine 120°

Table of Standard Options

Series	Power range, W	Standard power, W	Luminous Flux, lm	Size, mm LxWxH	Weight, kg
MAG31-085-136	70-90	75	12,400	585x105x104	3,8
MAG31-105-148	100-120	105	17,400	695x105x104	4,7
MAG31-135-160	125-155	130	21,500	800x105x104	5,3
MAG31-135-160	125-155	155	25,570	910x105x104	5,3

Custom-made Options

Power, W	Any within the range of 180– 320
Standard CRI	80
Color temperature, K	2,700- 6,500
Mount Fitting	60R – adjustable for 60 mm consoles 48, 60, 76 – non-adjustable for 48, 60 and 76 mm consoles
Control	System Ready – can be connected to a lighting management system
LDC	Wide Asymmetric TYPE 2

Table of Standard Options

Series	Power range, W	Standard power, W	Luminous Flux, lm	Size, mm LxWxH	Weight, kg
MAG4-160-236	140-200	200	30,000	800x205x101	6,6
MAG4-215-248	210-250	250	37,500	900x205x101	7,2
MAG4-270-260	260-300	300	45,000	1000x205x101	7,9

Custom-made Options

Power, W	Any within the range of 180– 320
Standard CRI	80
Color temperature, K	2,700- 6,500
Mount Fitting	60R – adjustable for 60 mm consoles 48, 60, 76 – non-adjustable for 48, 60 and 76 mm consoles
Control	System Ready – can be connected to a lighting management system
LDC	Wide Asymmetric TYPE 3

Table of Standard Options

Series	Power range, W	Standard power, W	Luminous Flux, lm	Size, mm LxWxH	Weight, kg
MAG41-160-236	140-200	200	33,400	830x205x101	6,7
MAG41-215-248	210-250	250	41,800	940x205x101	7,4
MAG41-270-260	260-300	300	50,000	1050x205x101	8

Custom-made Options

Power, W	Any within the range of 10-90
Standard CRI	80
Color temperature, K	2,700- 6,500
Mount Fitting	60R – adjustable for 60 mm consoles 48, 60, 76 – non-adjustable for 48, 60 and 76 mm consoles
Control	The luminaires are equipped with a built-in modem 4S4 mod.CR or modem 4S4 mode.CB and suppliedas System Ready
LDC	Wide Asymmetric TYPE 3

Table of Standard Options

Series	Power range, W	Standard power, W	Luminous Flux, lm	Size, mm LxWxH	Weight, kg
MAG10-025	10-30	25	3,500	229x126x34	0,65
MAG10-050	35-50	40	5,600	229x126x34	0,65
MAG10-050	35-50	50	8,400	229x126x34	0,65
MAG10-070	50-60	70	9,800	334x126x34	0,85
MAG10-090	70-90	90	12,600	334x126x34	0,85

Street 56

LedPark01

BALL400

Table of Standard Options

Series	Standard power, W	Luminous Flux, lm	Size, mm LxWxH	Weight, kg
STREET56-055	55	6,050	540x540x720	8
LedPark01-028	28	3,080	370x370x670	7
LedPark02-075	75	8,250	440x440x770	7,8
BALL400-060	60	6,600	400x600	4,5

SLIMPANEL.3

SLIMPANEL.5

Table of Standard Options

Series	Standard power, W	Luminous Flux, lm	Size, mm LxWxH	Weight, kg
SLIMPANEL.1	8	1,120	295x295x17	0,8
SLIMPANEL.2	15	1,950	295x595x17	1,3
SLIMPANEL.3	24	3,480	595x595x17	2,4
SLIMPANEL.4	24	3,480	625x625x17	2,7
SLIMPANEL.5	24	3,480	295x1195x17	2,6
SLIMPANEL.6	48	6,960	595x1195x17	5

SLIMDISC

Custom-made Options

Mount fitting	Recessed / surface-mounted (bulkhead); Suspended
LDC	Cosine D

Table of Standard Options

Series	Standard power, W	Luminous Flux, lm	Size, mm WxH	Weight, kg
SLIMDISC	12	1,560	375x35	0,72

Custom-made Options

Standard CRI	90
Color temperature, K	3000- 5000K
LDC	Asymmetric TYPE 1; Asymmetric TYPE 2; Cosine 120°
Mount fitting	Vertical cables; 2 and more side by side; as a light line

