**Description**

**Characteristic features**
- Up to 20 temperature measurement points
- Measuring range: –55...+125 ºC
- Use of temperature probe DALLAS-Sensors type 18B20, 18S20
- Three wire, parallel connection of sensors
- More than 60 meter lead length
- 0.06 ºC resolution
- Automatic configuration
- Inclusive simple Windows™ software

**Areas of application**
- Monitoring of cold storage or stock rooms, in food industry
- Quality assurance
- Temperature measurement in buildings, air conditioning, heating control, solar plants
- Dallas connection adapter for customer specific software on Windows or Linux platform

**Windows Software**
- Display of current temperature values
- Tabular representation of measured values
- Storing of data on hard disk
- Graphics Software as accessories

**Operation**

The product offers an efficient measurement and indication system for a maximum of 20 temperature channels. DALLAS sensors of type 1820, 18B20 are used as temperature sensors and these are connected in parallel with a three wire lead. By using suitable cables, it is possible to achieve larger lead lengths up to a few hundred meters.

The integrating member between PC and sensor network is a micro controller module which is inserted at the serial COM-Port and makes the DALLAS-Touch-Bus ready through a six pole RJ12 plug connector. Suitable connection cable or measurement sensor can be easily made or can be readily procured from us.

The micro controller controls the dallas touch bus, manages the serial numbers and picks up the temperatures of all connected sensors in a cyclic manner. The currently measured values are sent as ASCII string to the connected PC. The display and graphical representation of measured values (option) appears on the PC. An easy to use Windows software for display of measured values and data representation is included in the scope of supply.

More such modules can be operated with a PC, provided more free COM-ports are available at our disposal. If the program RECORDER is used, only one module per PC can be read.

**Technical Data**

**Temperature measurement**

- **Number of channels**: configurable, 1 to 20
- **Measurement range**: -55...125 ºC
- **Typical accuracy** for sensor DS18B20: ±0.5 ºC (-10...+55 ºC)
  ±2 ºC (-55...-10 ºC, +85...+125 ºC)
  (see curve on page 2)
- **for sensor DS18S20**: ±0.5 ºC (0...+70 ºC)

**Module**

- **Dimensions module**: L785 x W40 x D21 mm
- **Operating temperature**: –10...+55 ºC
- **Operating voltage DC**: 9 V-24 V DC (mains plug)
- **Operating current**: approx. 40 mA
- **Interface**: 4800 Baud, 8 Data bits, No parity, One Stop bit
- **CE-Conformance**: 2014/30/EU
- **EMV-noise emission**: EN 61000-6-3:2011
- **EMV-noise withstanding**: EN 61000-6-2:2007

**Accessories** See ordering numbers on page 5

**Article number**

<table>
<thead>
<tr>
<th>Article Number</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>0567 0002</td>
<td>RS232</td>
</tr>
<tr>
<td>0567 0003</td>
<td>RS485</td>
</tr>
<tr>
<td>0567 0004</td>
<td>USB 1.1, 2.0 and 3.0 compatible</td>
</tr>
</tbody>
</table>
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WINDOWS-Software RECORDER

With the help of this program the measured values can be received through the interfaces and recorded on the PC. The recorded data is compatible with any desired spread sheet program, with which it is possible to further process the measured values for statistical evaluation and interpretation.

Installation: The program should be first installed under Windows 98, Windows NT, Windows 2000, Windows XP, Windows Vista or Windows 7 system. Place the attached CD in your drive and run the program “setup.exe” either by selecting “Run” from the START menu or through the windows explorer. Then follow the instructions of the installation program. The setup program creates a new program group “HYGROSENS INSTRUMENTS” in the folder “programs”. After successful installation, the software can be accessed and executed through the START menu.

First time operation: Connect the temperature logger to a free serial port on the PC. If the software runs for the first time in the menu option “settings”, select device type as “20Ch. Thermometer Templog 4800 Bd” and also the serial interface used (for example, COM1) under “interface”. The remaining settings (Data rate, Parity, Start and Stop bit) are automatically selected and need not be changed. In case the connection hangs, refer to data communication in the terminal window. Then select “OK” the current settings will be stored.

Please note that still micro controller adapter has to be configured as per the connected sensors, before displaying the measurement values.

Data communication: The maximum allowable distance (between PC and interface converters) depends on the model of the interface adapter.

