

# Manual



Model

57616

Release

2.30, Sep 2014

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Microsoft, MS-DOS, Windows, Winsock und Visual Basic sind eingetragene Warenzeichen der Microsoft Corporation

Subject to errors and changes:

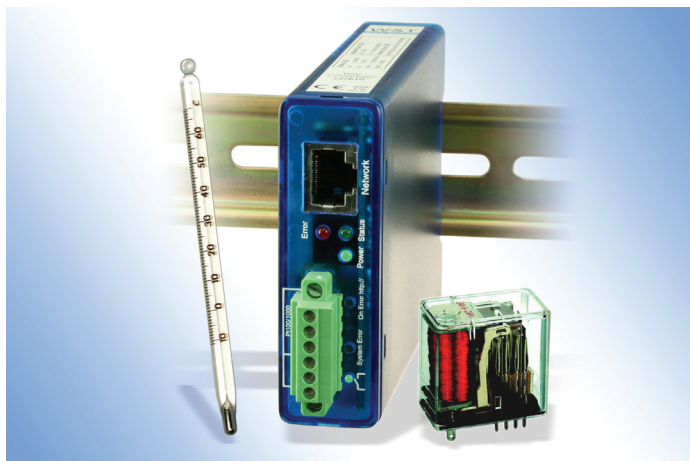
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Perform work on or with W&T products only as described here and after you have read and understood the manual fully. Unauthorized actions may result in hazardous situations. We are not liable for the consequences of unauthorized actions. If in doubt please contact us or your dealer first!

## Introduction

The W&T Web-Thermograph includes all the functions in a single box for capturing, storing and displaying your temperature data. Numerous alarm functions are also provided which can be incorporated into your specific applications or into existing systems. In addition, a relay can be switched in alarm situations.

This manual contains all the information you need for installing, configuring and operating the Web-Thermograph.



## ...other options

Further information and continuously updated application examples can be found on our Web site at:

*<http://www.wut.de/57616/applications>*

You may find the following application possibilities interesting:

- \* Publishing Web-IOs in the Internet via DSL
- \* Retrieving and displaying multiple measurements via PHP
- \* Wireless temperature sensor connection
- \* Switching digital outputs when limits are exceeded
- \* Sending alarm messages via e-mail/SMS
- \* Incorporating temperature values via OPC server
- \* Displaying measurements in Nagios

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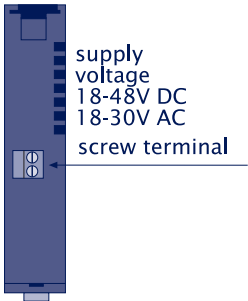
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1 Quick startup / Commissioning

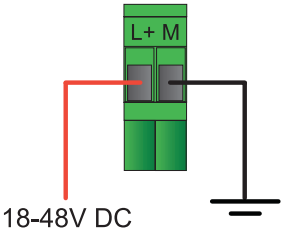
Just a few steps are required to start up the W&T Web-Thermograph and make it visible in your network.

1.1.1 Connect the supply voltage

Bottom 57616

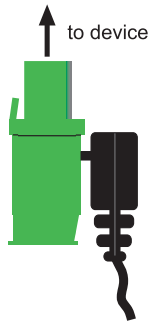


If you want to use a power supply, connect 18-48V DC or 18-30V AC AC to the corresponding screw terminal. Polarity is non-critical when connecting AC power supplies. When connecting DC power supplies please note the polarity as indicated on the screw terminal adapter:





To use the #11020 W&T power supply, screw the power supply plug on to the screw terminal adapter:



### 1.1.2 PoE power supply

The Web-Thermograph Relay is suitable for use in PoE (Power-over-Ethernet) environments in accordance with IEEE 802.3af. The supply voltage is provided here by the network infrastructure through the RJ45 connection. The device supports both phantom power on data pairs 1/2 and 3/6 as well as power on the unused wire pairs 4/5 and 7/8.

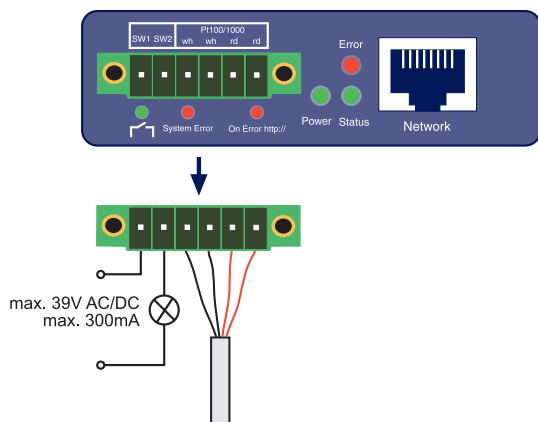
To enable power management for the supplying components, the Web-Thermograph Relay identifies itself as a device of Power Class 1 with a power consumption of 0.44 to 3.84W.

As an alternative to PoE, the Web-Thermograph Relay can also be powered externally at the screw terminal located on the underneath of the housing.



*Use of the Web-Thermograph Relay is also possible in networks with no PoE supply. In this case simply use an external power supply on the screw terminals as described above. No other configuration or settings are necessary.*

## 1.2 Connecting the PT100/PT1000 sensor and output configuration

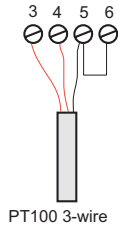


The output of the Web-Thermograph Relay is switched internally using a relay contact (normally open). The consumer is connected to the screw terminals 1 and 2. The maximum switchable DC or AC voltage is 39V, with a maximum current flow of 300mA.

The PT100 or PT1000 temperature sensor is connected to screw terminals 3, 4, 5 and 6, whereby the wires of the same color must lie adjacent to each other.

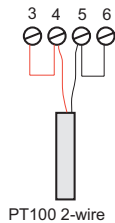
The incoming line to the PT100 4-wire sensor may be of virtually any practical length.

Connecting a PT100 3-wire sensor:



When connecting a PT100 3-wire sensor the same-color wires are connected to the terminals marked with the corresponding colors. A jumper to the remaining free terminal is required for the single wire.

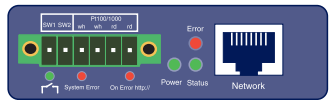
Connecting a PT100 2-wire sensor:



When connecting a PT100 2-wire sensor, one wire is brought to the red terminal and the other to the black terminal. Jumpers must be placed here to the free terminals.

### 1.3 Network connection

The Web-Thermograph Relay has an IEEE 802.3 compatible network terminal on a shielded RJ45 connector. The configuration corresponds to an MDI interface, so that the connection to the hub or switch is accomplished with a 1:1 shielded patch cable.



#### Power-over-Ethernet

The Web-Thermograph Relay can obtain its supply voltage over the network interface as per IEEE 802.3/f/Power-over-Ethernet. The supply may also be provided on the data pairs or the wire pairs which are unused for 10/100BaseT (see *PoE supply voltage*).

## 1.4 Assigning the IP address using „WuTility“

Once the hardware has been connected to the supply voltage as described above, operation in a TCP/IP network requires that the necessary IP address be assigned. You can obtain the correct value for this parameter from your systems administrator.



*The IP address must be unique in the network.*

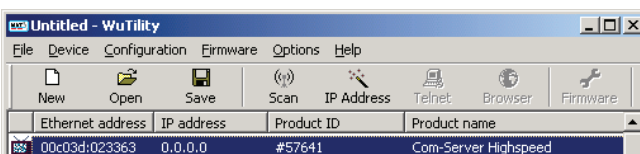
Several alternatives are available for assigning the IP address. To make assignment as convenient as possible, we have developed the „WuTility“ tool, which you can download from the WuT homepage <http://www.wut.de>. This procedure is described in the following. A summary of the alternatives is found in the appendix to this manual.

Be sure that you are connected to the corresponding PC you are using to assign the IP address, that you are in the same subnet as the device, and that both the PC and the device are connected to the network.

When you start, *WuTility* automatically scans the local network for connected W&T network devices and generates an inventory list. This search process can be repeated as often as desired by clicking on the *Scan* button:



Now select your Web-Thermograph from the displayed list:



Click on the „IP address“ symbol:



In the window that now appears enter the desired network parameters for the device and then click on „Continue.“:

A screenshot of the "New Device: Set Network Parameters" window. It contains fields for IP address (172.16.232.29), Address range (Subnet #0), Subnet mask (255.255.255.0), and Default gateway (172.16.232.252). There is a "Caution" section with a warning icon and text about unique IP addresses. At the bottom are buttons for "< Back", "Next >", and "Cancel".

In the following window you can enable the DHCP client for the Web-Thermograph.


A screenshot of the "New Device: Advanced Features" window. It shows the "Automatic address assignment" section with radio buttons for "ipnone" (selected), "BootP", and "DHCP". There is explanatory text about automatic address assignment and a note about turning off the option if not needed. At the bottom are buttons for "< Zurück", "Weiter >", and "Abbrechen".

Clicking on the *Continue* button assigns the network parameters to the Web-Thermograph. All the columns in the device list in WuTility are filled with information. After clicking on the globe in the WuTility menu bar your standard browser is opened and you see the start page of the device.

### 1.5 IP assignment using DHCP protocol

Many networks use DHCP (Dynamic Host Configuration Protocol) for centralized and dynamic assignment of the network parameters, or its predecessor BOOTP as described in the following section. The factory default setting is DHCP enabled, so that in network environments with dynamic IP assignment you only need to connect the Web-Thermograph to the network. The following parameters can be assigned using DHCP:

- IP address
- Subnet mask
- Gateway address
- DNS server
- Lease time

 *To prevent undesired address assignments or address changes, we recommend deactivating DHCP, BOOTP and RARP if they are not expressly used in the respective network environment. Web-Thermographs with incorrectly assigned IP addresses can be conveniently identified and reconfigured after the fact using the scan function of the WuTility management tool.*

#### 1.5.1 Enabling/disabling DHCP

The factory default setting is for DHCP protocol enabled. To disable or reenable it at a later time, the following options are provided.

- **Management tool WuTility**

In the device list highlight the desired Web-Thermograph and click on the *IP address* button. In the first dialog box you enter the new network parameters for assignment and then click on *Continue*.

In the following dialog box disable the options *BOOTP* and *DHCP*. Click on *Continue* to send the new configuration data to the Web-Thermograph.

- **Web Based Management**

In the menu path *Config* → *Device* → *Basic Settings* → *Network* you can alternately enable or disable both protocols. Detailed information about this can be found in the section *Assigning basic network parameters*.

### 1.5.2 System name

To support a possible automated updating of the DNS system by the DHCP server, the Web-Thermograph identifies itself within the DHCP protocol with its system name. The factory setting for this name is WEBIO followed by the last three digits of the Ethernet address. For example the factory set system name of a Web-Thermograph with Ethernet address 00:c0:3d:01:02:03 is *WEBIO-010203*. The system name of the Web-Thermograph can be changed using Web-Based Management.



### 1.5.3 Lease time

The lease time determined and transmitted by the DHCP server specifies the duration time of the assigned IP address. After half the lease time has expired the Web-Thermograph attempts to extend and update the address with the assigning DHCP server. If this is not possible by when the lease time expires, for example because the DHCP server can no longer be reached, the Web-Thermograph deletes the IP address and starts a cyclical search for alternate DHCP servers for assigning a new IP address.

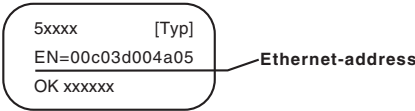
If DHCP is enabled, the remaining lease time together with the current IP address is displayed in seconds in the menu path *Home* → *Doc* → *Property*.



*If the DHCP server is no longer accessible after the assigned lease time has expired, the Web-Thermograph deletes its IP addresses. This disconnects all existing TCP/UDP connections between the Web-Thermograph and other network devices. To avoid interruptions of this kind, we recommend configuring the assigned lease time in the DHCP server to infinite if possible.*

### 1.5.4 Reserved IP addresses

The Web-Thermograph provides services which other clients in the network can use if needed. These clients of course require the current IP address of the Web-Thermograph in order to open a connection, so that in such applications it makes sense to reserve a particular IP address for the Web-Thermograph on the DHCP server. This is generally done by linking the IP address to the worldwide unique Ethernet address of the device, which can be found on the sticker on the housing.