Table of Standard Options

Series	Standard power, W	Luminous Flux, lm	Size, mm LxWxH	Weight, kg
LINEMALL 15	15	2,000	580x28x40	0,36
LINEMALL 23	23	3,000	1,200x28x40	0,72
LINEMALL 46	46	6,000	2,400x28x40	1,44

SPOT

Table of Standard Options

Series	Standard power, W	Luminous Flux, lm	Size, mm WxH	Mountibg hole size, mm	Weight, kg
SPOT	8	950	95x32	85	0,178

Custom-made Options

Standard CRI	90
Color temperature, K	3000- 5000K
Housing	Customized housing painting in accordance with RAL standard
LDC	Cosine 120°

Table of Standard Options

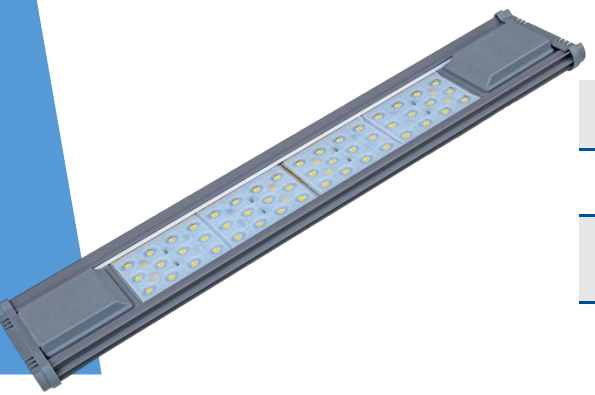
Series	Standard power, W	Luminous Flux, lm	Size, mm LxWxH	Weight, kg
LINE.V 15	15	1,800	600x100x35	0,75
LINE.V 30	30	3,600	1200x100x35	1,45

Custom-made Options

Power, W	Any within the range of 70-170; 215; 240; 270; 430
Standard CRI	80
Color temperature, K	3000- 5000K
Mount Fitting	On the wall or ceiling with a linear swivel mount fitting; On vertical cables
LDC	Cosine 120°; Deep 60°

Table of Standard Options

Series	Power range, W	Standard power, W	Luminous Flux, lm	Size, mm LxWxH	Weight, kg
INDUSTRY.3-085-136	70-90	75	11,250	422x240x138	2,6
INDUSTRY.3-105-148	95-120	105	15,750	518x126x138	3,7
INDUSTRY.3-135-160	125-140	130	19,500	614x126x138	4,3
INDUSTRY.3-160-236	150-170	155	23,250	422x240x138	4,9
INDUSTRY.3-215-248	215	215	32,250	518x240x138	7,6
INDUSTRY.3-240-336	240	240	36,000	422x347x138	9
INDUSTRY.3-270-348	270	270	40,500	422x347x138	11,2
INDUSTRY.3-430-448	430	430	61,950	522x455x138	17,5

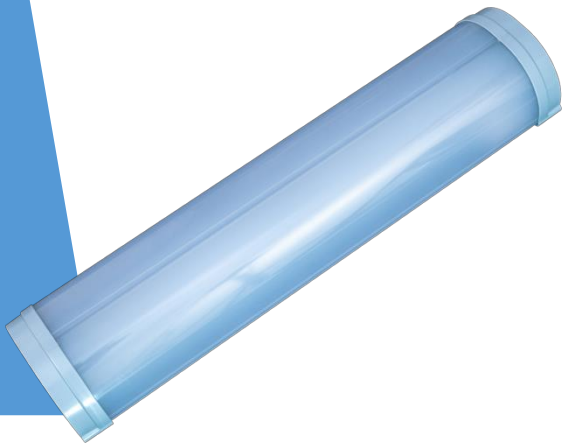


Custom-made Options

Power, W	60;100;120;140
Standard CRI	80
Color temperature, K	3000- 5000K
Mount Fitting	On the wall or ceiling with a linear swivel mount fitting; On vertical cables
LDC	Cosine 120°; Deep 60°

Table of Standard Options

Series	Standard power, W	Luminous Flux, lm	Size, mm LxWxH	Weight, kg
INDUSTRY.10-060	60	7,500	316x126x35	0,82
INDUSTRY.10-100	100	12,500	612x126x35	1,2
INDUSTRY.10-120	120	15,000	612x126x35	1,2
INDUSTRY.10-140	140	17,500	612x126x35	1,2



