ROSSMA™

NEASURING AND SWITCHING DEVICE

ROSSMA IIOT-AMS PULSE

OPERATION MANUAL

The ROSSMA IIOT-AMS PULSE switching device is designed to count pulses coming from control and measuring devices (liquid, gas, pulse meters, industrial flow meters), to measure the output frequency of industrial mass meters, as well as to monitor the condition of equipment connected to one or more discrete inputs of the ROSSMA IIOT-AMS switching device. Provides offline operation and wireless data transfer in LoRaWAN or NBiOT network.

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LINE NAME	DEVICE NAME
ROSSMA IIOT-AMS PULSE	ROSSMA IIOT-AMS PULSE ROSSMA IIOT-AMS PULSE Ex

HISTORY OF DOCUMENT EDITION

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INTRODUCTION

This manual applies to ROSSMA IIOT-AMS PULSE measuring and switching device (hereinafter switching device) and defines installation and connection procedure, as well as control commands and functional description.

The manual is intended for specialists familiar with the installation rules in the field of various electronic and electrical equipment.

To ensure proper functioning, the switching device must be installed and adjusted by qualified personnel

1. 1. DESCRIPTION AND OPERATION PRINCIPLE

SWITCHING DEVICE DESCRIPTION

ROSSMA IIOT-AMS PULSE switching device is designed for independent pulse counting (including frequency more than 300 Hz) coming from instrumentation and transmission of received data in LoRaWAN® or NBiOT network.

The switching device can be used in industrial enterprises, infrastructure of housing and communal facilities, in hard-to-reach places (wells, basements). The switching device provides the possibility to install control and measuring devices in places with no power supply, operates in difficult climatic and weather conditions.

ROSSMA IIOT-AMS PULSE switching device provides instrument functionality from the built-in power supply, allowing to install sensors with the switching device in hard-to-reach locations where no power supply is available..

The switching device is manufactured with a 3.6 V power supply. The power cell of the ROSSMA IIOT-AMS PULSE switching device is a built-in battery with a capacity of 1200/6000/9000/14000/19000 mAh, designed for up to 10 years service life when counting readings and transmitting data once a day.

WARNING: The switching device is equipped with a built-in power cell - a non-rechargeable lithium-thionyl chloride (LiSOCL2) battery. **Attempts to charge the battery can cause fire!**

DATA COLLECTION AND TRANSMISSION ALGORITHM

Counting and summing of pulses is performed from monitoring and metering instrument continuously. The package with the counted data is transmitted in the wireless network with a period of 1 minute (it is not recommended to set the frequency less than 1 minute to ensure long autonomous operation). Read data are stored in the switching device memory.

The data transmission period can be configured from 1 minute. By default, the manufacturer sets the data transmission frequency to 1 time/hour. The data is transmitted on the specified timer, which is installed in the internal memory of the switching device..

The switching device is powered by a built-in 3.6V power supply. The capacity of the 9A/h power supply is calculated for the service life according to the table (for example):

	Data read frequency			
	1 time/min.	1 time/2 min.	1time/10 min.	1time/hour
When connecting active CMD				
Autonomous operation time of ROSSMA IIOT-AMS Pulse	55 days	110 days	1,5 days	9 days

If the Request Confirmation parameter is disabled, the switching device sends the current data to the network with the specified frequency. There is no package delivery check in this mode. Untransferred packages do not remain in the switching device memory.

The communication time of the switching device is controlled by the LoRaWAN network server and can be adjusted by command.

FUNCTIONALITY

The switching device is designed for operation with the following control and measuring devices:

- Operation with liquid, gas, steam meters
- Pulse output of electric meter
- Operation with flowmeters and mass meters

The switching device is class A device (LoRaWAN classification) and provides the following functionality:

- ADR (Adaptive Data Rate) support
- Wireless configurable LoRaWAN activation type in LoRaWAN network - OTAA, ABP. By default: ABP
- Configurable communication period from 1 minute and more (configured remotely over LoRaWAN network). The default value is 1 times per hour
- Support for sending confirmation packages (configurable)
- Two operating modes "Active" and "Warehouse";
- Temperature measurement
- Measurement of built in battery charge in %.
- количество входов до 8

MARKING

The switching device marking is made in the form of application on the housing, which contains information on the product name.

