

# COMMUNICATION SENSOR

## S10-BT



The communication sensor S10-BT is designed primarily for the creation of the communication channel between the devices equipped with optical interface according to the standard ČSN EN 62056-21 and DLMS/COSEM on one side and software application on the other side. Optical interface according to the standard ČSN EN 62056-21 is provided by various devices from the ZPA Smart Energy portfolio (*electricity meters, ripple control receivers, communication modules, ...*).

The sensor S10-BT transfers optical signals in the infrared spectrum (modulated by serial interface) to the virtual serial port Bluetooth (SPP). It enables wireless communication with galvanic separation. It includes optoelectronic transmitter, receiver, accumulator, Bluetooth module and microprocessor for communication control.

Integrated toroid magnet enables to attach the sensor S10-BT to the surface of the device in a way that enables removal and, at the same time, centre optical interfaces.

The equipment could be delivered with following accessories: a cover of the optical interface, USB cable for charging the accumulator, neck cord with a snap hook, loop for connection of the sensor and cover to the snap hook. As optional accessories can be ordered mains charger (230 V) - must be specified in order. For reliable sticking of the communication sensor to the optical port of the electricity meter the cover of the optical interface connected with the neck cord with a snap hook must be removed from the communication sensor.

The sensor S10-BT is charged through a micro USB connector (5 V=); therefore, it is possible to charge the accumulator from any PC or other standardized equipment with USB connector.

The sensor S10-BT is activated by pressing the push-button. If the sensor is idle for a longer period of time (no communication takes place), it goes to the sleep mode again. Length of the period depends on the level of charging of the accumulator; in case of full charging for approximately 5 minutes.

The sensor S10-BT is equipped with a set of indication LEDs:

- Orange – charging of the accumulator.
  - Lit – charging of the accumulator via USB interface.
  - Fast flashing – zero voltage or disconnected accumulator.
- Green – the device is ON (flashing).
- Blue – signalling of active communication (flashing).
- Red – discharged accumulator and other failure conditions.
  - Flashing – low level of voltage of the accumulator (in case of critically discharged accumulator, the sensor is switched off immediately).
  - Lit – error mode.

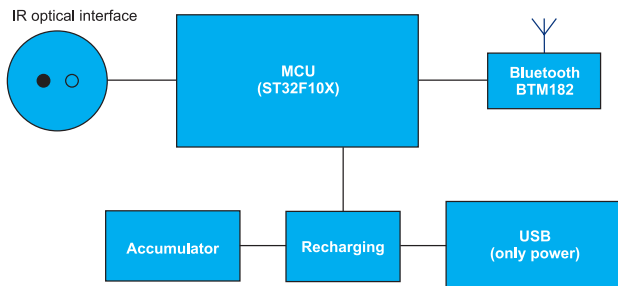
## BLOCK DIAGRAM

### Push Button

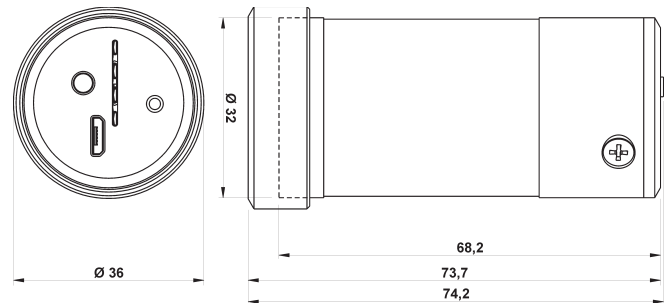
Switches on/off the device, longer pressing can activate special function

### LED

- Signalling of charging of the accumulator
- Device is switched on
- Signalling of active communication
- Signalling of discharged accumulator



## DIMENSIONAL DRAWING



### Technical Data

Maximum communication speed of optical interface:	19.200 Bd
Bluetooth Class	Class 2
Operating / Storage Temperature	-20 to +60 °C
Basic Dimensions	Diameter: 32 mm Height: 68 mm <sup>1</sup>
Ingress Protection	IP30 (not intended for use in aggressive conditions)
Battery	Li-pol (charge time: PC USB 3 hours; mains charger (230 V) 1 hour) Capacity 320 mAh Nominal Battery voltage: 3.7 V Current Consumption of the Device While Charging: Max. 100 mA Current Consumption of the Device While Reading: 20 – 80 mA (depending on the operating mode) Number of readings of one charging cycle of the communication head depends on the quantity of the transferred data and conditions of the accumulator (operating time 8 hours)
Orientation of Built-in Toroid Magnet	North on the side of the equipment being connected.