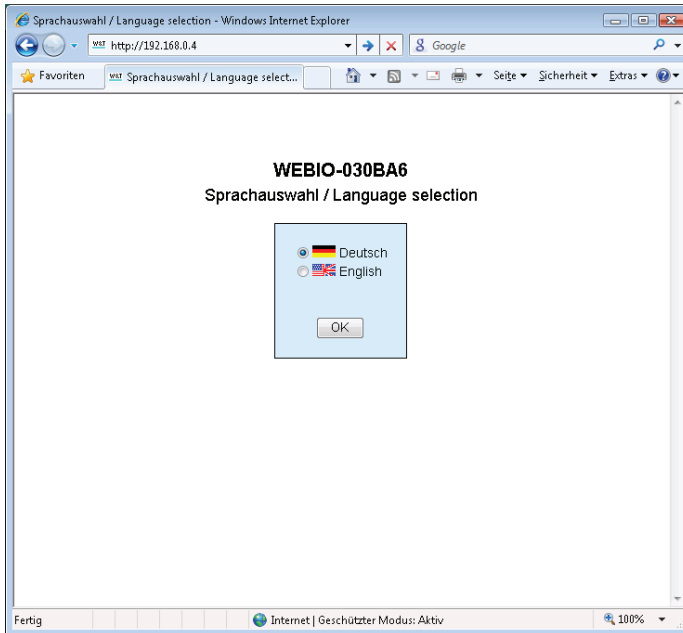
**1.5.5 Dynamic IP addresses**

Fully dynamic address assignment, whereby the Web-Thermograph receives another IP address each time it is restarted or after the lease time has expired, is only practical in network environments with automated cross-connection between the DHCP and DNS services. This means that the Web-Thermograph is assigned a new IP address, the DHCP server then automatically updates the DNS system as well. The new address is associated with the respective domain name. For detailed information about your network environment, contact your system administrator if in doubt.

For time server requests, sending of e-mails or other client applications in which the device itself actually searches for a connection to server services in the network, dynamic changing IP addresses may be used.

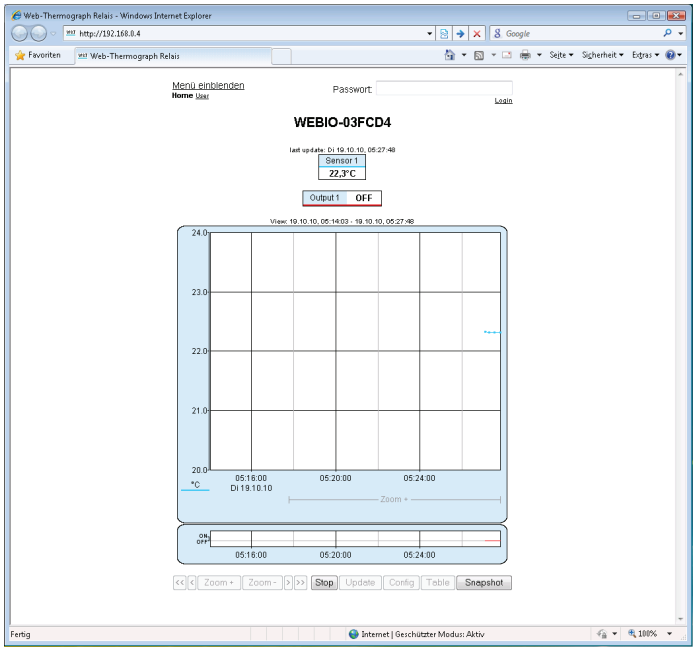
## 1.6 Start page

As soon as an IP address is assigned, the start page of the device can be opened in the Web browser:



The first time the page is opened you must select the device language. Once this is done, you are taken to the actual start page of the device.

To get to the configuration menu, click on „Show menu“ at the top of the page. If you assign a password as part of your configuration, you can log in here already.



In addition, this page allows you also to switch to the User page for directly reading out the device data logger.

Show the menu in order to make further configuration settings.

## 1.7 Assigning basic network parameters

Select the menu item „Config“ at left in the configuration tree.



You are now prompted to enter a password. As shipped the device has not password set, so that you can simply click on the Login button without entering any password.

**Config / Login**

Password :

[Back to Web-Thermograph Homepage](#)

On the next page select the configuration path using the profiles.

Login Rights:  
Config  
Admin

Navigate with the tree on the left side. Avoid the use of the buttons "Next" and "Back" of your browser, this might cancel your changes of configuration data.

The "profiles" provides an easy way to make the required modification step by step.



Select the profile „Basic network parameters“ and click on the „Show profile“ button.

- ☐ No profile (expert mode)

**Basic configuration:**

- ☒ Basic network parameter
  - ☐ Configuration of port and device name
  - ☐ Local clock settings
  - ☐ Automatic clock settings with the network time service
  - ☐ Configuration of the data logger
  - ☐ Configuration of the graphics settings
  - ☐ Calibration

**Direct user control:**

- ☐ HTTP access

**Integration in existing systems:**

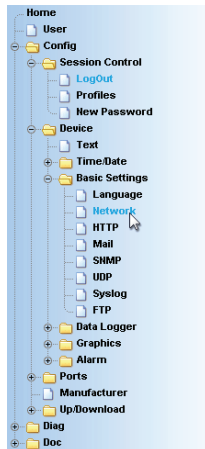
- ☐ Alarm via Output
- ☐ Alarm via E-Mail
- ☐ SNMP incl. alarm via trap
- ☐ Alarm via TCP (client mode)
- ☐ Syslog messages incl. alarm
- ☐ Alarm via FTP (client mode)
- ☐ Clock triggered report

**Access from individual programmes:**

- ☐ ASCII command strings via TCP port 80
- ☐ ASCII command strings via UDP



The device now automatically shows the necessary menu items for this profile. Click therefore in the configuration menu on „Network“.



On the following page enter all the necessary network parameters and then click on the „Logout“ button.

Config >> Device >> Basic Settings >> Network

IP Addr :

Subnet Mask :

Gateway :

BOOTP Client : **BOOTP** requires a IP address reservation within the DHCP server. **DHCP** assigns a IP address from a reserved address range. Direct access is only possible using the 'device name'. **Important: If you are in doubt, check 'STATIC'.**

☒ STATIC  
☐ BOOTP enable  
☐ DHCP enable

DnsServer1 : IP address of DNS server (format xxx.xxx.xxx.xxx)

DnsServer2 : IP address of DNS server (format xxx.xxx.xxx.xxx)

Keep Alive Time : Checking of established connections without any data traffic. Interval in seconds.

Free memory: 48908 bytes

Then clicking on the „Save“ button saves your settings in the device and quits your configuration session. After changing the network parameters the device automatically performs a restart.

#### Config >> Session Control >> LogOut

Save new configuration



Exit without saving



Restore Factory Defaults



The device is now ready to use in your network. For ease of use, use the other profiles for adapting the unit to your re-

## 2 Online measurement storage inside the W&T Cloud

With the cloud service W&T offers a comprehensive solution that enables the backup of data in online storage in addition to the long-term documentation of temperature and humidity measurement data in the internal data logger. The measurement data will be sent directly from the measuring point to the cloud, and is available online.

### 2.1 Auto connect

The cloud functionality is enabled by default on delivery. If the device receives its network parameters via DHCP, or you allow the device Internet access by entering the network parameters, it immediately begins to contact the cloud.

The transmission of the measuring data begins when the device is assigned to a user account.

### 2.2 Create a user account

To transfer the measurement data, first a user account for the cloud access must be created. To do this, go to the cloud homepage

<http://cloud.wut.de>

and click on „create user account“.

After entering your e-mail address and a password you will get access to the cloud.



### 2.3 Assign data by 4-digit access code in the cloud

Log in with your user account to <http://cloud.wut.de> and enter the access code included with the device. The collected data will be transferred to your account and are available for you immediately.

#### **Alternative:**

After you have created a cloud user account, open the configuration menu of your device and login as admin user. Navigate to the page

Config -> Device -> Basic Settings -> Cloud

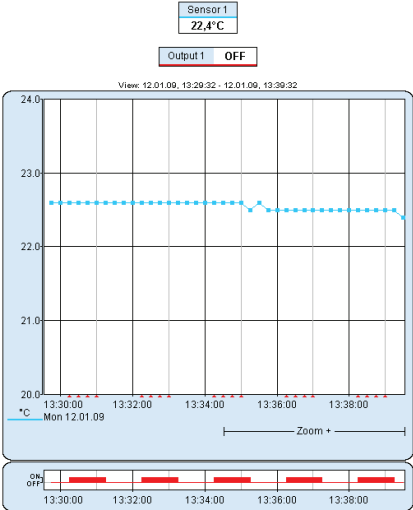
and enter your user data for the cloud access. After clicking on the button „Bind“ all measurement data of this device, from this moment, is stored into your user account.

By clicking on the button „Unbind“ the allocation of the data from this moment is separated and no further values will be stored in your account.

Click again on „Bind“ and a new series of measurements is created in the cloud for your user account.

3 Graphical display of the measured values



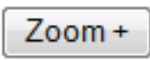
3.1 Basic functions

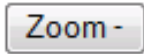


The device provides a table of the current values and a chart of the stored values on the home.htm page.



The navigation buttons at the bottom of the page allow you to do the following.

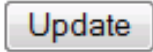
-  Scrolls the chart by the size of the display interval up to one unit to the right or left.
-  Scrolls the chart by one unit of the X-axis to the right or left.
-  Zooms into the area of the chart at the lower right edge marked with „Zoom +“.



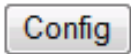
Zooms out to the previous zoom level.



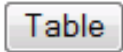
Enables automatic updating of the chart



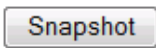
Updates the display.



Opens the configuration menu below the chart



Displays the values currently shown in the chart in table format.



Opens a new page with a snapshot of the graphical display.

Measured value display:



Large marker: This datum is stored in the device data logger.



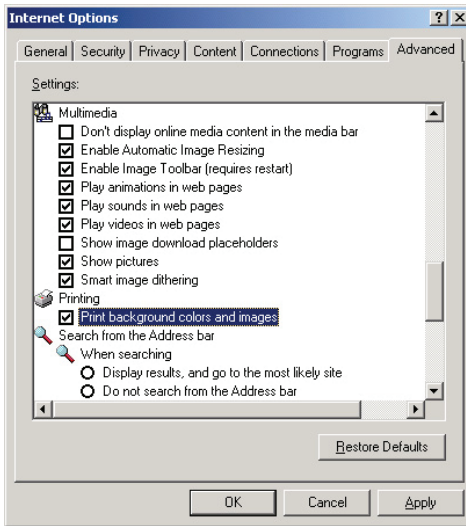
Small marker: This datum is a volatile datum which is used only for display and not stored in the data logger.



*When leaving the zoom level these data are lost. The connecting lines are only displayed in the zoom level which represents the memory.*

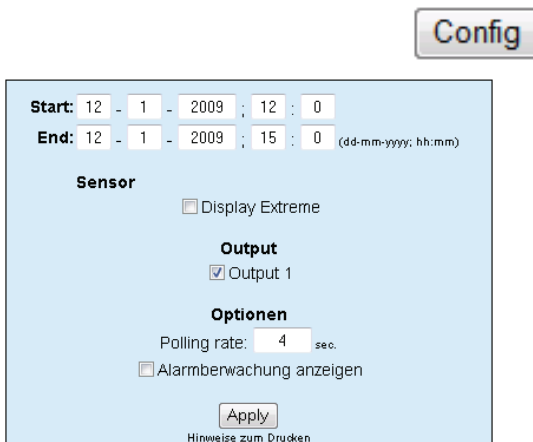
If you want to print out the page containing the graphical output, it is necessary to enable printing of the background colors and images in your Internet options. In Microsoft Internet Explorer this setting is found at

Tools -> Internet options -> Advanced



The layout and positioning of the graphic output can be variably configured. Additional information on this topic can be found in the section *Configuring the graphic output*.

### 3.2 Config menu



The following functions are available from the configuration menu below the graphical representation:

*Start:* Enter here the start time for the X-axis

*End:* Enter here the end time for the X-axis.

*Display Extreme:* If a zoom level is selected in the chart in which a display point shows a measurement interval and not an individual measuring point, this function displays the maximum and minimum measured in this interval. If the zoom level is selected such that every datum is displayed, this function has no effect. If the function is turned off, the average value of the displayed interval is shown.

*Output 1:* Select here whether you want to show the output status in the graphical representation.

*Polling Rate:* Enter here the desired update rate of the graphical representation. The device makes a new value available after no sooner than 4 seconds. Entering a value less than 4 has no effect.

*Show alarm monitoring:* Uses a bar chart to indicate whether alarm monitoring for the respective alarm is active or inactive.