USB-Interface: For USB-Interface the max. allowable length is restricted: As per standard, only 5 m are allowed. Due to high frequently signals, this value should not be exceeded with the use of passive connection cables. Only special USB cables may be used. For further routes, special repeater-cables are available, which extend the allowable radius by 15 m in each case. Max. 5 such repeaters can be cascaded. (No extend of delivery)

Connection of Sensors

The Dallas temperature sensors of type 1820 has an internal coding (serial-number) and can be operated along with several other sensors on a three wire bus. The sensors are calibrated by the manufacturer. For short connection lengths, there are no special requirements in respect of the connecting cable to be used. It is also recommended to connect a ceramic capacitor of 100 nF from pin +5 V to pin GND at each sensor.

The lead length with unshielded cables can go up to 60 m. To increase the approach length, an additional Pullup-resistor of 1.5k to 10 k-Ω (from Pin “DALLAS” to pin +5 V) can be added. With this, it is possible to increase the cable length up to 150 m or more, but with slightly lower accuracy of measurement due to the increased temperature rise of the sensors.

If you are not able to make any data communication between PC and the measuring device or the measuring adapter, then first please check the power supply and also cable connection to the PC.
OPERATION MANUAL

Temperature measurement system TLOG20 connections RS232, RS485, USB

Plug connector layout
Power supply: The articles 0567 0022 and 0567 0003 get their power supply via socket-plug. The inner core of the 3.5 mm socket-plug carries positive operating voltage of approximately 9 to 24 V DC. The outer conductor is minus. 

The power supply for article 0567 0004 is given via USB-port.

Sensor-plug connector: The Western plug connector 6P6 (RJ12) on the logger side is as shown below (view of the cable i.e. the contact surfaces of the plug):

<table>
<thead>
<tr>
<th>PIN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
</tr>
<tr>
<td>3</td>
<td>Data</td>
</tr>
<tr>
<td>4</td>
<td>Data</td>
</tr>
<tr>
<td>5</td>
<td>+5V</td>
</tr>
<tr>
<td>6</td>
<td>+5V</td>
</tr>
</tbody>
</table>

Automatic sensor search
The system should be configured once before first time operation. For this, all sensors are connected and operating voltage is applied.

- After pressing the ‘Configuration’ key on the board shortly for three times (in each case, approximately pressing for 1.5 seconds and then pausing for one second), the program goes into Auto search mode. The LED consecutively blinks three times in a cyclic manner for short duration.
- If now the ‘Configuration’ key is operated for at least 5 seconds, the sensors connected on the bus are searched and the new configuration is stored in the controller’s memory. The process can as often be repeated as desired. After the sensors are searched and identified, the current temperature values appear on the screen.
- To exit from the Auto search mode, the operating voltage must be switched off for a short while. The configuration remains stored.
- During execution of Autosearch-Function, the stored calibration values are also deleted (see below).

Format of Data transfer
The interface works at a data rate of 4800 Bd, 8 databits, no parity and one stop bit. The transfer of useful data takes place in lines. All characters are ASCII coded. All information is sent continuously without separation characters. In a line, only information of one channel is transferred. At the end of the line, the last two ASCII characters are sent for the check sum (8 bit CRC) of the current line. Each line closes with the character ‘Carriage return’ ‘<CR>’. Several lines form a data-block. A data-block can have the following contents, for example:

```
@<CR>
I011010E0223C00000B1<CR>
V0106DATDC<CR>
I02101050013C00000021<CR>
V0206C276<CR>
I031010B0093C00000017<CR>
V0306CCF8<CR>
$<CR>
```

The data block has following structure:
- A synchronization pattern for the beginning of a Data block. For synchronization, the sequence '@<CR>' is used.
- The configuration data (‘Identifier’) of a channel. The data line begins with the character ‘I’, followed by the logical channel number, and then followed by configuration data and the Sensor serial number. The line is closed with the check sum and the character '<CR>'.
- The measurements of a channel. The data line begins with the character ‘V’, followed by the logical channel number, followed by useful data. Only numerical measurement values and the check sum (CRC), at the end of the line, are transferred. All other information like number format, number of characters, physical unit, etc. are contained in the configuration data (sensor coding).
- The configuration data and measurement values follow the same scheme for all other channels.
- The continuation character `$<CR>` is sent at the end of a data-block