There is a label with the device number for its identification from the manufacturer in the housing. This number also serves as ID with the ratings of a particular switching device.

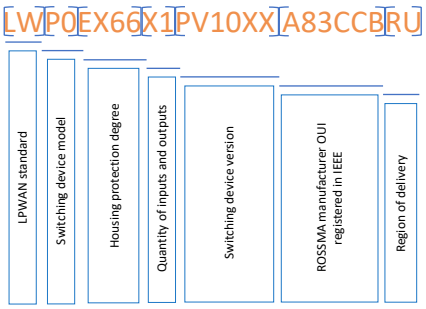
The switching device certificate contains the following information:

- Product name;
- Product version information;
- Keys required to log in the switching device in the network;
- DevEUI;
- Month and year of production.

The label with the device number is located in three places - on the switching device housing, on the electronic board inside the housing and on the packing box (the first digits before the separator: the device number - XXXXXXXXXX).

It is possible to identify the device certificate by the device number in the column "identifier" - the last digits in the number after the separator.

The ID is XXXXXXXXXXXXXXXXXXXXXXXXXX - XXXXXX. The first part of the identifier is the part number and the second part is the serial number of the switching device. Interpretation of part number:



LPWAN standard: LW – LoRaWAN, NB – NbiOT, 6LP-6LoWPAN, LWNB - both standards.
Switching device model ROSSMA IIOT-AMS: AN-Analog, MB-Modbus, MU-Modbus Utility, Pulse-P0, DC-Dry Contact, LD-Leak Detector, SD-Smoke Detector, AB-Alarm Button, CN-Can, UC-Universal Controller.
Degree of enclosure protection: IP56-0056, EX IP66-EX66, EX IP68- EX68,etc.
Number of inputs: X1-single channel, X4-four inputs, etc.
Switching device version: specifies the hardware platform and firmware version.
Manufacturer OUI: Unique identifier of ROSSMA in IEEE.
Region of delivery: RU-Russian Federation, EU-European Union.

DATA ON CERTIFICATION

Manufactured according to УАБИ.001.83301259.2017 ТУ specification.

Certificate of compliance No. РОСС RU.0001.21АВ90

Declaration ЕАЭС N RU Д-RU.АБ93.В.08697 on Compliance with the Technical Regulation Requirements of the Customs Union TP TC 020/2011 "Electromagnetic Compatibility of Technical Means" meets industrial safety requirements. Certificate of conformity NoC-RU.МТЭ.ОС.001.Н.0003

The housing complies with the Technical Regulation Requirements of the Customs Union TP TC 012/2011 "On Equipment Safety for Operation in Explosive Environments"

2. 2. TECHNICAL CHARACTERISTICS

THE MAIN

Multichannel	Up to 8 – upon request (by default 1)
connection interface	Pulse (frequency) input
Operation temperature range	-55…+85°C
Built-in temperature sensor	Yes (sends data every time you connect)
Built-in power supply charge measuring	Yes (sends data every time you connect)

LoRaWAN

Class of LoRaWAN device	**A**
Frequency plan	RU868, EU868, IN865, AS923, AU915, KR920, US915, KZ865, any (on the basis of EU868)
Activation method in LoRaWAN network	ABP или OTAA (adjustable)
Communication Period	Adjustable in LoRaWAN network
LoRa antenna type	internal
Sensitivity	-138 dBm
Radio communication range in dense development	Up to 5 km
Radio communication range in non-urban area	Up to 15 km
Default transmitter power	25 milliwatt (adjustable)

POWER SUPPLY

Built-in battery capacity	specified when ordering (9000 mAh by default)
External power supply capability	yes
Power supply of connected instrumentation from switching device	no

КОРПУС

Housing dimensions	Depends on battery capacity (3 sizes) 82 * 80 * 55, 64 * 58 * 35, 80 * 75 * 55
Housing protection degree	Versions: IP 56 or IP 66+Ex 1ExeIICT4 Gb, IP66
Mounting	The housing has holes for stationary fastening to any surface. The housing can be completed with a plate with for DIN rail adapter(it is specified when ordering).