*Apply:* The changes made are immediately applied for the chart.

## 3.3 Table

Table

Report: Mon 01.12.08, 06:33:44 - Mon 01.12.08, 08:33:44

Date, Time	Sensor 1 °C	
Mon 01.12.08, 06:35:55	Max	20.6
	Min	20.6
	Ø	20.6
06:38:06	Max	20.6
	Min	20.6
	Ø	20.6
06:40:17	Max	20.6
	Min	20.6
	Ø	20.6
06:42:28	Max	20.6
	Min	20.6
	Ø	20.6
06:44:39	Max	20.6
	Min	20.6
	Ø	20.6
06:46:49	Max	20.6
	Min	20.6
	Ø	20.6
06:49:00	Max	20.6
	Min	20.6
	Ø	20.6

This function is used to show the currently displayed values in table format. As soon as not all stored values can be displayed, the following sensor values are shown in the table:

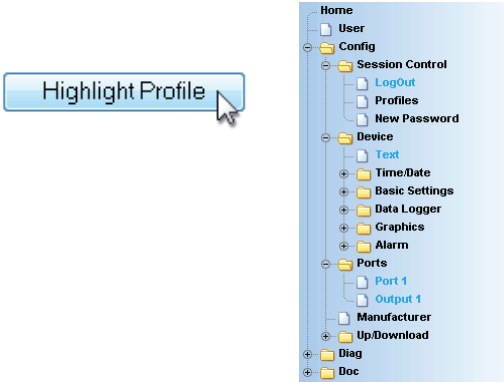
*Max*: The maximum value in the displayed interval

*Min*: The minimum value in the displayed interval

Ø: The average value in the displayed interval

## 4 Additional basic settings

### 4.1 Configuring the port and device name



#### 4.1.1 Text



In the screen shown enter your personal descriptive information and then click on „Save“.

Config >> Device >> Text

**Device Name:** Name of device

**Device Text:** Description  
  
(For a new line use <br>)

**Location:** Location of installation

**Contact:** Contact address

Free memory: 48908 bytes

## 4.1.2 Ports



Enter here a name for the sensor and a descriptive text. Then click on „Logout“ and save your configuration.

Port 1:

**Config >> Ports >> Port 1**

**Name :**

**Text :**   
( For a new line use <br> )

**Select Sensor :** ☒ PT100  
☐ PT1000

**Unit :** ☒ Celcius  
☐ Fahrenheit  
☐ Kelvin

Output 1:

**Config >> Ports >> Output 1**

**Name :**

**Text :**

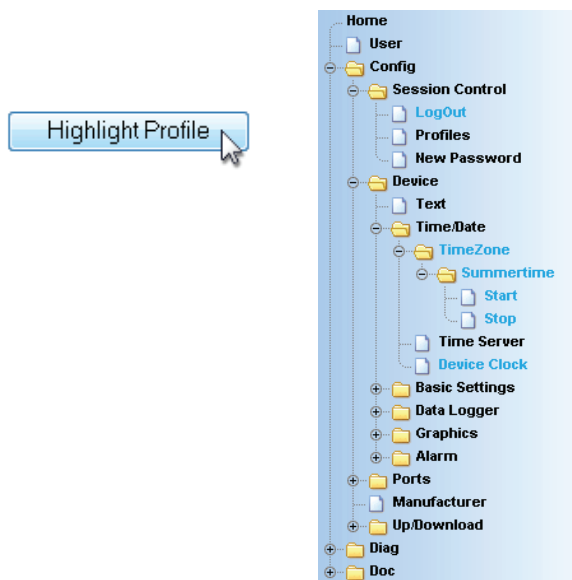
**Polarity :** ☒ normally open contact  
☐ normally closed contact

**Comment :** Further information

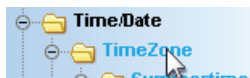
**Enable :** ☒ Manual Reset enable



## 4.2 Local time settings



### 4.2.1 Time zone



Here you define the time zone in which the device is located. The settings refer to UTC (Universal Time Coordinated). Then click on „Temporary Storage“.

**Config >> Device >> Time/Date >> TimeZone**

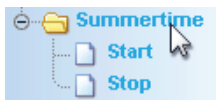
**UTCOffset :** Offset to UTC  
 01 : 00

**Enable :** ☒ Apply Time Zone

Free memory: 48908 bytes

Temporary Storage Undo Logout

## 4.2.2 Summer time



If you want the unit to automatically account for daylight savings time (summer time), first enter the offset to UTC. The standard value (for Germany and relevant countries) is two hours. Enable this function by checking „Apply Summertime“ and save the settings..

**Config >> Device >> Time/Date >> TimeZone >> Summertime**

**UTCOffset :**

Offset to UTC

02 : 00

**Enable :**

☒ Apply Summertime

Free memory: 48908 bytes

Temporary Storage

Undo

Logout

Start/Stop



Define when summertime begins and ends. The parameters are already pre-configured:

Start:

Last Sunday in March at 02:00 a.m.

Stop:

Last Sunday in October at 03:00 a.m.

**Config >> Device >> Time/Date >> TimeZone >> Summertime >> Start**

**Month :** Summer time starts in

**Mode :** on

**Weekday :**

**Time :**  :

Free memory: 48908 bytes

### 4.2.3 Device Clock



If you do not wish to use a time server, you can manually enter the time here. Then click on „Logout“ and save your settings.

**Config >> Device >> Time/Date >> Device Clock**

**Time :**  :

**Day :**

**Month :**

**Year :**

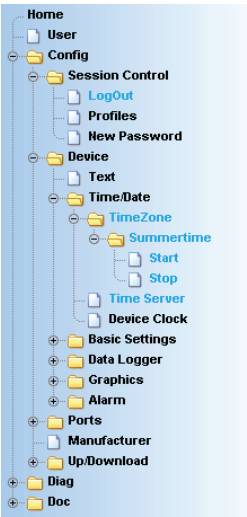
Free memory: 48908 bytes



The unit has an internal, battery-buffered clock so that the time of day remains intact even when the unit is turned off.

4.3 Automatic time settings with the network time service

Highlight Profile



4.3.1 Time Server



If you wish to compensate the time using a time server, enter here the necessary information.

The preset addresses are only an example and do not necessarily have to be used.

Config >> Device >> Time/Date >> Time Server

**UTC Server1 :** Name or IP address of the time server (format xxx.xxx.xxx.xxx).

de.pool.ntp.org

**UTC Server2 :** Name or IP address of the time server (format xxx.xxx.xxx.xxx).

europe.pool.ntp.org

**Sync.Time :** Daily synchronisation time with the time server (hour: 0-23).

12

**Enable :** ☒ Apply TimeServer

Free memory: 48908 bytes

Temporary Storage

Undo

Logout

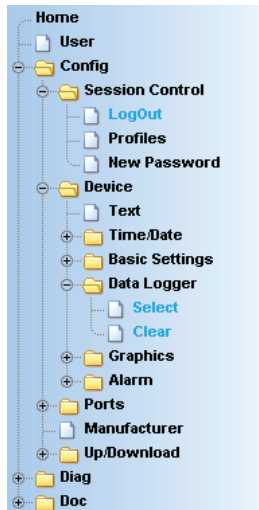


*If you enter a name as the address, be sure that you have preconfigured the gateway and DNS server so that the unit can resolve the addresses.*

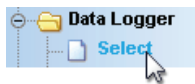
Click on the „Logout“ button and save your settings.

#### 4.4 Configuration of the data logger

Highlight Profile



4.4.1 Select



Make the following settings:

**Timebase:** Defines at what time interval the measurement data are stored in the data logger. The unit will measure a new value in any case every four seconds.

**!** *Note: If Timebase or Select Sensor have been changed, the entire contents of the data logger will be cleared!*

**Select Sensor:** The sensor you select here is used for storing the values in the data logger

Config >> Device >> Data Logger >> Select

**Timebase :** Attention: If you change **Timebase** or **Select Sensor** the memory will be erased completely.  
15 sec ▾

**Select Sensor :** ☒ Sensor 1  
☒ Output 1

**Memory size :** 150 days, 17 hrs., 15 min.

Free memory: 48908 bytes



## 4.4.2 Clear



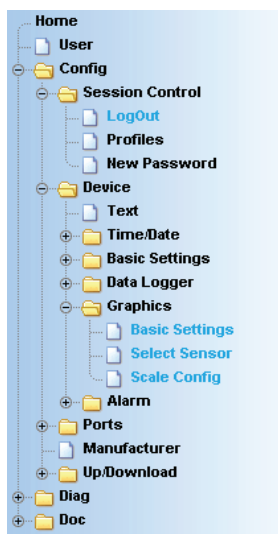
Clicking on the „Clear memory“ button clears the entire contents of the data logger.

**Config >> Device >> Data Logger >> Clear**

Erase all flash data.



## 4.5 Configuration of the graphics settings



### 4.5.1 Basic Settings



## Config >> Device >> Graphics >> Basic Settings

**Enable :**

- ☒ Auto scroll enable
- ☒ Show table
- ☒ Show graph
- ☒ Show control buttons
- ☐ Show config menu
- ☒ Show alarm monitor

**Width :**

**Height :**

**Frame Color :**  

**Background Color :**  

**Polling Rate :** Active only with **auto scroll**.

Free memory: 48908 bytes



Enable:

*Auto scroll enable:* After opening the graphical representation, the measurement values are automatically updated. The navigation buttons are not available when using the Auto Scroll function.

*Show table:* Displays the current values also in table format.

*Show graph:* Activates graphical display of the measurement values.



*Show control buttons:* Displays the control buttons.

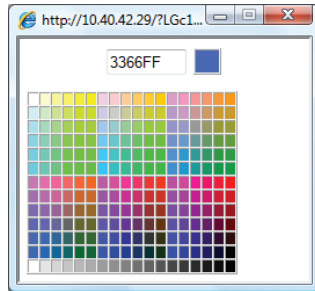
*Show config menu:* Displays the configuration menu for graph representation below the control buttons.

*Show alarm monitor:* Uses a bar graph to show whether alarm monitoring is active or inactive for the respective alarm.

**Width:** Enter here the desired width of the graph display.

**Height:** Enter here the desired height of the graph display.

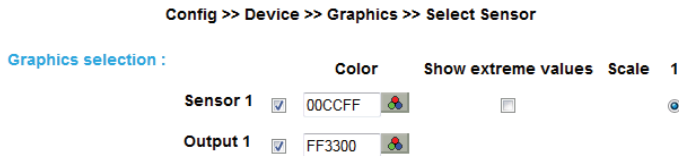
**Frame Color:** Enter here the desired color for the border of the graph display, or select a color using the adjacent color selector:



**Background Color:** Select here the background color of the graph display. The unit makes a new value available no sooner than after 4 seconds. Entering a value less than 4 has no effect.

**Polling Rate:** Geben Sie hier die gewünschte Aktualisierungsrate der grafischen Darstellung ein. Das Gerät stellt frühestens nach 4 Sekunden einen neuen Wert zur Verfügung. Eine Eingabe eines Wertes kleiner 4 bringt somit keinen Nutzen.

4.5.2 Select Sensor



Graphics Selection:

The following parameters can be set for each sensor:

*Activate/deactivate Sensor X:* (box checked/unchecked)

*Sensor Color:* Enter here the desired sensor color, or use the color selector.

*Show extreme values:* If a zoom level is selected in the graph display whereby a display point represents a measurement interval and not an individual measuring pont, this function is used to display the maximum and minimum measured during this interval. If the zoom level is selected so that every measurement value is displayed, this function has no effect. If the function is disabled, the average of the displayed value is shown.

*Scale 1 2 ... x:* With multi-channel units you can display multiple different Y-axes at the same time in the graph. These may show for example different temperature ranges or measurands. Specify here which scale you want to assign the respective sensor to. With single-channel units there is only one scale.

## 4.5.3 Scale Config



Config >> Device >> Graphics >> Scale Config

Scale :

	unit	min	max	auto scale	auto fit
Scale 1	°C	0	40	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Free memory: 48908 bytes



Scale:

The following parameters may be assigned to the scale:

*unit*: The unit you want to display for this scale.

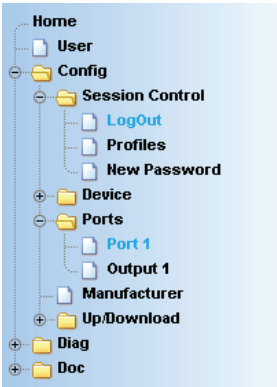
*min*: The lower displayed value on this scale

*max*: The upper displayed value on this scale

*auto scale*: The lower and upper values for this scale are automatically selected for this scale based on the measurement values, so that an optimal, dynamic representation can be achieved. If this function is enabled, the „min“ and „max“ parameters are ignored.

