

# OPERATION MANUAL



## Temperature probe DS18S20 with connection cable and RJ11 plug

### Description



### Characteristic features

- Ready made, plug-in type temperature probe with DALLAS semi-conductor sensor DS18S20
- Sensor in stainless steel protective sleeve
- Splash waterproof
- Connection black PVC flat cable
- RJ11 plug connector with breakage protection
- Continuous operating temperature  $-10...+60\text{ }^{\circ}\text{C}$ , stationery  $-40...+80\text{ }^{\circ}\text{C}$ , short time  $100\text{ }^{\circ}\text{C}$  (see Temperature range on page 2)
- Resolution  $0.06\text{ }^{\circ}\text{C}$
- Accuracy  $\pm 0.5\text{ }^{\circ}\text{C}$  nominal (from  $-10...+85\text{ }^{\circ}\text{C}$ ), as per data sheet of manufacturer
- Scratchpad memory for probe identification

### Areas of application

- Monitoring of frozen goods as per cold storage regulations
- Building instrumentation
- Air conditioning systems
- Quality assurance
- Science and research laboratories
- Industrial temperature logging

### Available probes

The reasonably priced probes with PVC connection cable are meant for measurement in open atmosphere, on surfaces or in non-aggressive gas medium. The probes are sealed and can bear water contact for some time. However, long term immersion in liquid is not recommended.

### Temperature range

The Dallas temperature sensors are semiconductor sensors. The un-housed sensors are suitable for temperature measurement in the range of  $-55...+125\text{ }^{\circ}\text{C}$ . These temperature values are the final limits and operating above these values is not at all recommended, otherwise the component can get damaged. In addition, the allowable application temperature also depends on the connection cable and type of protection sleeve used. PVC insulated cable gets hard and brittle below  $-10\text{ }^{\circ}\text{C}$  and hence should not be used at these lower temperatures otherwise the insulation may crack. Above  $60\text{ }^{\circ}\text{C}$  continuous operating temperature, the PVC becomes soft and can get deformed. At approx.  $80\text{ }^{\circ}\text{C}$ , the material becomes plastic and the insulation gets damaged under pressure.

### Technical data

Measuring range	$-55...+125\text{ }^{\circ}\text{C}$
Operating range	$-10...+60\text{ }^{\circ}\text{C}$ , more detailed information on page 2
Accuracy	$\pm 0.5\text{ }^{\circ}\text{C}$ at $-10...+85\text{ }^{\circ}\text{C}$
Nominal length	40 mm
Diameter probe	$\varnothing 6\text{ mm}$
Material probe	Stainless steel 1.4571
Model	with decoupling capacitor
Connection cable	PVC-flat cable, unshielded
Plug connector	RJ11, 6P4C
CE-conformance	2004/108/EG
EMV-noise emission	EN 61000-6-3:2011
EMV-noise withstanding	EN 61000-6-1:2007
Article	Art. No
Temperature probe DS 1820	
connection cable 2 m	DS1820-LC-2M
connection cable 5 m	DS1820-LC-5M
connection cable 10 m	DS1820-LC-10M
connection cable 15 m	DS1820-LC-15M
connection cable 20 m	DS1820-LC-20M
connection cable 30 m	DS1820-LC-30M

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### Installing and configuration

The Dallas temperature sensor of type 1820 has an internal identification (serial number) and can be operated in parallel together with several other components on a three-wire bus. After wiring all the sensors, the PC adapter must be individually configured for the connected sensors. Operation is not possible without prior configuration of the system. Since the configuration is stored in the internal EEPROM of adapter, this process is to be done only once. Only if an additional sensor is to be used on the existing network, the configuration needs to be repeated.

The sorting of probes, found on the network, is done on the basis of binary serial number.

### Pin configuration of RJ11-plug connector

The Western-plug connector is configured as follows (View on the cable, i.e. contact surfaces of the plug!):

- 1 Unoccupied
- 2 Ground
- 3 Dallas Data or unoccupied
- 4 Dallas Data
- 5 +5 V
- 6 Unoccupied



In 4-core flat cable, PIN 1 and PIN 6 are not occupied. PIN 3 and 4 are bridged together at the PC-adapter. Only PIN4 is needed to connect the data line of the sensor.

### Measuring accuracy

The sensors are calibrated during manufacture and have a typical measuring accuracy of  $\pm 0.5$  °C at 23 °C application temperature. At the upper and lower limit of measuring range, the accuracy is somewhat on the lower side. Further information is available in the data sheet of component at the website of manufacturer.

During all temperature measurements, the physical conditions are also to be taken care of in order to avoid measuring error, which mainly decides the precision of measuring arrangement.

### Thermal transition resistance of measuring objectsensor

This is the main measuring error which occurs during surface measurements. This can be eliminated by providing good thermal contact through mounting in a tube, applying thermal conducting paste or thermal conducting adhesive.

### Thermal heat transfer of sensor-ambient temperature

During surface measurements, the measuring arrangement should be thermally insulated from the surroundings, for example, with some foam material or mineral wood.

### Thermal heat transfer of sensor-connecting wires

This measuring error can be minimised by itself, for example, if the connecting lead used is as thin as possible and the connecting material is a bad thermal conductor or if the connecting wire is tempered with the measuring object.

In principle the highest measuring accuracy is achieved through immersion in liquids or in a mounting tube. However, an additional measuring error should be included while taking measurements on surfaces.

### Accessories

Accessories	Articleno.
Distribution box for temperature measuring system, 10 sockets RJ12	VERT-GEH
Temperature measuring system TLOG with RS232-Interface	0567 0002
Temperature measuring system TLOG with USB-Interface	0567 0004
Humidity/temperature measuring system with USB-interface Hytelog Multisensor USB	0567 0001

### Attention

Please avoid extreme mechanical and inappropriate exposure.

The device/product is not suitable for potential explosive areas and medical-technical applications.