3. WORKING WITH THE SWITCHING DEVICE

CONTACTS DESCRIPTION

Fig.1 ROSSMA IIOT-AMS PULSE

ACT indicator– data reading
Lora indicator – data transfer

INITIAL START-UP

Before using the switching device, you must connect the battery plug to the terminal on the board.

The switching device supports two methods of activation in the LoRaWAN network - ABP and OTAA. By default, the manufacturer sets the activation method to ABP. You can specify one way by using a special command sent to the switching device in LoRaWAN network.

4. 4. COMMUNICATIONS PROTOCOL

DATA PACKAGE FORMAT

Data package format for ROSSMA IIOT-AMS PULSE switching device:

cc00000022000000000000000220ddc12 - 16 byte

Cc - package type
0x00000022 - counter value between data transfer
0x000000000000000022 - counter value from device reset
0x0ddc - voltage
0x12 – temperature

SWITCHING DEVICE CONFIGURATION AND PROGRAMMING

The switching device receives the following control commands on port 1 or port 2:

0x01001E, where 0x001E is the new call-out interval in seconds (not saved when power is reset)

0x02001E, where 0x001E - time in seconds when the switching device communicates next time

0xBB - Query of the switching device version. The answer with version numbers, for example 0xBB010402000301 where will be at once sent to this command where:

0xBB - Package type

0x0104 - Switching device type

0x0200 - Software version

0x0301 - Device version

The switching device is supplied with built-in firmware that enables the switching device to operate with the characteristics specified in this document. The switching device is programmed using a special input for the programmer.

The switching device is configured using special control commands that are sent to the switching device in LoRaWAN network.

5. 5. STORAGE AND TRANSPORTATION RULES

ROSSMA IIOT-AMS switching devices shall be stored in the factory package in heated rooms at temperature from 5 ° C to 40 ° C and with relative humidity not more than 85%.

The switching devices can be transported in covered cargo compartments of all types for any distances at temperature from -40 ° C to 85 ° C.

6. 6. DELIVERY SET

The standard delivery set of ROSSMA IIOT-AMS Pulse switching device includes:

- ROSSMA IIOT-AMS switching device in factory packaging упаковке – 1 pc.
- Certificate - 1 pc..

7. WARRANTY

The warranty period for the switching device is 12 months after the start of operation or 18 months from the date of delivery, whichever of these periods expires earlier (the "Warranty Period").

The Manufacturer will correct (by repair or supply of replacement parts) any defect which will appear in the Goods and which will be reported to the Manufacturer within the Warranty Period.

The manufacturer is obliged to provide repair services or replace the failed switching device within the entire warranty period.

The consumer is obliged to observe the conditions and rules of transportation, storage and operation specified in this user manual.

The Manufacturer shall not be liable for defects caused by normal wear, non-compliance with the Manufacturer 's requirements in terms of storage, installation, operation or operating conditions; inadequate usage; any changes or repairs not previously authorized by the Manufacturer in writing.

Warranty is not subject to:

- Switching device power cells that have sent more than 80,000 packages

- switching devices with the mechanical, electric and/or other damages and defects which arose at violation of transportations, storage and operation condition;

- Switching devices with repair traces outside the manufacturer 's service center;

- Switching devices with traces of oxidation or other signs of liquids ingress into the device housing.

If a warranty case occurs, contact the service center of the ROSSMA manufacturer at:

614064, Perm, Chkalova Str., 9 Lit. "И".

Phone: 7 (342) 233-93-99.

Or fill out the form on the support page: https://rossma.ru/support/

www.rossma.ru

Operation manual LLC ROSSMA , 2019.