*auto fit*: If this function is enabled, the scale is corrected such that only whole numbers are displayed on the display grid. *Auto fit* automatically enables the *auto scale* function.

4.6 Calibration



The sensor can be calibrated using single-point or two-point reference measurements and corresponding offset value entries

In single-point compensation the entered value is added to the measured temperature value, whereas in two-point compensation a line is calculated for compensating the entire measuring area. To clarify calibration actions, the user in que-

Offset 1 :

Calibration	
Optionally, 1-point or 2-point calibration can be chosen.	
1 point compensation	Only Offset 1 is needed: this offset is added to every measured value.
2 point compensation	Offset 1 is the offset at temperature 1, Offset 2 is the offset at temperature 2. From these 2 offsets, a straight line will be interpolated, from which the offset for each measure value is calculated. The difference between the two temperatures entered here must be greater than 40 °C.
All values in °C in the form xxxx.	

Temperature 1 :

Offset 2 :

Temperature 2 :

Comment : 

Comments: date, name of operator, reference devices

Free memory: 48908 bytes

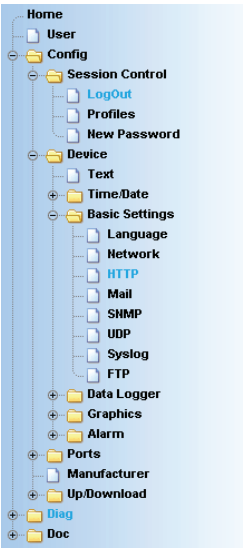
Temporary Storage

Undo

Logout

4.7 HTTP access

Highlight Profile



4.7.1 HTTP



Startup: Specify here which HTML page should be displayed at device startup.

Config >> Device >> Basic Settings >> HTTP

Startup :

index.htm	Show navigation tree as well as page 'home'.
home.htm	Show page 'home' without navigation tree.
user.htm	Show page 'user' without navigation tree.

☐ index.htm  
☒ home.htm  
☐ user.htm

Enable : Device will send header with IP address and its name before each reply to any GET requests which do not come from a browser.

☒ GET Header enable  
☐ GET HTTP enable

HTTP Port: Default: Port 80  
80

Free memory: 48908 bytes

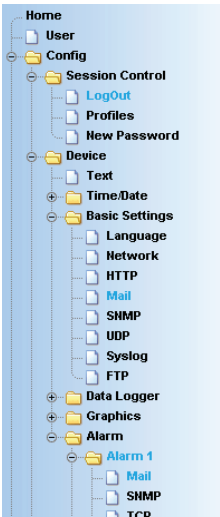
Temporary Storage    Undo    Logout

HTTP Port: You can access the unit through this port. The default is a standard HTTP Port 80. If you want to use a different port, it must be explicitly specified when the page is opened:

```
http://webgraph:<PortNr>
```

4.8 Alarm via E-Mail

Highlight Profile



4.8.1 Basic Settings -> Mail




Here you make the basic settings for sending e-mails

**Config >> Device >> Basic Settings >> Mail**

**Name :**

**ReplyAddr :**

**MailServer :** Name or IP address of the mail server (format xxx.xxx.xxx.xxx).  
 

---


**Authentication :**

- ☐ SMTP authentication off
- ☐ ESMTP
- ☒ SMTP after POP3

**User :**

**Password :**

**Retype Password :**

**POP3 Server :** Name or IP address of the POP3 mailserver (format xxx.xxx.xxx.xxx) only for 'SMTP after POP3'  
 

---

**Enable :** ☒ Mail enable

Free memory: 48908 bytes

The e-mail function allows you to send an information or alarm mail to one or more e-mail or SMS recipients.

**Name:** Enter the name you want to appear for the e-mail recipient.

**ReplyAddr:** The reply address which identifies the unit

**MailServer:** In the next step you set the IP address of your mail server or its host name (for a configured DNS server) you want the

unit to use. If the e-mail port is not the standard Port 25, you can append the port to the address with a colon:

```
mail.provider.de:476
```

**Authentication:** If the mail server requires authentication, set here the corresponding procedure for user identification:

*SMTP authentication off:* No authentication

*ESMTP:* A user name and a password are required for logging in on the mail server.

*SMTP after POP3:* For an SMTP access it is necessary first to access through POP3, so that the user can be identified. For this setting enter also an associated POP3 server.

*Plain SMTP after POP3:* Same as SMTP after POP3, only that a different logon command is used.

*SSL TLS:* Provides an encrypted connection to the mail server. Username and password are required.

**Enable:** Be sure that the „Mail enable“ box is checked for sending e-mail

### 4.8.2 Alarm X



Here the desired alarm conditions are configured.



Config >> Device >> Alarm >> Alarm 1

Trigger : ☒ Sensor 1: Sensor 1  
☐ Timer  
☐ Cold Start  
☐ Warm Start  
☐ Sensor lost

Min : Limit in °C (form: xx.xx).  
15

Max : Limit in °C (form: xx.xx).  
20

Hysteresis : Hysteresis in °C (form: xx.xx).

Rate of change : Limit in °C/min (form: xx.xx, average over a period of 5 min).

Delay Time : The alarm will be send after the alarm condition stay stable during this periode of time (time in minutes).  
1

Interval : Sending interval in minutes  
E

Timer : Alarms will be activated only within predefined time periods.

Input [ Number *, - / ]			
Field	Start	Stop	Range of values
Minute	0	0	0-59
Hour	8	17	0-23 (0 is midnight)
Day_of_month	*	*	1-31
Month	*	*	1-12
Weekday	1-5	1-5	0-6 (0 is sunday)

Enable : ☐ Output switch enable  
☒ Mail enable  
☐ SNMP Trap enable  
☐ TCP Client enable  
☐ Syslog Messages enable  
☐ FTP Client enable

Free memory: 48908 bytes

Temporary Storage Undo Logout

**Trigger:** Define here the triggers for the alarm e-mail. Multiple selections are possible.

**Min./Max.:** Specifies the lower and upper limit value. The range within these limits is considered to be „valid“.

**Hysteresis:** You can also specify a hysteresis value based on which the alarm state is reset.

*Example:*

min. 10°C / max. 18°C / Hysteresis 2°C

If the limit is exceeded the alarm state is reset when 16°C (18-2) is reached and if the lower limit is not reached when a value of 12°C (10+2) is reached.

This function prevents „flickering“ around the limit value.

**Rate of change:** Maximum allowed temperature change within five minutes (1-channel versions only).

**Delay Time:** The alarm is delayed by this time (in minutes) to compensate for momentary limit violations.

**Interval:** Enter here the send interval (in minutes) at which a message should be sent when the alarm is activated. If you only want to send a single message, enter „E“ here.

Timer: Configure here at what time you want to turn the alarm monitor on and off. The interval set here is based on the CRON service as used in Linux/Unix systems. Valid characters are:

**\*** : Represents all valid values in the respective entry field (e.g. all minutes or all hours)

**-** : Specifies a range of from..to. For example weekday „2-4“ stands for Tuesday to Thursday, whereas an entry of „\*“ triggers the timer on all weekdays

**/** : Intervall within the entered range, e.g. minute „0-45/2“ triggers the timer in a range between the 0th and 45th minute every two minutes (0, 2, 4, 6 ,8, 10, ... , 44).

**,** : Sepcifies an absolute value. For example, minute 0, 15, 30 triggers the timer on every hour, at the 15th minute and 30th minute.

Example:

In the following example the alarm monitor is activated from Monday to Friday at 8:00 a.m. and deactivated from Monday-Friday at 5:00 p.m. Outside this time no alarm is displayed or triggered.

Input [ Number * , - / ]			
Field	Start	Stop	Range of values
<b>Minute</b>	0	0	0-59
<b>Hour</b>	8	17	0-23 (0 is midnight)
<b>Day_of_month</b>	*	*	1-31
<b>Month</b>	*	*	1-12
<b>Weekday</b>	1-5	1-5	0-6 (0 is sunday)

Enable: Select the message type here. For an e-mail alarm check the „Mail enable“.box

## 4.8.3 Alarm X -> Mail



Under this menu item you specify the actual contents of the e-mail.

**Config >> Device >> Alarm >> Alarm 1 >> Mail**

**E-Mail-Addr :**

**Subject :**

**Mailtext :**

**Options :**

- ☒ Attach Thermo.csv enable
- ☐ CSV-Data since last report

**Alarm Clear Subject :** This messages will be send if alarm state is cleared.

**Alarm Clear Text :**

Free memory: 48842 bytes

**E-Mail-Addr:** Enter here the recipient e-mail address. If you want to sent the e-mail to multiple recipients, separate the addresses with a semicolon.


**Subject & Mailtext:** Specifies the subject line and mail text for the e-mail. In these text boxes the following tags are also accepted. The device replaces these tags with the respective values:

W&T tag value		Function
comma spelling (##,##)	dot spelling (##.##)	
<T1>	<t1>	Temperature: Displays the current temperature.
<O1>	<o1>	Output: Shows the current output state (ON, OFF)
<RC>	<rC>	Rate of change: Displays the rate of change from the last 5 minutes.
<AA>		Alarm active: Shows all alarms (numbers, komma separatet) which are currently active.
<DN>		Device Name: Shows the device name.

W&T tag date + time		
<Z>		Displays the actual time and date as a string.
<\$y>		Year (###): Displays the year.
<\$m>		Month (##): Displays the month.
<\$d>		Day (##): Displays the day.
<\$h>		Hour (##): Displays the hour.
<\$i>		Minute (##): Displays the minute.
<\$s>		Second (##): Displays the second.

**Attach thermo.csv enable:** The option „Attach thermo.csv enable“ lets you attach the complete content of the data logger in semicolon-separated CSV format. The time base of the output corresponds to the data logger presettings.

 *The file is dynamically generated in the unit, so that assembling the CSV file may take up to 30 seconds for large logger contents. During this time no other e-mails may be sent. Pending alarms are carried out as soon as the mail with attachment has been sent.*

**CSV-Data since last report:** This option causes only the data which accumulated since the last send interval to be written to the CSV file.

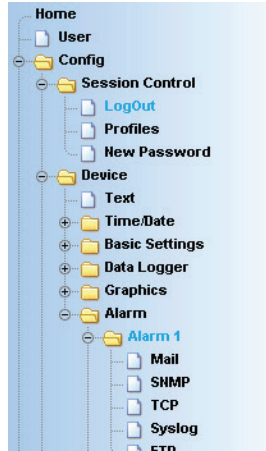
**Alarm Clear Text:** In addition, an Alarm Clear message can be sent when the temperature is restored to the valid range. Here you can use the same tags as for the alarm message.



*Starting from firmware 2.05 the mail appendix will be delivered as packed \*.gz file because of its size. This file can be unpacked or opened with usual pack-tools.*

## 4.9 Alarm via Output

Highlight Profile

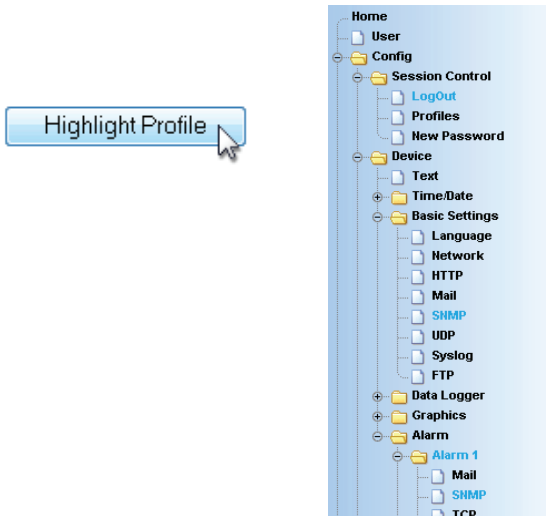


Activate the checkbox „Output switch enable“ in the alarm-configuration. When the trigger level is reached the digital relay output will be set on or off as configured in the port configuration.

**Enable :**

- ☒ Output switch enable
- ☐ Mail enable
- ☐ SNMP Trap enable
- ☐ TCP Client enable
- ☐ Syslog Messages enable
- ☐ FTP Client enable

## 4.10 SNMP incl. alarm via trap



Send alarm messages via SNMP trap.