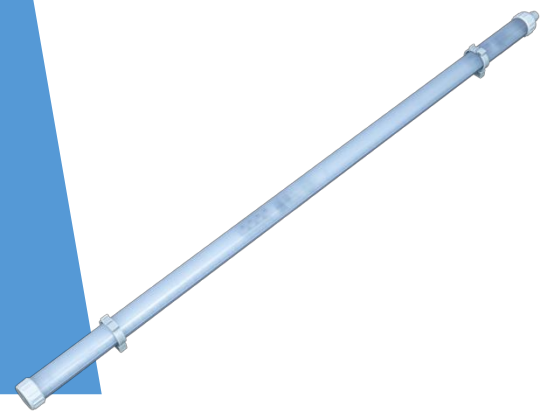
Custom-made Options

Power, W	Any within the range of 10-55
Standard CRI	80
Color temperature, K	3000- 5000K
LDC	Cosine 120°

Table of Standard Options

Series	Power range, W	Standard power, W	Luminous Flux, lm	Size, mm LxWxH	Weight, kg
LINE.PROM.A-15-030	10-55	30	7,500	600x155x90	0,8
LINE.PROM.A-15-060	10-55	50	12,500	1200x155x90	1,5
LINE.PROM.C-15-030	10-55	30	15,000	600x155x90	0,8
LINE.PROM.C-15-060	10-55	50	17,500	1200x155x90	1,5

Both LINE.PROM.A and LINE.PROM.C can be equipped with a light sensor at all standard power modes.



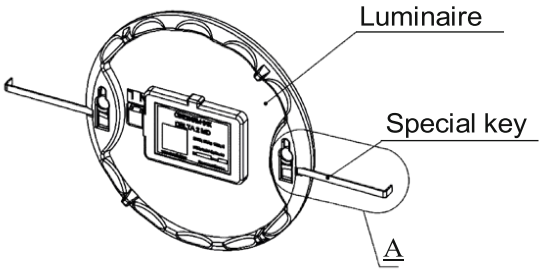
Custom-made Options

Color temperature, K	3000- 5000K
Mount Fitting	On surface;On vertical cables
LDC	Cosine 130°

Table of Standard Options

Series	Standard power, W	Luminous Flux, lm	Size, mm WxH	Weight, kg
INDUSTRY.T30-020	20	2,600	36x1000	0,36
INDUSTRY.T30-030	30	3,900	36x1500	0,72
INDUSTRY.T30-040	40	5,200	36x2000	1,44

Mount Fitting



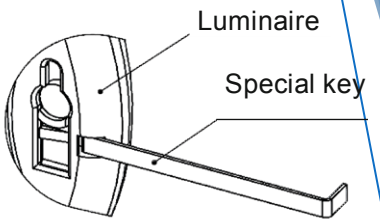
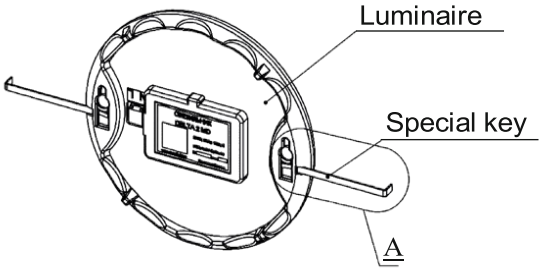


Table of Standard Options

Series	Standard power, W	Luminous Flux, lm	Size, mm WxH	Weight, kg
DELTA.3	18	2,340	235x235x40	0,45

Mount Fitting



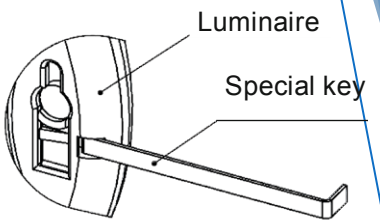


Table of Standard Options

Series	Product Code	Standard power, W	Luminous Flux, lm	Size, mm WxH	Weight, kg
ROLLAMP	7-61-020-05-0-52-22-905-8-40-54	20	2,900	73x225	0,16
ROLLAMP	7-61-035-05-0-52-22-905-8-40-54	35	5,075	73x225	0,16
ROLLAMP	7-61-045-05-0-52-22-912-8-40-54	45	6,525	73x245	0,19
ROLLAMP(S)	7-61-045-05-0-51-22-912-8-40-54	45	6,525	73x245	0,19

(S) – sectoral light emission.
IP54 and reduced power – it corresponds to lamps with sealed covers.

