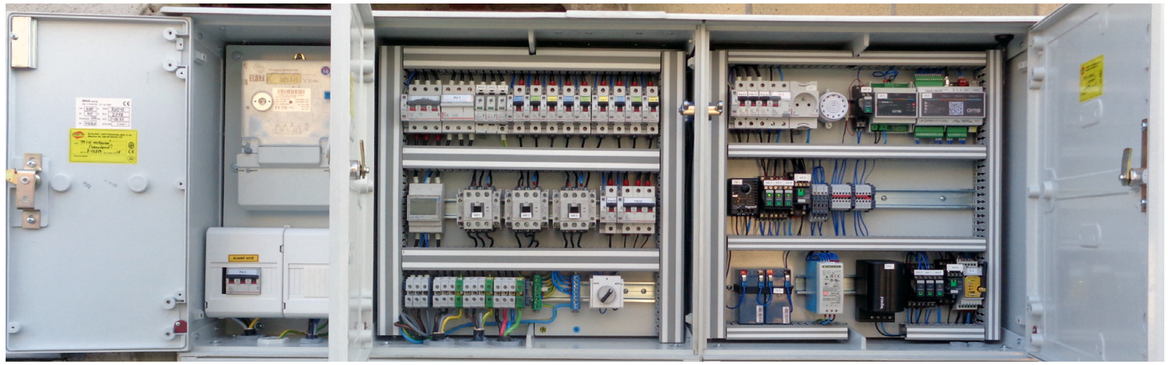
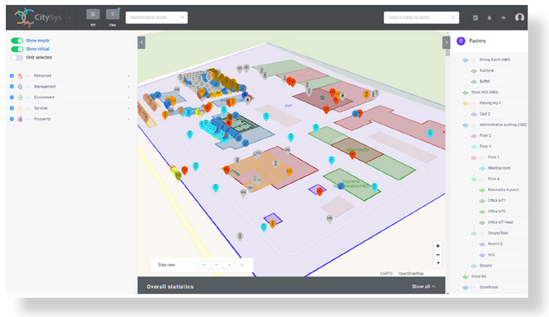
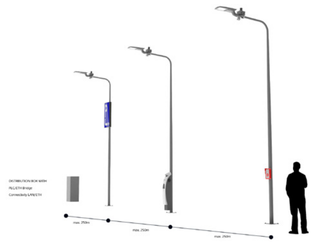
Electrical Distribution Box

CitySys EDB - A Gataway to Smart Cities







CitySys EDB creates bases for data control and collection through public lighting network. which is an ideal solution to build smart city infrastructure thanks to its unique features.

Software visualization on the CitySys platform provides complete control and monitoring of all collected data in a friendly user environment via web interface. It is an integrated component of the CitySys solution, which also includes other services for the city or municipality such as public lighting, parking, transport, waste management and much more. EDB is a part of city information panel, which creates a digital twin of the city - everything in the city is visualized on map background.

The collection, transfer and evaluation of data are secured via the complex management system CitySys based on the ThingsBoard IoT platform in the OPC standard. Open platform communication (OPC) represents a series of specifications from suppliers and software developers which define the interface between the clients and servers including the real-time access to data, monitoring of crisis situations, access to historical data and other applications. Its hardware offers a direct connection through standard interface and protocols, specifically: Powerline, Bluetooth, KNX, Z-Wawe, ModBus RTU/TCP, BACnet IP, EnOcean, DMX, M-Bus, GSM, 1-weire and DALI. It also offers the standardized interface REST API.

Communication between lighting devices is carried out though an electrical system. This means that the communication signal is transfered through the standard 230 V supply network. With regard to the connection to systems of the third parties, i.e. with systems already integrated in the city, the CitySys is open for communication protocols MQTT, JSON, XML, XMPP, SMP and RSS. Collected data is stored on a cloud server.

REMOTE CONTROL

The system is controlled and monitored remotely. Our solution ensures continuous monitoring of devices´ status and sends an email or SMS notification to the administrator in case of any change. For example, in a dropped circuit breaker situation, the network administrator can identify problem remotely. The message gets to him immediately, which gives him an opportunity to solve situation in a shorter time than if he relies on reporting failures by citizens. The solution also includes possibility of remote switching on and off of the individual contractors.