### Non-specified parameters are identified in the following documents:

EN 62056-21 Electricity metering – Data exchange for meter reading, tariff and load control - Part 21: Direct local data exchange

IEEE 802.15 standard – Specification of WPAN (wireless personal area network)

ETSI EN 300 328 v1.8.1 Electromagnetic compatibility and radio spectrum matters (ERM) – Wideband transmission systems – Data transmission equipment operating in the 2.4 GHz ISM band and using wide band modulation techniques; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

EN 62479:2010 Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)

### Connection to PC or PDA equipment:

- Switch on the sensor and pair it with the required equipment (initial PIN is 1234)
- In the equipment a new serial port appears, through which it is possible to communicate with the head
- Communication speed between the equipment and the head is configurable
- Communication parameters are 8 data bits, no parity, one stop bit (8N1)

<sup>1</sup> This dimension does not comply with the specification EN 62056-21

## CARE AND MAINTENANCE

For possible cleaning of the outside surface from dust and other impurities, the manufacturer does not recommend using organic solvents, aggressive chemicals and abrasive cleaning agents. It is necessary to comply with the required storage temperatures; a failure to comply with them can result in shortening the service-life of the electronic components. Furthermore, the electricity device shall be protected against wet and humid conditions. Precipitations, humidity and liquids including minerals cause corrosion of electric circuits if the device becomes wet. The device may not be placed on and dried by placement on a source of heat or inserted into a source of heat (e.g. microwave oven, classic oven or radiator / heater). The device can be overheated and some of its parts could explode. It may not be exposed to excessive heat; it can result in deformation of covers. The device is not kept in cold premises, especially with the follow-up repeated warming (to the nominal operation temperature). Humidity can condensate in the device and damage electronic components or isolation properties of the device can deteriorate.

### Service

The service shall be ensured by the company: ZPA Smart Energy a.s., Komenského 821, 541 01 Trutnov, Czech Republic, Trademark Smart Energy, Tel. + 420 499 907 111, E-mail zpa@zpa.cz, www.zpa.cz .

### Transport

For the preparation, the device shall be packed either in the original package, in which it was delivered by the manufacturer, or in such package, which cannot cause damage resulting from handling or transport.

## SAFETY

### Manufacturer Warnings

The product is capable of safe operation. The manufacturer has issued the EU Declaration of Conformity as per Act 90/2016 Coll. Despite this fact, the manufacturer warns of the risk of possible danger resulting from incorrect handling or incorrect use of the product as follows:

- Plexiglass damage (scratches, chipping) of the optical interface may result in malfunction.
- The product contains a powerful permanent magnet, which may affect the operation of other devices occurring close to the communication head.
- Installation and maintenance must be performed by a competent person with the applicable electrotechnical qualification that shall acquaint the operator with the conditions of safe operation.
- The product may not be used for other purposes that it is produced for.
- The product may not be wilfully modified contrary to the type design.
- The product can not be repaired neither device components can be replaced without the permission of the manufacturer.
- The product may not be operated with different voltage, current than it was produced or expertly modified for.
- The product must be located and secured so that manipulation by persons without electrotechnical qualification, especially children, is hindered or, as the case may be, disabled.
- During the operation, it is necessary to ensure that in the area where the product is installed there is no danger of fire or explosion in case of creation of gases, vapours of flammable liquids and occurrence of flammable dust.
- The product may not be operated in the conditions and environment, which do not guarantee safe operation (e.g. location on flammable base, cover from flammable material, imperfect Ingress Protection against penetration of foreign particles or, as the case may be, against water or other liquids).
- The product may not be operated in the premises with bigger oscillation and vibrations that it is specified in this Service and technical manual.

Failure of the user to observe any of the aforesaid warnings renders the manufacturer not being liable for a defect occurring as an incidental consequence of this failure. Non-observance of storage and operation conditions recommended in article Care And Maintenance can have an adverse effect on the device service life.

### Responsibility

The owner of the device is responsible for ensuring that all persons engaged in working and handling the product:

- Are knowledgeable and qualified as per national regulations;
- Have read and understood corresponding parts of this document;
- Strictly observe safety regulations and operation data stipulated in its individual articles.

The owner of the device is further responsible for:

- Protection of persons;
- Prevention of damage to material;
- Personnel training.

### Safety Instructions

The following safety instructions shall be observed under all circumstances:

- Local safety regulations shall be observed. The device installation shall be executed solely by qualified and trained personnel;
- During installation, the product shall be firmly held or secured against falling and causing injury;
- Dropped device shall not be installed even if showing no visible signs of damage. It shall be returned for inspection either to designated repair office or directly to manufacturer. Internal damage can cause functional failures or a short circuit;
- The product shall by no means be cleaned under running water or by high-pressure equipment. Water penetration can cause a short circuit. It is necessary to respect ingress protection of the device.

## DISPOSAL

As per certificate ISO 14001 data, the components used in the device are mostly separable and so can be disposed of or recycled accordingly. At the end of its service life, the device shall be handed over to specialized companies dealing in used material separation and consequent recycling. An unused device shall be disposed of ecologically as per the Waste Act.

The device contains no radioactive, carcinogenic or other materials having an adverse effect either on human health or the environment. All plastic materials can be recycled.

Packing is recyclable and at the end of its service life shall be handed over to specialized companies as a source of secondary raw materials or energy.

### Liquidation and Legal Regulations Concerning the Environment Protection

The product disposal shall strictly observe local regulations for environment protection.

Components	Disposal
Printed circuit boards, LED	Electronic waste. Dispose of as per local regulations.
Battery	Dangerous waste. Dispose of as per local regulations.
Metal parts	Separate and hand over to the waste collection centre for disposal as per local regulations.
Plastic components	Separate and hand over for disposal or re-granulation as per local regulations.