4S4 LED drivers

SY- Lighting

Standard

Industrial

Low Profile

PRO

HV

Long Life

HT

parameters	STANDARD	INDUSTRIAL	LOW PROFILE	PRO	SY-LIGHTING	HV	LONG LIFE	HT
Output power range, W	35-105	75-320	32-60	35-160	250-2500	35-160	70-275	75-320
Management	PWM / 1-10 / R	PWM / 0-10 / R	PWM / 0-10 / R	PWM / 0-10 / R	PWM	PWM / 0-10 / R	DALI-2	PWM / 0-10 / R
IP	67	67	20	67	67	67	67	67
Resistance to MIP, LN/LN-GND, kV	4/4	4/6 var.1 6/10 var.2	2/4	6/10	1/2 var.1 2-4 var.2	4/6	6/10	4/6 var.1 6/10 var.2
Housing operating temperature, C	-40 - +70	-60 - +85	-40 - +60	-60 - +85	-40 - +85	-40 - +85	-40 - +85	-60 - +105
Ambient temperature, C	-40 - +50	-60 - +65	-40 - +50	-60 - +65	-40 - +65	-40 - +65	-40 - +65	-60 - +85
Warranty, years	5	5-7	5	5	10	5	7-10	5-7
Certification	+	+	-	+	-	+	-	+

4S4net- 1

Fig. 1 shows the diagram of a simple movement system – 4S4net-1 (mainly in retail).

All luminaires have 4S4 mod.CR modems programmable to control the driver via PWM.The system is configured using a smartphone that has the 4S4net Manager software application. The 4S4 USB modem is connected to the USB port of the smartphone.
Luminaires that can be used in this option of 4S4net-1: MAG10 with the AC-Direct driver.

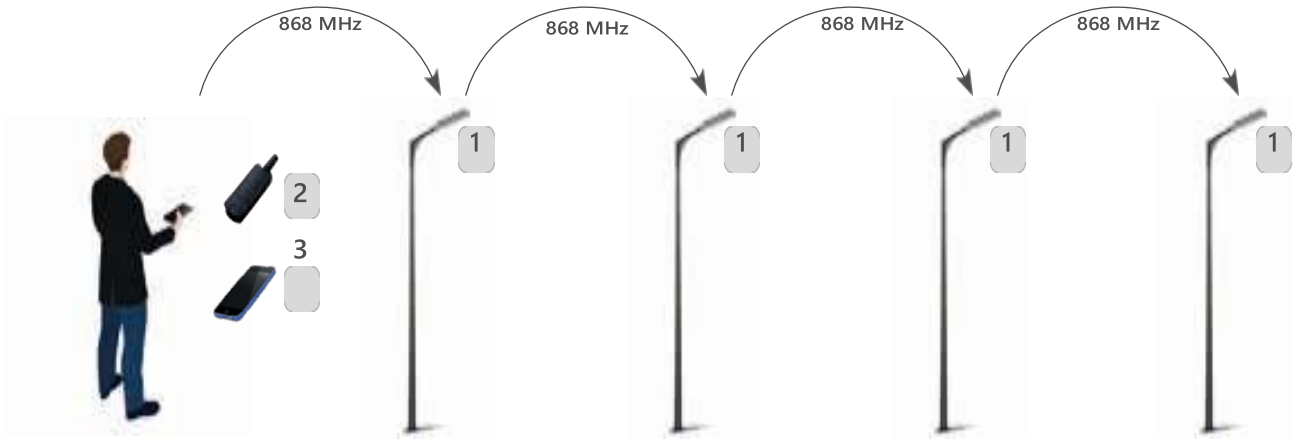


Fig. 1
4S4net-lighting management diagram

1. 4S4 mod.CR modem on each luminaire.
2. 4S4 USB modem.
3. Smartphone with **4S4net Manager**

Fig. 2 shows the 4S4net-2 diagram for retail when the customer has several segments that are remote from each other. Here, the 4S4 master.ZRG module on MAG31 is used as a controller. The rest of the luminaires have 4S4 mod.CR modems. The controller can controla network of luminaires via a smartphone or PC using the 4S4net Lite software.

This option of 4S4net-2 can use the following luminaires:
MAG10 with the AC-Direct driver and MAG31 with the STANDARD.