Remote control

Security

Information

Connectivity

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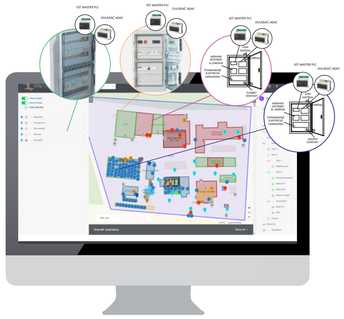
CONNECTIVITY

CitySys EDB creates and efficient Edge layer while combining a variety of different communication technologies such as: wired connection, 2G/3G/LTE, PLC, RF, NB-IoT and more. It provides an option to connect other SMART solutions within an existing network - smart lighting, waste management, traffic and parking sensors and other.



INFORMATION

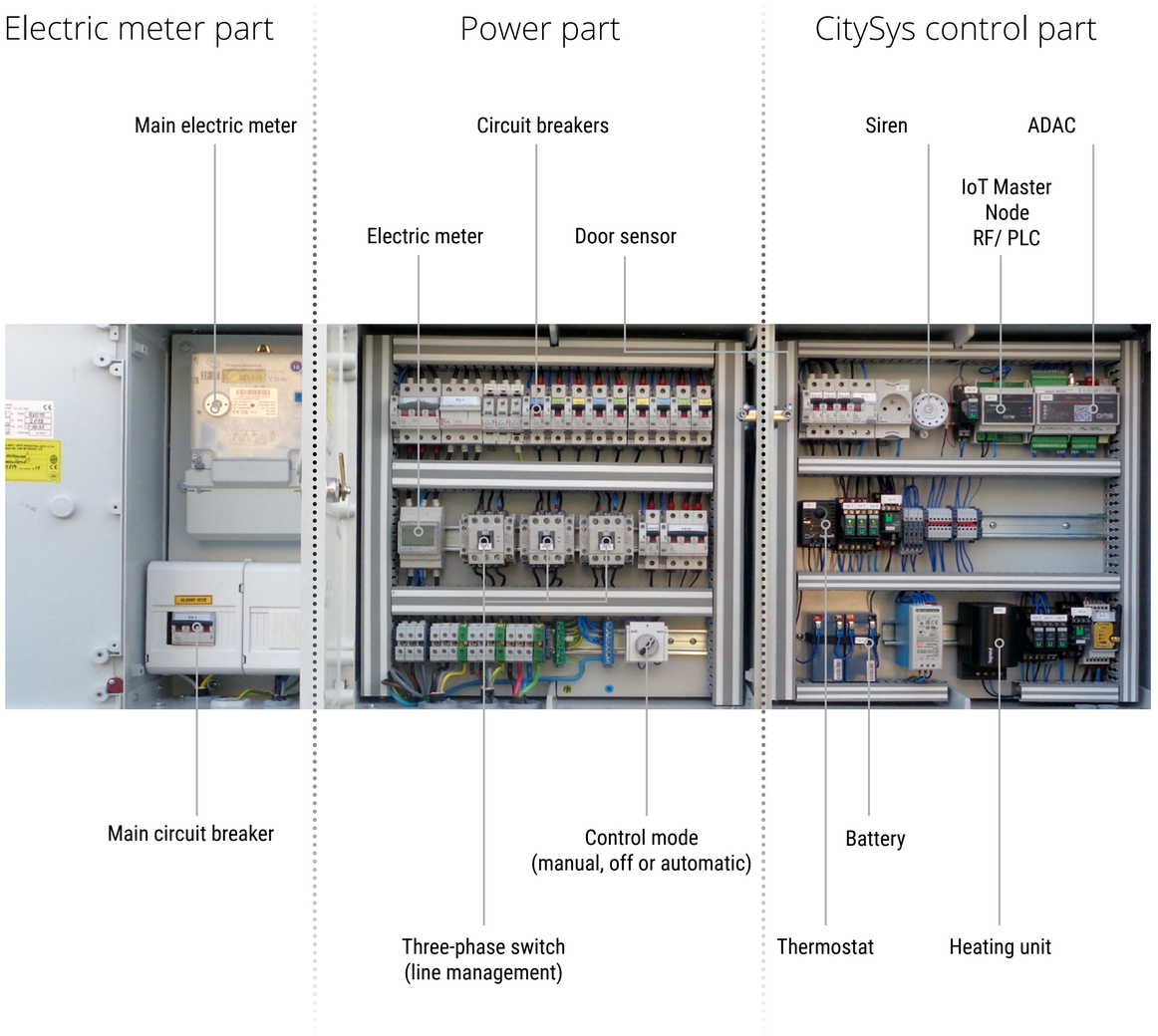
The platform provides accurate and up-to-date information about the whole EDB and its state (circuit breakers, power consumption, mains voltage and more). Information is available from anywhere, 27/7, through the application with responsive environment. The application can be controlled from a PC, tablet or mobile phone. You can compare real consumption for individual EDBs or consumption as a whole against invoiced. By this way, system allows you to respond to incurred differences or identify unauthorized purchases immediately and not after the invoice has been billed.

