Temperature and humidity sensor data acquisition

1. Introduction

Each electronic device has operating parameters specified by the manufacturer, which the user must ensure for its proper functioning. One of these parameters is the temperature and humidity of the environment. Electronics usually emit large amounts of heat to the environment, so it is necessary to use cooling systems inside the electronics cabinets. To increase the efficiency of cooling systems, so-called closed-loop systems are used. The closed-loop system is a control system where the signal flow occurs in two directions. A signal that implements the interaction of elements runs from the input to the output. Following, a feedback signal runs from the output to the input. In the case of a rack cooling system with electronics, the feedback signal is the temperature inside the rack.

2. Description

During the implementation of the topic, the student will learn about the SIMATIC S7 1200 or S7 1500 PLC controllers and the TIA Portal environment. The student will learn the difference between analog and digital signals. The student will also learn about the Modbus RTU protocol and the RS-485 interface. The student will also gain practical skills in using tools to prepare cables and acquire knowledge of converting data types. The student's task will be to read out the temperature and humidity values from the memory of the digital temperature transducer using a PLC and visualize the obtained values on the HMI panel. The task includes making the necessary electrical connections.

Figure 1. Temperature and humidity transducer

3. Prerequisites

- Basic electronics knowledge.

4. Recommended number of participants

1 participant

5. Supervisors

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