### 4.10.1 Basic Settings -> SNMP



Here you define the basic settings needed for SNMP opera-

Community String: Read: By using this string you can get read access to temperature values in yhour SNMP manager.

Community String: Write: By using this string you can get both read and write access to the temperature values in your SNMP manager.

Manager IP: Contains the IP address of your SNMP manager. The unit sends the SNMP messages to this address.

System Traps: Two system traps can be generated.

Cold Start: After power is disconnected or fails

Warm Start: At device reset

SNMP Enable: To use the SNMP functionality, check this box.

Config >> Device >> Basic Settings >> SNMP

Community string: Read :

public

Community string: Read-Write :

public

Community string: Trap :

public

Manager IP :

SNMP System Traps:  
Name or IP address of the SNMP manager (format xxx.xxx.xxx.xxx)  
192.168.0.18

System Traps :

☒ Cold Start

☒ Warm Start

☒ Diag Messages

Enable :

☒ SNMP enable

Free memory: 48842 bytes

Temporary Storage

Undo

Logout



#### 4.10.2 Alarm X -> SNMP



Under this menu item the actual contents of the SNMP trap is specified.

**Config >> Device >> Alarm >> Alarm 1 >> SNMP**

**Manager IP :** Name or IP address of the SNMP manager (format xxx.xxx.xxx.xxx)

**Trap Text :**

**Alarm Clear Text :** This messages will be send if alarm state is cleared.

Free memory: 48842 bytes

**Manager IP:** Contains the IP address of your SNMP manager. The unit sends the SNMP messages to this address.

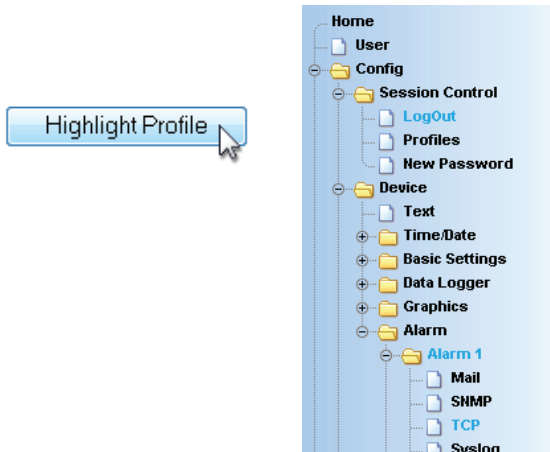
**Trap Text:** Specifies the text for the trap. These text boxes also accept the following tags. The unit replaces these tags with the respective values:

W&T tag value		Function
comma spelling (##,#)	dot spelling (##.##)	
<T1>	<t1>	<i>Temperature</i> : Displays the current temperature.
<O1>	<o1>	<i>Output</i> : Shows the current output state (ON, OFF)
<RC>	<rc>	<i>Rate of change</i> : Displays the rate of change from the last 5 minutes.
<AA>		<i>Alarm active</i> : Shows all alarms (numbers, komma separatet) which are currently active.
<DN>		<i>Device Name</i> : Shows the device name.

W&T tag date + time		
<Z>		Displays the actual time and date as a string.
<\$y>		<i>Year (####)</i> : Displays the year.
<\$m>		<i>Month (##)</i> : Displays the month.
<\$d>		<i>Day (##)</i> : Displays the day.
<\$h>		<i>Hour (##)</i> : Displays the hour.
<\$i>		<i>Minute (##)</i> : Displays the minute.
<\$s>		<i>Second (##)</i> : Displays the second.

Alarm Clear Text: In addition, an Alarm Clear message can be sent when the temperature returns to the valid range. Here you can use the same tags as for the alarm message.

## 4.1.1 Alarm via TCP (Client Mode)



Send alarm messages as a TCP datagram.

### 4.1.1.1 Alarm X -> TCP



IP Addr: The IP address you want to send the message to.

Port: The recipient must have a TCP server on this port which can receive incoming connections.

TCP Text: The text corresponds to the same specifications as apply to the other message types.

Alarm Clear Text: see above

Config >> Device >> Alarm >> Alarm 1 >> TCP

IP Addr :

Name or IP address of the TCP server (format xxx.xxx.xxx.xxx)

192.168.0.14

Port :

8000

TCP Text :

Temperatur too high <T1>°C

Alarm Clear Text :

This messages will be send if alarm state is cleared.

Temperature ok <T1>°C

Free memory: 48842 bytes

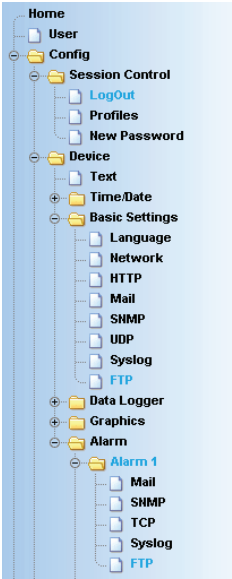
Temporary Storage

Undo

Logout

4.12 Sending alarms via FTP (Client Mode)

Highlight Profile



Write the temperature values directly to an FTP server.

### 4.12.1 Basic Settings -> FTP



Here you find the basic settings needed for FTP operation.

**FTP Server IP:** Enter here the IP address or host name of the FTP server you want to send the data to.

**FTP Control Port:** This is the port needed for the connection. The standard port for FTP accesses is 21. This port is already preset and should work with no problem on most systems. If you require a different port, check with your network administrator.

**User:** Enter the user name required for FTP access.

**Password:** This is the user assigned password.

**FTP Account:** Some FTP servers require a special account entry for login. If this is the case for your server, enter the account name here.

**Options / PASV:** If this option is activated, the server is instructed to work in passive mode. This means the Web-Thermograph opens the data connection. If this option is deactivated, the FTP server opens the data connection. If the server is protected by a firewall, you should activate the PASV option, since otherwise connection attempts could be blocked.

**Enable:** To use FTP functionality, check this box.

Config >> Device >> Basic Settings >> FTP

FTP Server IP :

Name or IP address of the FTP server (format xxx.xxx.xxx.xxx)

192.168.0.5

FTP Control Port :

Port No.: 1...65536 (default 21)

21

User :

user

Password :

password

FTP Account :

account

Options :

Switch FTP server into Passiv Mode.  
(possibly necessary in a firewall environment)

☒ PASV

Enable :

☒ FTP enable

Free memory: 48642 bytes

Temporary Storage

Undo

Logout

4.12.2 Alarm X -> FTP

FTP Local Data Port: This is the local data port on the Web-Thermograph. Values between 1 and 65536 are valid. Entering „AUTO“ causes the device to select the port dynamically.

File Name: Enter here the path to the file the device should access.

FTP Alarm Text: Specifies the text for the FTP contents. The following tags are also accepted in these text boxes. The device replaces these tags with the corresponding values:

W&T tag value		Function
comma spelling (##,.)	dot spelling (##.##)	
<T1>	<t1>	<i>Temperature</i> : Displays the current temperature.
<O1>	<o1>	<i>Output</i> : Shows the current output state (ON, OFF)
<RC>	<rc>	<i>Rate of change</i> : Displays the rate of change from the last 5 minutes.
<AA>		<i>Alarm active</i> : Shows all alarms (numbers, komma separatet) which are currently active.
<DN>		<i>Device Name</i> : Shows the device name.

W&T tag date + time		
<Z>		Displays the actual time and date as a string.
<\$y>		<i>Year (####)</i> : Displays the year.
<\$m>		<i>Month (##)</i> : Displays the month.
<\$d>		<i>Day (##)</i> : Displays the day.
<\$h>		<i>Hour (##)</i> : Displays the hour.
<\$i>		<i>Minute (##)</i> : Displays the minute.
<\$s>		<i>Second (##)</i> : Displays the second.

To insert a line feed after each data send, insert a CRLF by pressing the RETURN key at the end of the line

Alarm Clear Text: This message is sent after the alarm state is over. The above listed tags apply here as well.

Options:

STORE: Stores a file and write the data to it. If this file already exists, it is overwritten.

APPEND: Appends the data to an existing file. If the file does not yet exist, it is created.

Config >> Device >> Alarm >> Alarm 1 >> FTP

FTP Local Data Port : Port No.: 1...65536 or AUTO = assign next free port number.

AUTO

File Name : temperature.txt

FTP Alarm Text : <Z> , <T1>°C

Alarm Clear Text : This messages will be send if alarm state is cleared.

Options :  
☐ STORE  
☒ APPEND

Free memory: 48842 bytes

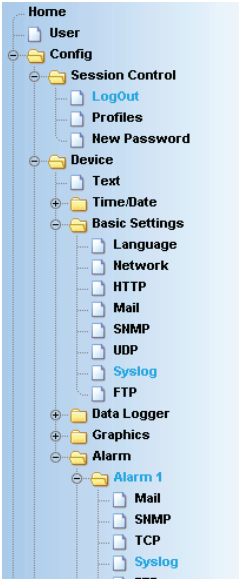
Temporary Storage

Undo

Logout

4.13 Syslog Messages incl. alarm

Highlight Profile



Send alarm messages as a syslog message.



## 4.13.1 Basic Settings -> Syslog



**Server IP:** The IP address you want the unit to send the status messages to.

**Syslog Server Port:** A syslog server service must be present on this port at the recipient. for accepting incoming connections. (Standard: 514)

**System Messages:** Select which status messages you want the unit to send.

**Enable:** Activates/deactivates the syslog function

### Config >> Device >> Basic Settings >> Syslog

**Syslog Server IP :** Syslog System Messages:  
Name or IP address of the Syslog server (format xxx.xxx.xxx.xxx)

**Syslog Server Port :** Port No.: 1...65536 (default 514)

**System Messages :** ☒ Cold Start  
☒ Warm Start  
☒ Diag Messages

**Enable :** ☒ SysLog Messages enable

Free memory: 48842 bytes

## 4.13.2 Alarm X -> Syslog



**IP Addr:** The IP address you want to send the message to.

**Port:** A syslog server service must be present on this port at the recipient. for accepting incoming connections. (Standard: 514)

**Syslog Text:** The text corresponds to the same specifications as for the other message types.

**Alarm Clear Text:** see above

### Config >> Device >> Alarm >> Alarm 1 >> Syslog

**IP Addr :** Name or IP address of the Syslog server (format xxx.xxx.xxx.xxx)

192.168.0.12

**Port :**

514

**Syslog Text :**

Temperature too high! <T1> Output: <O1>

**Alarm Clear Text :** This messages will be send if alarm state is cleared.

Temperature ok <T1> Output: <O1>

Free memory: 48842 bytes

Temporary Storage

Undo

Logout

### 4.14 Time-based report

Timer: The timer interval set here is based on the CRON service as used in Linux/Unix systems. Valid characters are:

\* : Represents all valid values in the respective entry field (e.g. all minutes or all hours)

- : Specifies a range of from..to. For example weekday „2-4“ stands for Tuesday to Thursday, whereas an entry of „\*“ triggers the timer on all weekdays

/ : Intervall within the entered range, e.g. minute „0-45/2“ triggers the timer in a range between the 0th and 45th minute every two minutes (0, 2, 4, 6 ,8, 10, ... , 44).

, : Sepcifies an absolute value. For example, minute 0, 15, 30 triggers the timer on every hour, at the 15th minute and 30th minute.

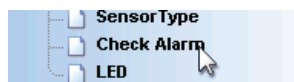
This function requires that the „Timer“ box be checked.

### 4.15 Alarm Reset



The output from the device can be reset to normal state on the start page. If the administrative user is logged in, a Reset button appears next to the output status. After clicking, the output is reset to its initial state regardless of any alarm. If the alarm is triggered again, the output again set to the alarm state.

## 4.16 Check Alarm



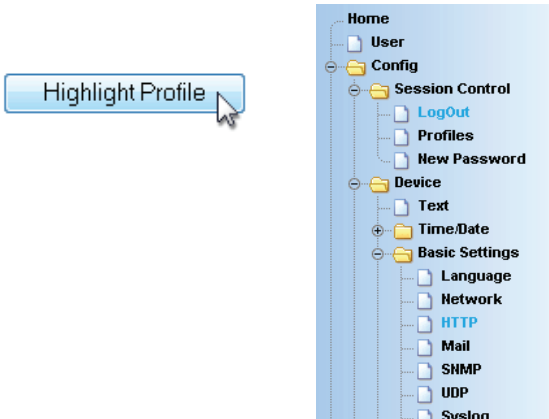
On this configuration page you can test the alarms you set. Clicking on the „Trigger“ button for the respective alarm simulates the presence of an alarm, so that the configured actions can be performed accordingly. Clicking on the „Reset“ button restores the alarm status to normal state.