Structure of Config Dataline
The configuration data line contains all information of the sensor working on the corresponding channel. The line has following structure:
- Character ‘I’ at the beginning of the line.
- 8 bits (two ASCII characters) physical sensor coding. Based on sensor coding, the number format, scale, physical unit and allowable range
- of values are specified. The sensor coding is 01 for the described device.
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• 8 bits (two ASCII characters) Hardware coding (type of the measurement sensor). The Dallas sensors have the code number 10 for 1820 and 28 (HEX) for 18B20.
• 48 bits (twelve ASCII characters) serial number of the sensor: Here, the serial number of Dallas-sensor is mentioned.
• 8 bits (two ASCII characters) CRC (check sum)
• ‘<CR>’ as line termination

Structure of Measured value Datalines
The measurement value data line contains the current measurements of the sensor operating on the corresponding channel. All information are represented in binary and is transferred ASCII coded format without separation characters. For the sensor marking 01, the line has following structure:
• Character ‘V’ at the beginning of the line
• 8 bits (two ASCII character) logical channel number
• 2 Bytes (4 ASCII characters) measurement data with 0.01°C resolution. The hexadecimal value is to be converted into a decimal number and to be divided by 100. With this, the temperature value is obtained in °C with two decimals.
• 8 bits (two ASCII characters) check sum (CRC)
• ‘<CR>’ as line termination

Accessories (Optional)
Software “PCLOG”

The software screen are in English and German language. Temperature values can displayed in °F or °C. Besides data storing on hard disk, the software offers as most important feature the graphical representation of all measured and recorded channels in the form of a temperature Vs time chart (online scriber function). By means of Drag & Click, the window section can be enlarged and the time or temperature axis can be scaled as desired. Besides the graphic view, the representation is also possible in the form of a table. Cut & paste is used for capturing measured data series into a spreadsheet program (for example EXCELTM). All tables and graphic representations can be printed out in colors. In addition, simple monitoring and controlling functions are also integrated in the software. Limits can be set for each channel. An acoustic signal (Wave file) is given when the values are exceeded. Control of up to eight external devices is possible by a relay card, to be attached at the parallel port or USB connector.

Software Profilab

With this software, professional measurement and control projects can be realized in a simple, graphics based development platform. You can simply draw the wiring diagram of the measurement circuit and do the project design. Without any knowledge of programming, the measurement values of up to 16 temperature sensors can be easily used in the measurement circuit. Arithmetic and logical components take care of linking and processing of the measurements. Modules like impulse generators, timers and relay cards etc. provide extensive possibilities for control and regulation. Various instruments, scribers and tables serve as the storage and representation of measured values and you can monitor the measurement system with display and control elements. The system is operated through a self designed front panel, on which you can arrange switches, potentiometers, displays, LED’s, instruments etc. The software also enables compilation of the project into an EXE-file, which can run without Profilab.
OPERATION MANUAL

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Ordering numbers

<table>
<thead>
<tr>
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</tr>
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<tbody>
<tr>
<td>PC-measurement with RS232 interface</td>
<td>0567 0002</td>
</tr>
<tr>
<td>PC-measurement with RS485 interface</td>
<td>0567 0003</td>
</tr>
<tr>
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<td>0567 0004</td>
</tr>
</tbody>
</table>

Accessories

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Switching AC/DC adaptor, 12 V, 670 mA (not needed for 0567 0004)</td>
<td>NG-12V-670MA</td>
</tr>
<tr>
<td>Screw type temperature probe M10, cable 2 m</td>
<td>DS1820-HD-2M-M10</td>
</tr>
<tr>
<td>Temperature probe DS18S20 with PUR cable and RJ12 plug, 2 m</td>
<td>DS1820-PUR-2M</td>
</tr>
<tr>
<td>Temperature probe DS18S20 with PUR cable and RJ12 plug, 5 m</td>
<td>DS1820-PUR-5M</td>
</tr>
<tr>
<td>Temperature probe DS18S20 with PVC-cable and RJ11-plug, 2 m</td>
<td>DS1820-LC-2M</td>
</tr>
<tr>
<td>Temperature probe DS18S20 with PVC-cable and RJ11-plug, 5 m</td>
<td>DS1820-LC-5M</td>
</tr>
<tr>
<td>Distribution box 10- port with housing</td>
<td>VERT-GEH</td>
</tr>
<tr>
<td>Software Profilab expert</td>
<td>PROFILAB</td>
</tr>
</tbody>
</table>

Attention

Please avoid extreme mechanical and inappropriate exposure.
The device/product is not suitable for potential explosive areas and medical-technical applications.

For further information, please visit our homepage:
www.bb-sensors.com