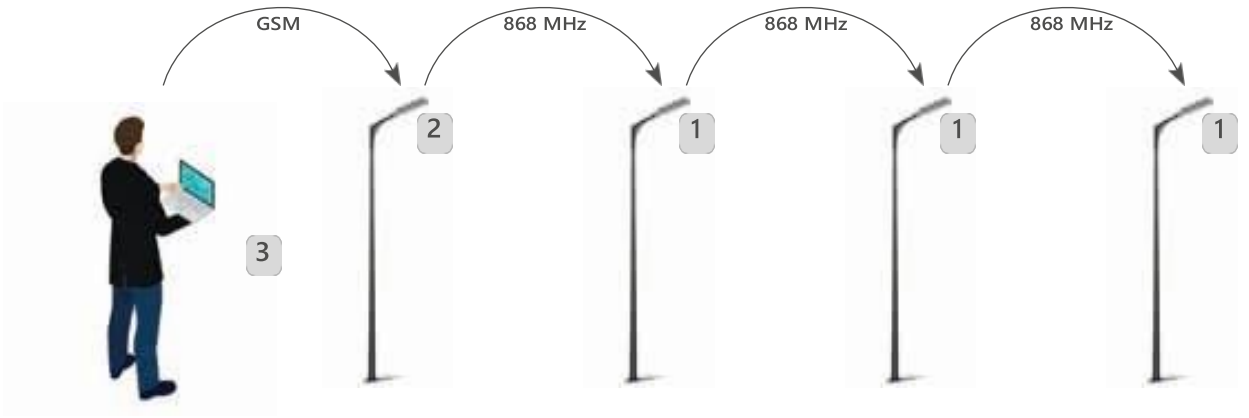


Fig. 2
4S4net-2 lighting management diagram

1. 4S4 mod.CR modem on each luminaire.
2. Controller 4S4 master.ZRG.
3. Smartphone or PC with **4S4net Lite** software.

4S4net- 3

Fig. 3 shows the management diagram of a segment of the large 4S4net-3 system withcontrol modules in the NEMA 4S4 mod.NR housing and controller 4S4 master.NRG. This system can only be supplied optionally and used with MAG33 luminaires and imported drivers. The net is managed from the Center through via a GSM channel. The software is 4S4net Professional.