### Test Alarms WEBIO-03FCD4

No	Name	Test	
1	Alarm 1	Trigger	Reset

last update: Tue, KW42,  
19.10.2010 07:49:53 (UTC +02)

## 4.17 ASCII command strings via TCP Port 80



### 4.17.1 HTTP



The device can also send a header with IP address and name of the device in addition to the temperature when an HTTP Get command is used to query. To do this, check the corresponding box. If this function is disabled, only the tempera-

Config >> Device >> Basic Settings >> HTTP

Startup :

index.htm	Show navigation tree as well as page 'home'.
home.htm	Show page 'home' without navigation tree.
user.htm	Show page 'user' without navigation tree.

☐ index.htm  
☒ home.htm  
☐ user.htm

**Enable :** Device will send header with IP address and its name before each reply to any GET requests which do not come from a browser.

☒ GET Header enable  
☐ GET HTTP enable

**HTTP Port :** Default. Port 80

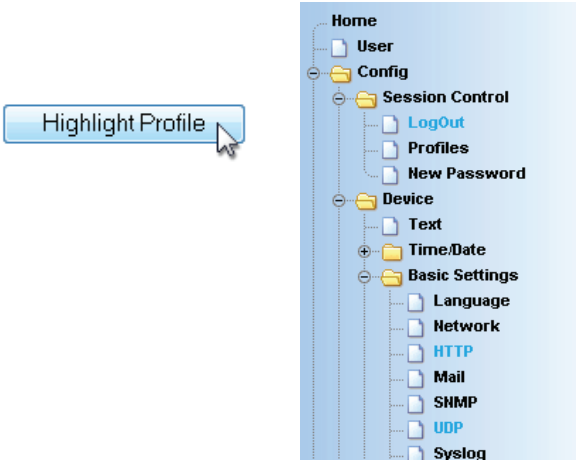
80

Free memory: 48842 bytes

Temporary Storage Undo Logout

The *GET HTTP enable* function causes a complete HTTP header to be sent with the device response. This is required for example when querying from mobile applications.

4.18 ASCII command strings via UDP



In addition to TCP/IP commands, the device can also reply to UDP datagrams. This requires that the port you want the device to use for „listening“ be specified. The default is 42279. The Enable function activates UDP.

Config >> Device >> Basic Settings >> UDP

Port : Port No.: 1...65535  
42279

Enable : ☒ UDP enable

Free memory: 48842 bytes

Temporary Storage    Undo    Logout

Here again setting of the header which can be appended to the temperature applies.

## 4.19 UP-/Download



In the Download area you can download the XML configurations as well as the three user pages (home.htm, user.htm, log.htm) for further editing.

With XML-Download you can read the settings for the Web-Graph Thermometer, make any changes, and use XML Upload to load them back into the unit.



*Some Web browsers only output the correct code using „View -> Show (Frame-) source text“ after the „XML Download“ button has been clicked.*

For the XML upload you create or modify a text file with the corresponding parameters and load this file into the unit. The Web-Thermograph configuration must begin with the expression

```
<io-AN1PT_SW.1>  
and end with the expression
```

```
</io-AN1PT_SW.1>
```

The sequence of the parameters to be set corresponds to the sequence of the configuration menu starting with „Device“.

The syntax for configuration via XML is as follows:

```
<Option>  
  <Parameter1> VALUE </Parameter1>  
  <Parameter2> VALUE </Parameter2>  
</Option>
```

The individual options and parameters correspond to the configuration points in the browser menu.



*Please note that, especially for mass update configurations, the IP address stored in the XML file must also be sent and only then adapted.*

In addition, in the Upload area you can replace the user pages (user.htm, home.htm, log.htm).

An example can be found in the Appendix (example for creating your own Web pages).

Use the menu item „Upload -> GIF“ to replace the logo shown in the menu and save it directly in the unit.



## 4.20 RSS-Feed



The device supplies a RSS feed, which can be subscribed by feed readers. The configuration can be found under Basic Settings >> RSS..

**Config >> Device >> Basic Settings >> RSS**

Channel Title :

Channel Link :

Channel Description :

Channel Image :

Image Title :

Image Link :

Item Title :

Item Link :

Item Description :

Item Quantity :

Enable : ☒ RSS enable

Free memory: 47839 bytes

Channel Title: Headline, which will be indicated within the feed.

Channel Link: This link will be called after a clicking the title.

Channel Description: Optional, additional information about the content of the feed.

Channel Image: Path to an image, which will be shown within the feed.

Image Title: Optional title for the image.

Image Link: This link will be called after a clicking the image.

Item Title: Headline for the separate items.

Item Link: This link will be called after a clicking the item.

Item Description: Optional, additional information about the content of the item.

Item Quantity: Quantity of displayed items within the feed. These items are always the last available saved values.

In all textboxes the following tags can be used to display the measured values:

<T1>, <O1>      show the temperature and output states.

<Z>      shows the time and date information.

and all W&T-tags for date und time:

<\$d>, <\$m>, <\$y>, <\$h> , <\$i>, <\$s>

## 5 Single Temperature Polling

### 5.1 Temperature polling using TCP/IP

It is possible to manually poll the current temperature values in CSV format using a socket connection (comma-delineated data). This function is also used to poll the individual data without using the Web interface.

To do this, send the following string to Port 80:

```
GET /Thermo.csv
```

This expression may also be given additional parameters that determine the content:

```
start=ttmmyyyThhmmss
```

Start date and time of the desired values.

```
end=ttmmyyyThhmmss
```

End date and time of the desired values.

```
DTb=x&
```

Desired interval where x =

```
1 -> 15 sec.
```

```
2 -> 30 sec.
```

```
3 -> 1 min.
```

```
4 -> 5 min.
```

```
5 -> 15 min.
```

```
6 -> 60 min.
```

The expression must begin with „?“ after the filename. Each variable must be separated with a „&“ .

Example:

```
http://<ip-address>/thermo.csv?start=01012010T123000&end=30032010T200000&DTb=5&
```

This expression generates a CSV file containing the data from 01.01.2010, 12:30h up to 30.03.2010, 20:00h in 15 minute intervals.

To poll the individual, current temperature value, send:

```
GET /Single1
```

To poll the output status, send:

```
GET /Single2
```

To poll the temperature and output status at the same time, use the command:

```
GET /Single
```

### 5.2 Temperature polling using UDP

Open a UDP connection to the IP address of the device or to the Net-ID as a broadcast and Port 42279 (default may be changed).

Send the device one of the GET /Single expressions given under 4.1 and the device will return the value to the port you are using.



*When using more than one unit, it can be practical with broadcast sends to also have the name and IP address of the unit output. To do this check „GET Header enable“ under „Config >> Device >> Basic Settings >> HTTP“.*

### **5.3 Temperature polling using SNMP**

The sensor can be directly polled using SNMP Get instructions. Reach the sensor using the following path:

<IP address> 1.3.6.1.4.1.5040.1.2.23.1.7.1.1.1 = shows the output state (1 or 0).

<IP address> 1.3.6.1.4.1.5040.1.2.23.1.3.1.1.1 = temperature with one decimal place and comma separation.

<IP address> 1.3.6.1.4.1.5040.1.2.23.1.4.1.1.1 = temperature value as 3-place integer, no comma separation.

<IP address> 1.3.6.1.4.1.5040.1.2.23.1.8.1.1.1 = temperature with one decimal place and dot separation.



*To poll, specify the configured SNMP Read or Read/Write community*

An MIB for incorporation into management applications is available for downloading on the data sheet page on the WuT homepage <http://www.wut.de>. In addition, you will find the MIB file directly in the device. This can be downloaded from the following address:

<http://<ip-adresse>/mib.zip>

If you would like to use SNMP for changing settings in the device (IP address, subnet mask etc.), you must first use your SNMP manager to start a session on the device.

Entering the administrator password into the variable

```
wtWebioANlgraphptswSessCntrlPassword
```

opens a session. Reading out the variable

```
wtWebioANlgraphptswSessCntrlConfigMode
```

allows you to check whether the session was successfully opened.

- 1 = Session open, device in configuration mode.
- 0 = Opening of the session failed. Check whether the password was incorrectly entered.

After successful opening of the session you can make any desired configuration changes using the variables defined in the private MIB.

When finished setting the configuration, writing the variable

```
wtWebioANlgraphptswSessCntrlLogout
```

closes the session.

```
wtWebioANlgraphptswSessCntrlLogout =
```

- 1 All changes will be saved
- 2 Quit without saving

If during a session no SNMP communication has taken place within 5 minutes, the device closes the session and all changes are cancelled.



*Opening an SNMP session has priority over an HTTP login. This means: a user with Config. or Administrator rights loses his browser access as soon as an SNMP session is opened.*

The description for the individual SNMP variables, OIDs etc. can be found in the private MIB.

## 6 Linking the temperature to your own Web site

You have the option of using an implemented Java applet to integrate the temperature on your own Web site. The applet is updated every 60s. An example for this applet is already in the unit:

`http://172.0.0.10/app.htm`

To add the applet for temperature monitoring to the HTML page, the following HTML tag must be inserted in place of the applet:

```
<Applet Archive="A.jar" Code="A.class" Codebase="Http://WebTherm/"
Width="breite" Height="Höhe">
```

Now the following parameters can be optionally specified:

Background color:

```
<Param Name="BGColor" Value="#RGB value">
```

Text color:

```
<Param Name="FGColor" Value="#RGB value">
```



*The RGB value is given as a 24-bit hex value.  
E.g.: Value="#2F3C09" The value is not case-sensitive.*

Specifying the text alignment:

```
<Param Name="Align" Value="const">
```

*const* must be one of the following constants:

- Left
- Center
- Right

The specification is not case-sensitive.

If a parameter is omitted or incorrectly placed, the following standard values are used:

BGColor	#FFFFFF (white)
FGColor	#000000 (black)
Align	Right

Select the sensor using the parameter

```
<Param Name="Sensor" VALUE="1">
```

The temperature value is specified using the value 1, and the output status using the value 2.

Specify the unit using the parameter

```
<Param Name="unit" VALUE="°C">
```

The parameter is a string type. If it is not specified, „C“ is automatically set.

To use your own Java functions for accessing multiple device applets, use the parameter

to number the applets for each device, beginning with 0.

Polling of the devices is turned

Use the parameter

```
<Param Name="sensorpolling" VALUE="on">
```

to turn polling of the devices off and on. The default value is „on“.

To use a different polling rate than the preset 60 seconds, use the parameter

```
<Param Name="pollingrate" VALUE="60000">
```

in ms units. Note that a new value is present no sooner than every 4 seconds.



To output an error message when there are problems opening a connection, turn them on and off using the parameter

```
<Param Name="showerrors" VALUE="on">
```

The default value is „off“.

Once all the parameters have been specified, you must finish the HTML tag with </Applet>.

### Example:

```
<Applet Archive="A.jar" CODE="A.class"
Codebase="http://192.168.0.10" Width="300" Height="100">
<Param Name="unit" VALUE="°C">
<Param Name="device" VALUE="0">
<Param Name="BGColor" Value="#0000FF">
<Param Name="FGColor" Value="#FF0000">
<Param Name="Align" Value="Center">
<Param Name="Sensor" Value="1">
</Applet>
```

The font size is automatically calculated from the size of the applet..

### 6.1 Controlling the Java applet with Java Script

To be able to use control of the Java applet using Java script, the addition „mayscript“ must be indicated in the opening of the applet:

```
<Applet Archive="A.jar" CODE="A.class"
Codebase="http://192.168.0.10" Width="300" Height="100"
mayscript>
```

To be able to work with the applet, the corresponding Java-Script function must be declared in the header of the Web page.

The following read functions are used for this:

```
function sensorChanged( iDevice, iSensor, iVal )
{
  program code executed when there are changes on the inputs
}
```

The preceding function is opened by the applet when a temperature change is detected on the sensors. *iDevice* indicates on which Web-Thermograph a value changed, and *iSensor* which sensor changed. The variable *iVal* represents the current temperature value or output status.