CERTIFIED ISO 27001 CERTIFIED

CERTIFIED ISO 27018 CERTIFIED

SECURITY

Communication and transfer of information is secured by encryption. Afterwards, the data is stored in a secure environment. The entire data and communication infrastructure is ISO 27001 and ISO 27018 certified. Physical protection
of individual EDBs is provided by a door sensor that sends an alert in the event of n intrusion attempt and triggers a siren built in the EDB.



Electrical Distribution Box

Components

ADAC

- control unit which enables additional installation of SMART solutions
- synchronized with CitySys platform
- integrated Ethernet, USB, GSM and other inputs
- lighting management

IoT Master Node RF/ PLC

- possibility of additional installation into EDB
- management of „slave nodes" placed in lighting devices
- communication between lighting devices and ADAC control unit
- PLC or RF communication

Electric meter

- MID Annex MI-003 certified
- three-phase electric meter
- accuracy ±0.5% RDG (current/voltage)
- IP51 protective level

Door contact - alert the operator when someone tries to open device without authorization

Battery - temperature measuring and regulation through heating unit placed near IoT devices backup power source in the event of power failure

Siren - unauthorized/ violent intrusion alert

Resistance Heater - Heat regulation for cabinets and enclosures - heating and regulation

Digital Temp Sensor - Waterproof digital temperature sensor

ADAC	
Power supply	2 x 24V DC on terminal connectors
	24V DC Passive Power-over-Ethernet
Power consummation	1.3W
Interface	GSM module with Antenna
	Push-push micro-SIM connector
	10BaseT/100BaseTX
	RS-485
	RS-485/RS-232
	USB2.0
	Analog input/Digital output 16
	Analog input 0-10V
	Analog inputs for current
	Measurement clamps
	1-Wire
	CAN FT
GSM modem Frequencies	GSM module type Quectel EG91-E
	LTE FDD: B1/B3/B7/B8/B20/B28A
	WCDMA: B1/B8
	GSM: B3/B8
Multi-band LTE, UMTS/HSPA+ and GSM/ GPRS/EDGE coverage	LTE FDD: B1/B3/B7/B8/B20/B28A
	WCDMA: B1/B8
	GSM: B3/B8
	42Mbps downlink / 5.76Mbps uplink
Connections	CAN bus Bus Connection
	Terminal 0.8mm2
Power supply	screw, 5 mm2
	serial screw, 3.5 mm2
	I/O screw, 3.5 mm2
	1-wire screw, 3.5 mm2
Operating elements LED	1 - CPU load
	1 - Activity
Enclosure material	polyamide
dimensions	61x90x108 mm (WxHxL)
Usage temperature	0°C ... +45°C
Storage temperature	-15°C ... +55°C
Weight	150g
Relative Humidity	10...95 % without condensation

