1-Wire. Connection and operation of thermometers and temperature and humidity sensors

User Manual
1-Wire. Connection and operation of thermometers and temperature and humidity sensors
(version 6 dated from August 7, 2018)

Contents

Necessary Tools, Devices, Materials ................................................................. 3
General information .......................................................................................... 4
Connection of THS via 1-Wire protocol ............................................................ 6
Setting of Monitoring Software ....................................................................... 9
Necessary Tools, Devices, Materials

To connect digital thermometers DS1820 (DS18S20, DS18B20) (hereinafter - thermometer) and temperature and humidity sensors DS1923 (hereinafter - THS) to the Galil tracking device (hereinafter - tracking device) one should have:

1. Electrical tools.
2. Set of connecting wires.
3. Windows-based computer with the installed program of configuration of Galileosky tracking devices – "Configurator". It is recommended to install the latest version of the program from the site https://galileosky.com/padderzhka/programmyi.html
1-Wire. Connection and operation of thermometers and temperature and humidity sensors
(version 6 dated from August 7, 2018)

General Information

DS1923 sensor (Pic. 1) is a detector of temperature/humidity which is designed for temperature and humidity measurement and storing of the measured values in the protected sector of memory. THS connects to the process controller via 1-Wire interface; at this physical connection requires two conductors: the line of data and the general.

THS can store the values of the temperature/humidity, measured with an interval of from 1 second to 273 hours in memory. Working measuring ranges: temperature from -20°C to +85°C, humidity 0% to 100%. Temperature measurement accuracy is not worse than ±0,5°C in the range from -10°C to +65°C when using software correction. The steel case of the detector has high resistance to harmful effects of environment.

Duration of the sensor operability heavily depends on operation temperature and registration frequency (Pic. 2), for example, at the temperature of 20°C and registration of indications once per 3 minutes the sensor service life is about 3 years, and at the temperature of 60°C and registration of indications is once per 30 seconds then the service life is about 200 days.

Pic. 1
Temperature and humidity sensor DS1923
1-Wire. Connection and operation of thermometers and temperature and humidity sensors
(version 6 dated from August 7, 2018)

**DS1820 (DS18S20, DS18B20)** – a digital thermometer (Pic.3) with programmable resolution from 9 to 12-bits that can be stored in the EEPROM of the device’s memory. The thermometer communicates via 1-Wire bus and may be the only device on the line, as well as work in a group. All processes in the bus are managed by the Central microprocessor. Range of measurements is from –55°C to +125°C and with an accuracy of 0,5°C in the range from –10°C to +85°C. In addition, the thermometer can be powered from the voltage of the line of data («parasite power»), in the absence of the external voltage supply.

Release of DS1820 thermometers is already stopped, instead of them it is possible to use full analog - DS18S20 thermometers. Thermometer DS18B20 differs from the DS18S20 in the fact that the duration of measurement of temperature in 9-bit representation is 10 times less than at DS18S20; in addition, the DS18B20 – is the sensor which is giving out temperature at 12-bit representation in increments of 0.0625°N.

**ATTENTION!** The tracking device rounds received values of temperature to the whole units. The period of poll of thermometers and THS makes 60 seconds.
Connection of THS via 1-Wire protocol

Connection of THS via 1-Wire protocol should be carried out in accordance with the scheme of Picture 4. It is possible to connect 8 thermometers and 8 THS to one 1-Wire input.

**ATTENTION!** The scheme shows the connection of thermometers using the «parasite power» when functioning is provided due to power received via data bus and due to the supply of energy in the built-in condenser. In case of use of a large number of sensors or long connecting cables, we recommend using the external power supply which is applied to VDD input.

To check the connection of thermometers and THS to 1-Wire input of the tracking device go to the “Device” tab of the Configurator and check the displaying of registered values (Pic. 5).
1-Wire. Connection and operation of thermometers and temperature and humidity sensors
(version 6 dated from August 7, 2018)

Go to the “Settings” tab -> “Protocol” of the Configurator; configure the main packet to send
1-Wire input data to the server (Pic. 6 and 7)

Pic. 5
Displaying of registered values

Pic. 6
Configuring of main packet in the Configurator for thermometer data transmission
ATTENTION! There is no any binding of a particular thermometer or THS to a certain tag in the protocol. All data get to the memory cells in a certain order - from lower tag to higher one. If the number of cells more than the number of sensors of the same type, the excess higher cells will contain data which correspond to interrupted state of the sensor.
Setting of Monitoring Software

After setting of the digital input of the tracking device, you should configure the monitoring software:

1. Temperature and humidity values are transmitted by the tracking device to the monitoring server (Pic. 8).

2. Custom graphical reports on temperature and humidity are generated on the basis of the received data (Pic. 9, 10).

![Displaying of readings in monitoring server software](Pic. 8)

![The description of sensors in the monitoring server program](Pic. 9)

![Example of the graphical report](Pic. 10)
1-Wire. Connection and operation of thermometers and temperature and humidity sensors
(version 6 dated from August 7, 2018)

Connection of thermometers and temperature and humidity sensors to the Galileosky tracking device via 1-Wire protocol is completed; the tracking device is ready to operate.

RSA “Galileosky”, LLC produces satellite monitoring equipment for GPS and GLONASS real time vehicles monitoring. The tracking devices determine the mobile object location recording the time and route as points with geographical coordinates and send the data to the server to be further processed and sent to the traffic controller panel.

In addition, a number of other vehicle parameters are recorded: the state of analog and discrete inputs of the tracking device and the state of digital interfaces.

The tracking devices can be used in any vehicle.