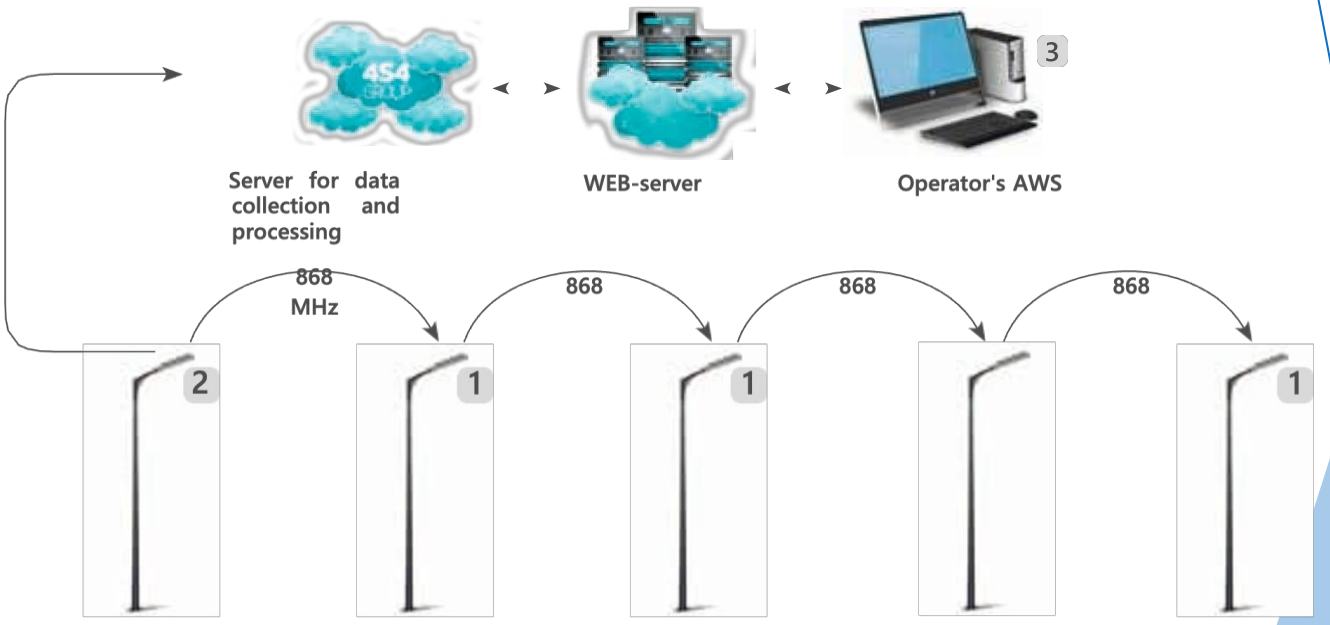


Fig. 3
4S4net-3 segment management diagram

1. 4S4 mod.CR modem on each luminaire.
2. Controller 4S4 master.ZRG.
3. Smartphone or PC with **4S4net Lite** software.

Fig. 4 shows a management diagram similar to the previous one. The 4S4net-4 system uses MAG32 and MAG42 luminaires with control modules in the Zhaga 4S4 mod.ZR housing and an 4S4 master.ZRG controller. Communication between the luminaires is provided via RF, and control and feedback – via GSM. The software is 4S4net Professional.

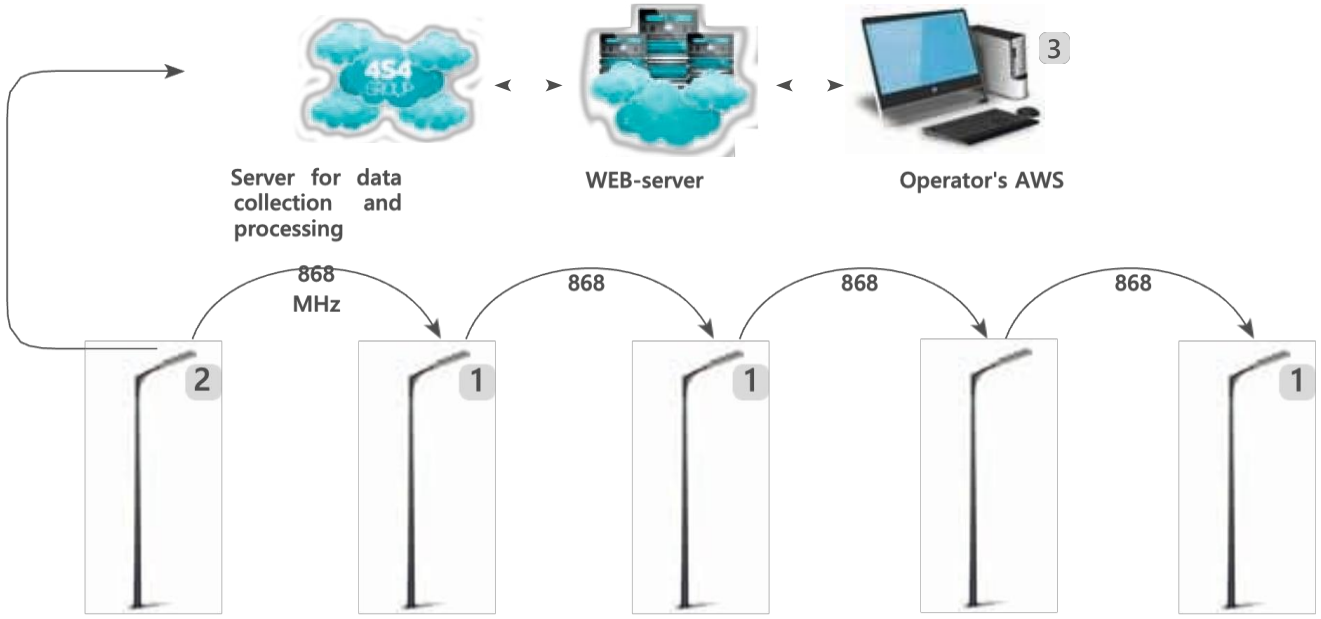


Fig. 4
4S4net-4 segment management diagram

1. 4S4 mod.ZR modem in Zhaga housing on each luminaire.
2. Controller 4S4 master.ZRG.
3. **4S4net Professional** software.

4S4net- 5

Fig. 5 shows a management diagram applied on a large and responsible scale (large village, city, highway, etc.). 2 branches of luminaires are shown schematically, but the circuit can include much more ones (up to 500 luminaires per segment). Communicationbetween the luminaires is normally made via RF868 and the control and feedback between the Center and the segments – via a GSM modem.

