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Одеський національний політехнічний університет
Odessa National Polytechnic University



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з питань науково-промислового співробітництва

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RESISTANCE-TO-VOLTAGE CONVERTER BASED ON RL-DIODE GENERATOR OF CHAOTIC OSCILLATIONS

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Resistance-to-voltage converter based on RL-diode generator of chaotic oscillations can be used for measurements (in the appliances for measuring non-electric physical quantities with the use resistive transducers).

The increasing complexity of technological processes leads to the need to identify a large number of parameters and physical quantities, the role of measurements increases, too. Automation of complex production processes is associated with a variety of transducers that ensure operational measurement data in the proper amount and effective process control. The most common are parametric resistive converters.

A lot of them provide the necessary practical for metrological characteristics (such as distinguishing ability) to convert quite small changes of output impedance, such as strain gauge measurements. This, in turn, leads to the amplification of random noise to the signal which increases the random error of measurement. Therefore, increasing the sensitivity of resistive transducers while ensuring low-level random noise is an important task [1, p. 129].

The use of the properties of chaotic systems in measurements is the field researched not enough. Using a generator of chaotic oscillations as a measuring transducer for measured information can significantly increase the sensitivity of measurements as in chaotic nonlinear systems the strongest process dependence on the parameters is in random fluctuations [1, p. 129].

Resistance-to-voltage converter using RL-diode generator of chaotic oscillations is shown in Fig. 1.



Fig. 1. Resistance-to-voltage converter using RL-diode generator of chaotic oscillations

Block diagram of the resistance-to-voltage converter using RL-diode generator of chaotic oscillations is shown in Fig. 2 [2].

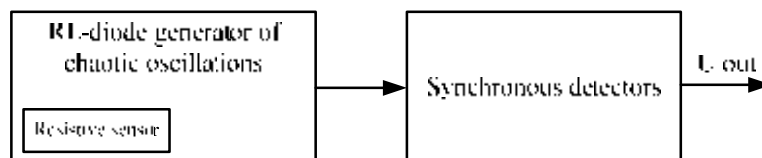


Fig. 2. Block diagram of resistance-to-voltage converter using RL-diode generator of chaotic oscillations

Measuring transducer which is based on chaotic oscillations is on oscillatory system with complex dynamics. Various oscillating modes that such system demonstrates require detailed consideration to select the optimum operation of the measuring transducer.

The scheme involves only two linear elements (resistance R and inductance L) and a nonlinear element (diode D). When choosing the values of the circuit elements of the converter based on RL-diode generator of chaotic oscillations one must take into consideration not only the possibility of getting into the zone of chaos but also the proximity to other oscillating modes [1, p. 130].



To realize the transformation of resistance in a constant voltage on the output of the generator of chaotic oscillations the synchronous detector is connected. As the primary measuring transducer the variable used is resistor R1.

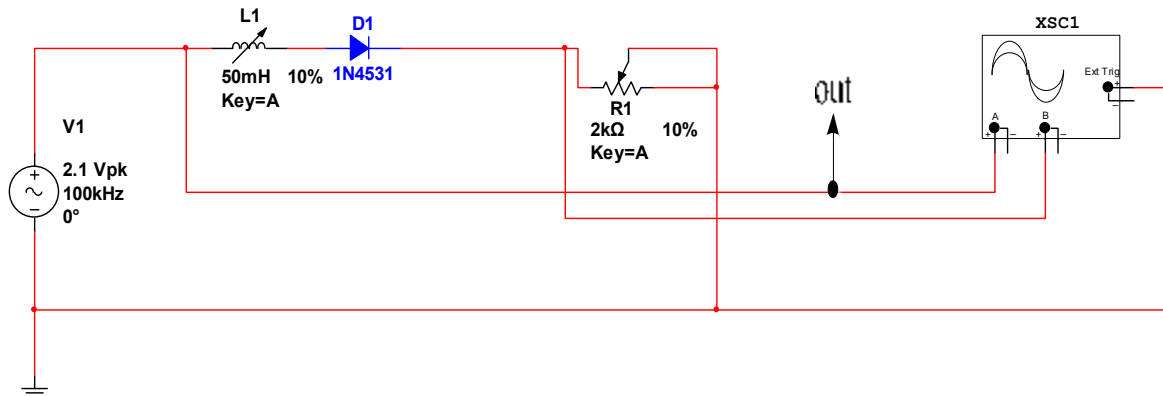


Fig. 3. Measuring circuit RL-diode generator of chaotic oscillations

Method of measurement

The method is designed to measure various physical quantities with high accuracy are usually higher speed measuring procedures in compared with traditional methods.

Its principle is used as a measuring range of nonlinear electrical circuits using random fluctuations, namely the generator of chaotic oscillations. The sensor of measuring a physical quantity (or value of the direct signal) is connected to the circuit generator of chaotic oscillations in such a way that its output value changes the value of one generator parameter of chaotic oscillations.

Measured information in the method of the generator of chaotic oscillations is a discrete realization of the random process which is removed from the generator of chaotic oscillations and then given in the computer unit to study.

For the parameter estimation of chaotic oscillations generator one can use any stable characteristic structure of “strange attractor” (the amplitude of the oscillations in all variables of the phase space, Hausdorff dimension, information dimension and correlation, Kolmahorova entropy, Lyapunov exponent, the average time predictability of chaotic systems). The algorithm of diagnosing parameter in the method of generator of the chaotic oscillations is obtained by chaotic shot of numerical evaluation of selected characteristics.

Measuring aid created on the method of chaotic oscillations generator will have the conversion function in a strong (exponential) characteristic dependence of attractor the chaotic oscillations generator on the measured physical quantity (since it is uniquely determined by the diagnostic parameter of the generator random fluctuations).

The main advantage of the method of random oscillations generator is the ability to build more sensitive and accurate measurement tools than existing ones on its base. Mistake of the method depends on the accuracy of the numerical evaluation of the characteristics of the chaotic oscillations generator which is determined by required length and pitch of a discrete random process. The mistake of the method is less than the mistake due to instability of parameters that can actually provide up to date development electronics is was as shown by theoretical and experimental studies, using the chaotic process of longer than 10 periods of lower harmonic of chaotic oscillations generator.

The advantage of the method is its versatility. The method is suitable for measuring any of physical quantity if there is a sensor of the values with output signal in the form of voltage or current, as well as parametric sensors in measuring physical quantity which is converted to the corresponding resistance, capacitance or inductance change.

Experimental studies show that due to the dynamic characteristics of chaotic oscillations generator the method is not behind a widely used method of bridge circuits.

References

1. Кучерук, В.Ю. Перетворювач опору в напругу з використанням R1-діодного генератора хаотичних коливань / Кучерук В.Ю., Севастьянов В.М., Маньковська В.С. // Електротехнічні та комп'ютерні системи. — 2012. № 6(82). — С. 129 — 133.

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