Door contact	
Current / Voltage / Power:	0.5A / 100V / 10W
Housing color:	white
Housing material:	ABS plastic
Functional distance:	15-20mm, 20-25mm
Contact type:	1 x switch contact
Weight	0.01090 Kg

Digital Temp Sensor	
Operating Supply Voltage	3V to 5,5V
Interface Type	3-Wire
Maximum Operating Temperature	125 °C
Minumum Operating Temerature	-55°C
Weight	35 g

Resistance Heater	
Power :	50 W
Start-up current :	2.5 A
Voltage Supply	120 V/240 V~/=
Volume (dm³)	1,162
Weight (g)	322
Mounting	on rail
IP Protection	IP20
Operating temperature	5°C ... +60°C

Electrical Distribution Box

IoT Master RF	
Enclosure	
IP class	IP 20
Environmental requirements	
Operating temperature from	-40° to +75° C
Relative humidity	< 95%, non-condensing
Communication	
RF	Frequency – 2.4 GHz
	Dynamic mesh topology
	Network size up to 128 nodes
	Network depth up to 32 hops
RS232	Communication with ADAC
	115 200 Bd
Power	
Voltage	100 - 240 VAC
Frequency	50/60 Hz
Peak over voltage	600V
Power consumption	<3W
Power Input	single phase supply (L1)
External circuit breaker	type 2B
Wiring	AWG 26 - 14 (0.14 - 2.5 mm2)
SMA external antenna	1x

Siren	
Operating Voltage	12V / DC, 24V / DC
Max. current consumption	35mA
Signal type	multizone
Number of tones	32
IP protection	IP65
Size. (Ø x h)	52 mm x 43 mm
Color	White
Material	ABS
Type	Askari Flange
Noise (max.)	101dB
Weight	86g
Max. temperature	+ 70 ° C
Min. temperature	-25 ° C

IoT Master PLC	
Enclosure	
IP class	IP 20
Environmental requirements	
Operating temperature from	-40° to +75° C
Communication	
PLC	HD-PLC technology
	Dynamic mesh topology
	Network size up to 128 nodes
	Network depth up to 10 hops
RS232	Communication with ADAC
	115 200 Bd
Power	
Voltage	100 - 240 VAC
Frequency	50/60 Hz
Peak over voltage	600V
Power consumption	<3W
Power Input	Supply from L1, L2, L3 for PLC comm.
External circuit breaker	type 2B
Wiring	AWG 26 - 14 (0.14 - 2.5 m2)

Thermostat	
Precision	0.5 °C (neutral connected)
Switching and control range:	2 °C
Voltage Supply	230 V - 50/60 Hz
NO contact	5 A, 250 V~
NC contact	10 A, 250 V~
Volume (dm³)	0,235
Weight (g)	74
IP Protection	IP20

Light Senzor	
Measuring element:	BPW21
Accuracy :	Typ. 5% of measuring range
Housing:	
LI04:	ABS, colour white similar to RAL9010
LI65:	Polyamide, colour white
Sensor wire L:	1m
Protection:	IP65 according to EN60529
Ambient temp.:	-20...+65°C
Storage temp.:	-20...+65°C / max. 85%rF, no condensate

Battery	
Nominal Voltage	12 volts (6 cells)
Nominal Capacity	
20-hr. (70mA to 10.50 volts)	1.40 AH
10-hr. (130mA to 10.50 volts)	1.30 AH
5-hr. (240mA to 10.20 volts)	1.20 AH
1-hr. (850mA to 9.00 volts)	0.85 AH
Approximate Weight	1.20 lbs. (0.54 kg)
Internal Resistance (approx.)	100.0 milliohms
Max Short-Duration Discharge Current (10 Sec.)	14.0 amperes
Shelf Life (% of nominal capacity at 68°F (20°C)	
1 Month	97%
3 Month	91%
6 Month	83%
Operating Temperature Range	
Charge	5°F (-15°C) to 122°F (50°C)
Discharge	-4°F (-20°C) to 140°F (60°C)
Case	ABS Plastic
Power Sonic Chargers	PSC-12300A-C
	PSC-12300-PC