*Please note that the names of the functions are case-sensitive.*

The following source text shows a short example for dynamic display of Sensor 1 and the output status.

```
<!doctype html public "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>
<head>
<script language="JavaScript" type="text/javascript">
  function Temp (iVal, iSensor)
  {
    document.getElementById('temptab0').firstChild.data = iVal+'°C';
    document.getElementById('temptab0').style.fontSize='20';
    document.getElementById('temptab0').style.color= '167A1E';
  }

  function Output (iVal, iSensor)
  {
    document.getElementById('temptab1').style.fontSize='20';

    if (iVal==0){
      document.getElementById('temptab1').firstChild.data = 'OFF';
      document.getElementById('temptab1').style.color= '167A1E';
    }
  }
```

```

if (iVal==1){
    document.getElementById('temptab1').firstChild.data = 'ON';
    document.getElementById('temptab1').style.color= 'FF0000';
    }

}

function sensorChanged( iDevice, iSensor, iVal )
{
    if (iSensor==0){Temp (iVal)};
    if (iSensor==1){Output (iVal)};
}
</script>
</head>
<body style="background-color: #79ACDF; font-family: Arial, Helvetica, sans-serif;"
>

<div align="center"><noscript> JavaScript is not activated or not supported</
noscript>

    <p><applet name="Analog" archive="A.jar" code="A.class"
codebase="http://10.40.27.20" height="0" width="0" mayscript>
    <param name="device" value="0">
    <param name="showerrors" value="off">
    <param name="sensorpolling" value="on">
    <param name="pollingrate" value="4000">
    Java ist nicht aktiviert oder wird nicht unterst&uuml;tzt
    </applet></p>

    <table width="400" border="0" cellspacing="1" cellpadding="1" align="center"
bgcolor="#0099FF">
    <tr>
    <td bgcolor="FFFFFF" height="85">
    <div align="center">
    <p><b><font size="4">Sensor-Visualization<br>
    </font></b><font size="2"><b><font size="1">Example for using the
internal Java-Applet<br>
    </font></b></font><b><font size="2"><br>
    Web-Thermograph Relais #57616</font></b></p>
    </div>

```

```

</table>
<br>
<table width="220" border="0" cellspacing="1" cellpadding="1" align="center"
bgcolor="#0099FF" height="87">
  <tr>
    <td bgcolor="#FFFFFF" height="81">
      <div align="center"><font size="2" face="Verdana, Arial, Helvetica, sans-
serif"><br>
        </font>
      <table width="200" border="1" cellspacing="0" cellpadding="0"
bordercolor="#FFFFFF" align="center">
        <tr bgcolor="#CCCCCC">
          <td id="temptab0" align="center" >0</td>
          <td id="temptab1" align="center" >0</td>
        </tr>
        <tr bgcolor="#999999">
          <td width="50%">
            <div align="center"><font size="2" color="#FFFFFF">Temperature
          </font></div>
          <td>
            <td width="50%">
              <div align="center"><font size="2" color="#FFFFFF">Output
            </font></div>
          </td>
        </tr>
      </table>

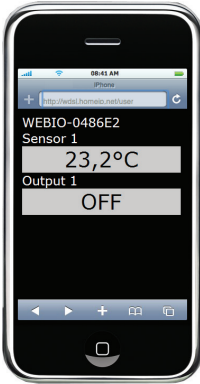
    </div>
  </td>
</tr>
</table>
</div>
</body>

```

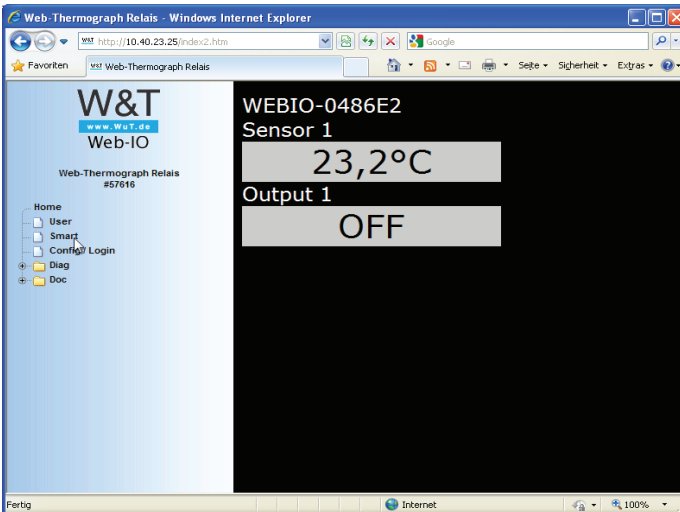
**A** complete example for use of the Java applet is found on the Web page [app.htm](http://ip-address/app.htm), which can be opened in the Web-IO.

Open: <http://ip-address/app.htm>

## 7 Display of measured values on smartphones



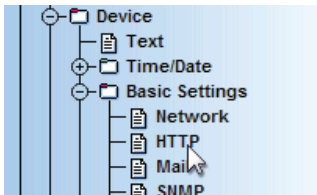
In order to view the values comfortably on mobile phones and smartphones, the device has a preconfigured web page that is adjusted to the specific proportions. This can be directly accessed from the configuration menu via the entry „Smart“.



The right frame now shows the system name of the device. The names of the available sensors are displayed, including their values.

The page can be accessed directly through the browser via `http://<ip-address>/smart.htm`. With this call, the page will be displayed without the configuration menu.

The page `smart.htm` can be set as startup page. To do this, configure it in `Config -> Device -> Basic Settings -> HTTP`.



Config >> Device >> Basic Settings >> HTTP

**Startup :**

Startup page	
index.htm	Show navigation tree as well as page 'home'.
home.htm	Show page 'home' without navigation tree.
user.htm	Show page 'user' without navigation tree.
smart.htm	Show page 'smart' without navigation tree.

☐ index.htm  
☐ home.htm  
☐ user.htm  
☒ smart.htm

**Enable :** Device will send header with IP address and its name before each reply to any GET requests which do not come from a browser.

☒ GET Header enable  
☐ GET HTTP enable

**HTTP Port :** Default. Port 80

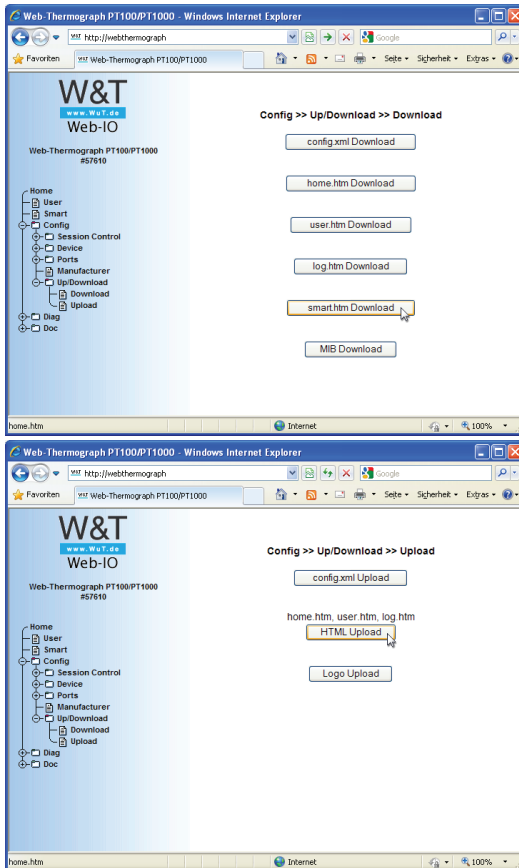
Free memory: 43901 bytes

Temporary Storage

Undo


Logout

The page smart.htm can also be customized to your needs by selecting it via the menu Config -> Up / Download -> Download, editing it and uploading it back into the device via Config -> Up / Download -> Upload.



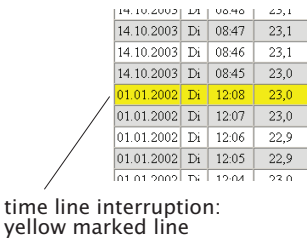
8 Data Logger


The Web-Thermograph stores all the measurement values in a ring memory, so that they remain intact even after power is lost or after pressing the Reset button.

 The measurement data in the data logger can be opened from the user page of the device (Home -> User or <http://xxx.xxx.xxx.xxx/user.htm>).

In menu item *Config -> Device -> Data Logger -> Memory* you can clear the memory.

An interruption in the time line, caused for example by a reset or a subsequent time server synchronization, is shown on the data logger page as a yellow line.



 With set alarm limits, temperatures not lying within the valid range are highlighted in red.



## **9 Appendix**

### **9.1 Alternative IP address assignment methods**

#### **9.1.1 Using DHCP-/BOOTP protocol**

Many networks use DHCP (Dynamic Host Configuration Protocol) or BOOTP for centralized, dynamic IP address assigning. Which of the two protocols is used in a given case makes no difference as far as the Web-Graph is concerned, since DHCP is simply a downward compatible extension of BOOTP. DHCP servers can therefore also handle requests from BOOTP clients.

The following parameters can be assigned to the Web-Thermograph using these protocols:

- IP address
- Subnet mask
- Gateway address

How it works

To obtain an IP address, the device sends a corresponding BOOTP request as a broadcast to the network after each new startup. The reply generated by the DHCP/BOOTP server contains the IP address, the subnet mask and gateway address. The Web-Thermograph immediately places this information in its non-volatile memory.

When starting up the device in DHCP/BOOTP networks, contact the responsible system administrator. If using DHCP for address assignment, you must also make it clear that a reserved IP address is required. To incorporate this into the respective address database, the administrator needs the Ethernet address of the Web-Graph Thermometer, which can be found on the housing sticker.

After the necessary entries have been made, the device automatically obtains the desired IP address after every reset. To ensure that the Web-Thermograph can be reached even should the DHCP/BOOTP server go down, the present IP address is retained when there is no response.



*In DHCP environments the IP address you assign must be reserved by means of a fixed connection to the Ethernet address of the Web-Thermograph. Under Windows NT you do this in the DHCP manager under the menu item „Reservations.“ Linux provides the file „dhcpd.conf“ for this purpose, where you need to make a corresponding entry.*



*If you change this option in the Web configuration, the change to the checkbox is not updated until after a device reset.*

### 9.1.2 ...using ARP command

The prerequisite is a PC which is located in the same network segment as the Web-Thermograph and on which the TCP/IP protocol is installed. Read off the MAC address of the device (e.g. EN=00C03D0012FF). Under Windows you first ping another network node and then using the command line described below to insert a static entry into the ARP table of the computer:

```
arp -s <IP address> <MAC-address>
```

e.g. under Windows:

```
arp -s 172.0.0.10 00-C0-3D-00-12-FF
```

e.g. under SCO UNIX:

```
arp -s 172.0.0.10 00:C0:3D:00:12:FF
```

Now ping the device again (in our example ping 172.0.0.10).  
The IP address is now stored in the non-volatile memory.



*This method can only be used if no IP address has been assigned to the Web-Thermograph yet, i.e. the entry is 0.0.0.0. To change an already existing IP address, you must open the configuration menu from your browser or select the path using WuTility.*

### 9.1.3 ...using RARP server (UNIX only)

Working with an RARP server activated under UNIX is based on entries in the configuration files `/etc/ethers` and `/etc/hosts`. First add a line to `/etc/ethers` with the assignment of the Ethernet address of the Web-Thermograph with the desired IP address. In `/etc/hosts` the link with an alias is then specified. After you have connected the device in the network of the RARP server, you can assign the desired IP address to the unit over the network.

#### **Example:**

Your Web-Thermograph has MAC address EN=00C03D0012FF (sticker on the housing). You want to give it IP address 172.0.0.10 and alias WT\_1.

Entry in the file `/etc/hosts`: 172.0.0.10 WT\_1

Entry in the file `/etc/ethers`: 00:C0:3D:00:12:FF WT\_1

If the RARP daemon is not yet activated, you must start it using the command „`rarpd -a`“.

## 9.2 Example for creating your own Web pages

You can freely configure the standard display pages of the device (user.htm, home.htm, log.htm). Special control elements can also be inserted into the page using „Tags“. In the following you will find an example for creating the „user.htm“ page.

Create an HTML file which must begin with the expression

```
<user.htm> (or log.htm / home.htm)
```

Then enter the HTML code.

