

FOUNDED

in **2007**

[Grant received]

CORE OF THE DEVELOPMENT

Small-sized atomic clock (SAC) is a source of high stability frequency and precise time for radio electronic engineering.

KEY INNOVATIONS

Atomic clock emits a signal which frequency is determined by quantum states of atoms. It guarantees high and long-term stability.

In addition, SAC has low power consumption and small size. It will allow using them, unlike the existing analogues, not only in bulky or fixed equipment but also in the modern portable and energy effective devices.

IMPLEMENTATION OF THE DEVELOPMENT

ALREADY IN **2014**

PEOPLE

HEAD OF LABORATORY:

Vladimir L. Velichansky, PhD in Physics and Mathematics

GENERAL DIRECTOR:

Alexander N. Kuznetsov, PhD in Engineering

Applications of the development

1

In communication systems with packet switching:

- satellite communication on the basis of low-orbit and geostationary spacecraft;
- base stations of cellular and other types of wireless communication;
- access points and switches 4G+.

2

In on-board devices of the spacecraft:

- small-sized satellite systems.

3

In consumer navigation devices:

- reduction of the time of synchronisation with the satellite clock by ~ 10 times, improvement of positioning in the city;
- inertial navigation (without satellite signals).

4

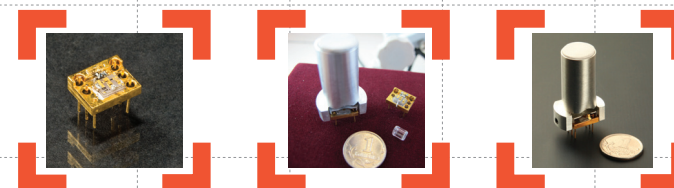
In systems of control synchronization for complicated distributed and remote objects:

- smart power networks;
- sensor networks;
- smart homes.

5

In aircraft control systems:

- control, communication and navigation of UAV (unmanned aerial vehicles);
- avionics;
- bistatic radiolocation.



Product features

1

SAC operating principle is based on the effect of coherent imprisonment of populations in rubidium (or caesium) atoms, which allows reducing size of the device tenfold as compared to exiting compact atomic standards.

2

Having, furthermore, lower power consumption, better long-term stability and fast reach of the operating mode, SAC will replace precision quantum generators and will find broad application in portable devices.

3

The Russian development will use the best optical diagram of the reference resonance generation in rubidium atoms. Due to this fact it is planned that domestic SAC will in several times surpass its closest competitors by stability of output frequency.