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Electrometer	
System	3-phase, 3 or 4 wire;
	2-phase 3 wire
Power supply	Self power supply
	-20% +20% of the
	rated measuring input
	voltage, 45 to 65Hz
Output	O1: pulse output
	S1: RS485 Modbus port
	M1: M-bus port
Input specifications	
Accuracy	(@25°C ±5°C, R.H. ≤60%,45 to 65 Hz)
Current	From 0.04Ib to 0.2Ib: ±(0.5%RDG+1DGT)
	From 0.2Ib to Imax: ±(0.5%RDG)
Phase-neutral voltage	In the range Un: ±(0.5% RDG)
Phase-phase voltage	In the range Un: ±(1% RDG)
Frequency Range:	45 to 65Hz.
Active power	From 0.05 In to Imax, within Un range
	PF=1: ±(1% RDG)
	From 0.1 In to Imax, within
	Un range, PF=0.5L or 0.8C: ±(1% RDG)
Power factor	±[0.001+1%(1.000 - "PF RDG")]
Start-up current:	20mA
	Self-consumption is not measured.
Start-up voltage	90VLN
Display and touch key-pad	
Type	Backlit LCD, 3 rows by
	8-digit each, h 7 mm
Read-out	Energy: 8 digit. Variables: 4 digit
Touch key	3 (DOWN, Enter and UP).
Current overloads	
Continuous	65A, @ 50Hz
For 10ms	8450 A
Voltage Overloads	
Continuous	1.2 Un
For 500ms	2 Un

Input impedance	
230VL-N	1.2Mohm
120VL-N	1.2Mohm
5(65) A	< 1.25VA
Temperature drift	≤200ppm/°C
Operating temperature	-20 to +65 °C, indoor,
	(R.H. from 0 to 90% noncondensing @ 40°C)
Connections	
Cable cross-section area	Measuring inputs: max. with/without metallic cable ferrule; Max. screw tightening torque: 2.8 Nm
Other terminals	1.5 mm², Min./Max. screws, tightening torque: 0.4 Nm
Housing	
Dimensions (WxHxD)	54 x 90 x 63 mm
Material	Noryl, self-extinguishing: UL 94 V-0
Sealing covers	Included
Mounting	DIN-rail
Protection degree	
Front	IP51
Screw terminals	IP20
Weight Approx.	240 g (packing included)

Router	
Mobile module	4G (LTE) – Cat 4 up to 150 Mbps, 3G – Up to 42 Mbps, 2G – Up to 236.8 kbps
Status	Signal strength (RSSI), SINR, RSRP, RSRQ, EC/IO, RSCP Bytes sent/received
Wireless mode	IEEE 802.11b/g/n, Access Point (AP), Station (STA)
WiFi users	Up to 50 simultaneous connections
Network protocols	TCP, UDP, IPv4, IPv6, ICMP, NTP, DNS, HTTP, HTTPS, FTP, SMTP, SSL v3, TLS, ARP, VRRP, PPP, PPPoE, UPnP, SSH, DHCP, Telnet,SMNP, MQTT, Wake On Lan (WOL)
Allow Remote Access	Allow access through WAN
Protocol	HTTP(S), MQTT, Azure MQTT
MQTT gateway	Allows sending commands and receiving data from Modbus Master through MQTT broker
Input voltage range	9 – 30 VDC (4 pin industrial socket), reverse polarity protection, surge protection >33 VDC 10us max
Power consumption	< 5 W
Ethernet	2 x RJ45 ports, 10/100 Mbps
SIM	1 x SIM slot (Mini SIM – 2FF), 1.8 V/3 V, external SIM holder
Input	1 x Digital non-isolated input (on 4 pin power connector)
Output	1 x Digital open collector output (30 V, 300 mA, on 4 pin power connector)
Power	4 pin DC connector
Antennas	2 x SMA for LTE, 1 x RP-SMA for WiFi antenna connectors
Casing material	Aluminum housing, plastic panels
Dimensions	74 x 83 x 25 mm (L x W x H)
Weight	125 g
Operating temperature	-40 C to 75 C
Ingress Protection Rating	IP30