As in all schemes, a GPS module is installed in each modem and controller. In case of failure in the general system, each luminaire will operate according to its internal programguided by the time received from GPS/Glonass. 4S4net-5 uses state-of-the-art LONG.
LIFE drivers (warranty up to 10 years) without electrolytic capacitors. They may include anelectric energy meter. LONG LIFE communicates with modems and controllers via
the Zhaga connector installed directly on the driver housing or via OLCC with an 4S4 CUcontroller. The connection to the modem is provided via the Dali-2 interface powered by 24 V.The system is controlled from the Center with 4S4net Professional software.

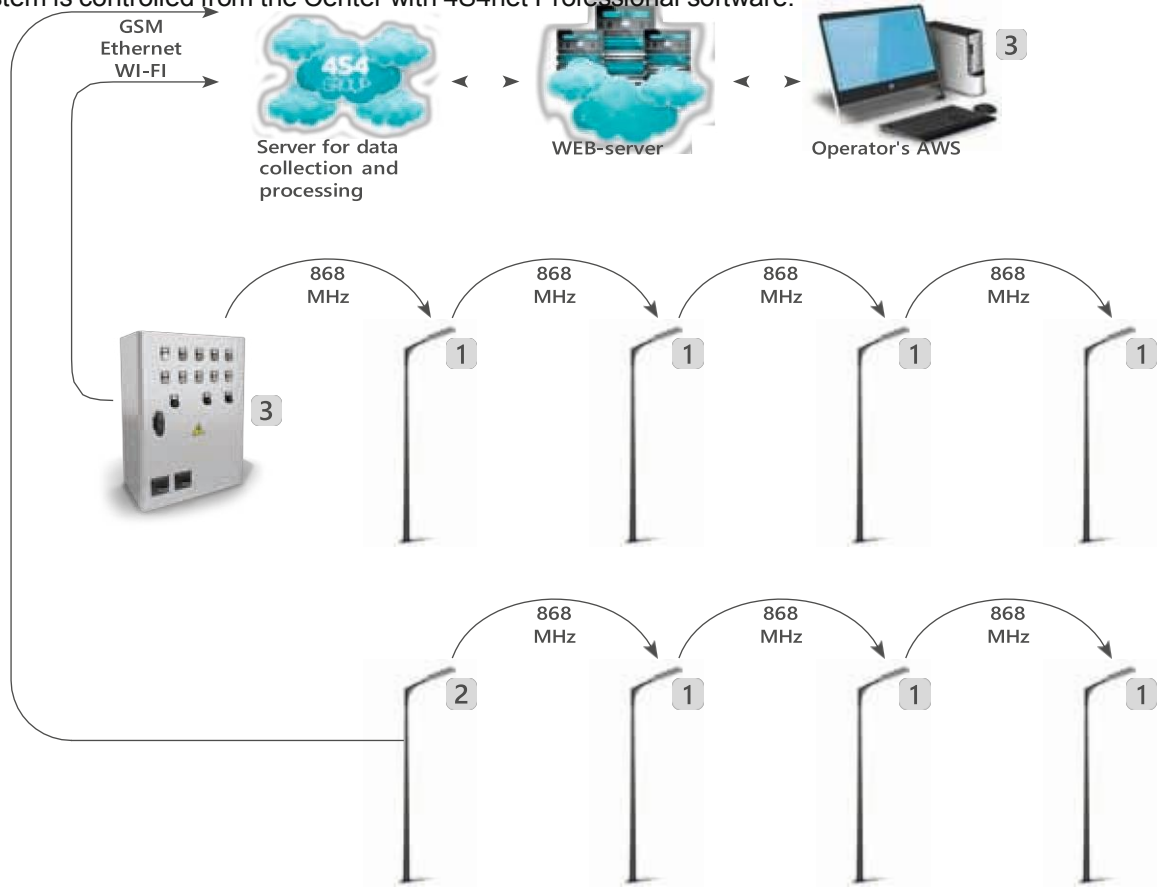


Fig. 5
Schematic segments of the **4S4net-5** management system

1. An 4S4 mod.ZRD modem in Zhaga housing is on eachluminaire.
2. Segment controller 4S4 master. ZRGD.
3. Segment controller 4S4 CU.