You are able to display the following parameters on your pages:

```
<w&t_tags=t1>
```

displays the current temperature.

```
<w&t_tags=o1>
```

displays the output status.

```
<w&t_tags=time>
```

inserts the current time.

```
<w&t_tags=steps>
```

inserts a list box for selecting the time intervals you want to display.

```
<w&t_tags=ok_button>
```

inserts an „OK“ button which sends the selected parameters to the device.

```
<w&t_tags=session>
```

inserts an invisible session controller, so that the user is not logged out from the device when leaving the page. The expression is only needed if you want to design your own button for sending. Insert this expression then between *<form*

Background color:

You can assign different background colors to values shown in tables depending on the sensor state:

```
<w&t_tag=bct>
```

describes a background color which depends on the alarm status of the temperature sensor. If there is a limit violation, this color is red. Otherwise the tag does not describe an explicit color. This tag is required for example to show limit violations in the log table in red.

```
<w&t_tags=sensor1>
```

```
<w&t_tags=output1>
```

inserts the name of the sensor or output into the page and contains a link to the complete sensor description.

```
<w&t_tags=device_name>
```

inserts the assigned device name.

```
<w&t_tags=device_text>
```

inserts a freely configurable, descriptive text for the device.

```
<w&t_tags=location>
```

```
<w&t_tags=contact>
```

inserts the respective text modules which are configured under Config >> Device >> Text.

```
<w&t_tags=reload_button>
```

inserts a „Reload“ button for refreshing the current page.

```
<w&t_tags=previous_button>
```

```
<w&t_tags=next_button>
```

inserts a button for paging ahead or back through the table.

**■** *The „Previous“ button and the „Next“ button only have any function in the „log.htm“ file.*

```
<w&t_tags=logtable>
```

inserts a table with the current measurement values. In this table you can only navigate forward and backward on the „log“ page using the „Next“ and „Previous“ buttons (see above). Only the current measurement values can be displayed on the two other pages (user.htm, home.htm).

Example for setting a background color in a table:

```
<tr>
  <td colspan="3" align="center">
    <table border="2">
      <tr>
        <th><w&t_tags=sensor1></th>
      </tr>
      <tr>
        <td <w&t_tags=bct>><w&t_tags=t1> &deg;C</td>
      </tr>
    </table></td>
</tr>
```

If there is a limit violation, the temperature is shown in red.

To specify the output format of the data, insert the following line into your document:

```
<form action="log.htm" method="POST" >
....
</form>
```

CSV output can be specified using the expression

```
<form action="thermo.csv" method="POST" >
....
</form>
```



*Resetting the device to its factory defaults restores the original HTML pages.*

Example user.htm:

```
<user.htm>
<html>
<head>
<title>Untitled Document</title>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
</head>

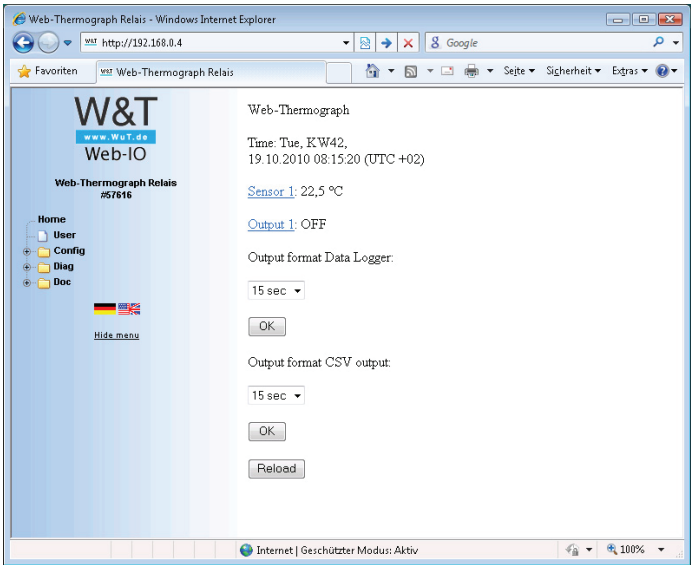
<body bgcolor="#FFFFFF" text="#000000">
<p>Web-Thermograph</p>
<p>Time: <w&t_tags=time></p>
<p><w&t_tags=sensor1>: <w&t_tags=t1> °C</p>
<p><w&t_tags=output1>: <w&t_tags=o1></p>

<form action="log.htm" method="POST">
  <p>Output format Data Logger:</p>
  <p><w&t_tags=steps></p>
  <p><w&t_tags=ok_button></p>
</form>

<form action="thermo.csv" method="POST">
  <p>Output format CSV output:</p>
  <p><w&t_tags=steps></p>
  <p><w&t_tags=ok_button></p>
</form>

<form action="user.htm" method="GET">
  <p><w&t_tags=reload_button></p>
</form>
</body>
</html>
```

The Web-Thermograph displays this page in the Web browser as follows:





Example log.htm:

```
<log.htm>
<html>
<head>
<title>Untitled Document</title>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
</head>

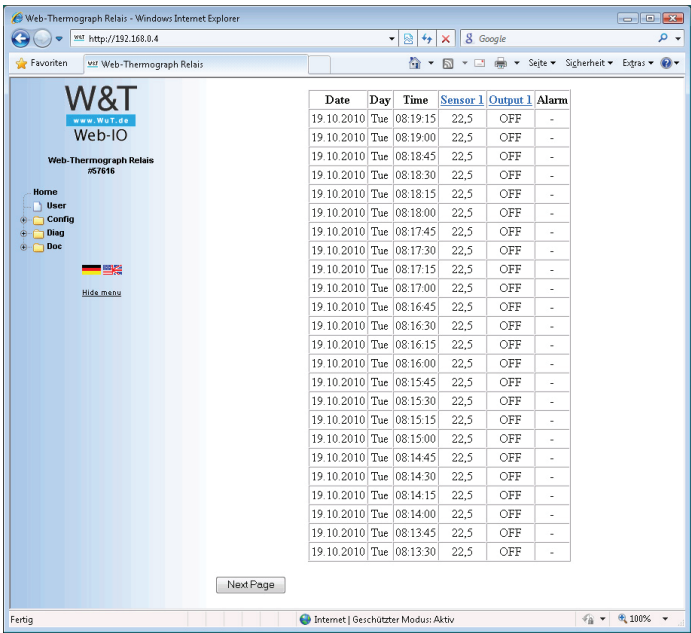
<body bgcolor="#FFFFFF" text="#000000">

<form action="log.htm" method="POST">
  <w&t_tags=previous_button>
</form>

<w&t_tags=logtable>

<form action="log.htm" method="POST">
  <w&t_tags=next_button>
</form>
</body>
</html>
```

The Web-Thermograph displays this page in the Web browser as follows:



9.3 Firmware update

The operating software of the Web-Thermograph is being continually developed. The following section therefore describes the procedure for uploading the firmware.

- Where can I find the current firmware?
- Firmware update over the network under Windows

9.3.1 Where can I find the current firmware?

The latest firmware including the available update tools and a revision history is published on our Web site at:

*<http://www.wut.de>*

Please write down the 5-digit model number found on the housing before downloading. From the homepage you reach the Product Overview arranged by article numbers, from which you can go directly to the data sheet for the device. Here you follow the link to the current version of the firmware.

### **9.3.2 Firmware update over the network using Windows**

Prerequisite is a PC running Windows 9x/NT/2000/XP with a network connection and activated TCP/IP stack. For the update process you need two files, which as already described are available for downloading at *<http://www.wut.de>*.

- The executable update tool for sending the firmware to the Web- Thermograph
- The file with the new firmware you want to send to the Web- Thermograph

No special preparation of the Web-Thermograph is necessary for the firmware update.

The *WuTility* used for the update detects all the WuT devices located in your network and is for the most part self-explanatory.

you do have questions or anything is unclear, please refer to the associated documentation or online help.



*Never intentionally interrupt the update process by turning off power or pressing the Reset button. After an incomplete update the Web-Thermograph will be unusable.*

*Never mix files with different version numbers in the file names. This will result in rendering the device unusable.*

*The Web-Thermograph automatically recognizes when transmission of the new operating software is complete and then automatically performs a reset.*

### **9.3.3 LED indicators**

- Power-LED: Indicates the presence of power. If the LED is not on, please check for correct connection of the power supply.
- Status-LED: Flashes whenever there is network activity with the Web-Thermometer. Periodic flashing indicates Ready.
- Error-LED: The Error LED uses various flashing codes to indicate error states on the device or network port.

1x flashing of theError-LED = Check network connection.  
The Web-Thermograph is not receiving a link pulse from a hub/switch. Check the cable or the hub/switch.

2x or 3x flashing of the Error-LED = Interrupt the power to perform a reset. If this does not eliminate the error, return the device to its factory default settings. Since all the network setting will also be resete, you should write down your current network settings.

Config -> Session Control -> LogOut -> Restore Defaults

After a reset the device is restored to its factory default settings. Reconfigure the network settings.

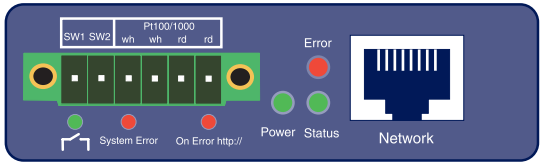
Power-LED +Status-LED +Error-LED on = Self-test error

The self-test performed after each start or reset of the Web-Thermograph could not be correctly finished, for example due to an incomplete firmware update. The device is no longer operational in this state. Please return the device for service.

Auxiliary LEDs

- » on error http:// -LED: Indicates internal configuration errors. For troubleshooting open the page `http://<ip-address>/diag` in the unit.
- » system error: Serious hardware error. Try to restart the unit by cycling power. If the condition persists, please return it for service.

**!** *If the Web-Thermograph does not have an IP address or the address is 0.0.0.0, the LEDs on error and system error will remain on after a reset or new start! The system error LED will flash 3x after a short time. Only when an IP address has been assigned will the LEDs go out.*



## 9.4 Emergency access

The device can be reset to its factory default settings as follows:

### 1. Open the housing

The DIN rail housing is opened by plugging in the 6-pin connector. After tightening both the screws, the board can be drawn out of the housing by pulling on the connector.

### 2. Insert module jumper

An open jumper location is located on the separate module. Close this jumper and be sure that a network cable with a link to a hub/switch is connected to the device.

### 3. Reset

Turn the device on with the jumper in. The device flashes the „System Error“ several times and the „On Error http://“ LED comes on. After approx. 30 seconds the device is reset to its factory default settings. Open the jumper and close up the housing.



*Resetting can only be done with the jumper in on the module board. Please leave the two other jumpers on the motherboard open at all times!*

**9.5 Technical data**

<b>Prod. No.:</b>	<b>57616</b>
Thermo-Probe:	Pt100/Pt1000-Connection via screw terminal
Network:	10/100BaseT autosensing
Supply voltage:	Power-over-Ethernet (PoE) or via screw terminal with DC 24V .. 48V (+/-10%) or AC 18Veff .. 30Veff (+/-10%)
<b>Measuring unit</b>	
Sensor:	Pt100/Pt1000-Connection, 2-,3- or 4-wire
Measuring range:	W&T Sensor: -50°C...180°C PT100/PT1000-Input: -200°C...650°C
Resolution:	1/10°C
Measuring error:	
Measuring unit:	±0,3°C, ±0,2%
PT100/1000 Sensor Class A:	±0,15°C, ±0,2%
Storage frequency:	15, 30 sek, 1, 5, 15, 60 min
Memory depth (6MB):	min. 28 weeks, max. 99 years
Deviation of the internal clock:	max. 1 min. / month
<b>Semiconductor-Relaiy-Output</b>	
Digital output:	1 potential-free semiconductor-relay
max. switching current:	AVG 300mA AC/DC (peak 500mA)
max. switching voltage:	39V AC/DV
max. power consumption:	11,7W AC/DC
<b>Other data</b>	
Measuring frequency:	4 seconds
Galvanic isolation:	Measurement inputs to network: min. 500V
E-mail function:	Mail for sending alarms or as reporting function
Supply voltage:	Power-over-Ethernet (PoE) or via screw terminal with DC 24V .. 48V (+/-10%) or AC 18Veff .. 30Veff (+/-10%)
Current consumption:	AVG: 80mA @24VDC, 110mA @18VAC Max: 90mA @24VDC, 50mA @48VDC PoE Class 1 (0,44 - 3,84W)
Housing:	Plastic compact housing, 105x75x22mm
Weight:	approx. 200g
Ambient storage temperature:	-40...+70°C
Ambient operating temperature:	0 .. +60°C



## 9.6 Disposal

This device contains a non-rechargeable lithium button battery type BR (lithium carbon monofluoride) for retaining the time even when the device is turned off. This battery must be disposed of after its useful life has expired. Take it to an official collection site for recycling.

First disconnect all cables and sensors from the device.

Screw the 6-pin screw terminal strip on and open the housing by gently pulling on the terminal.

Remove the screw joining the two circuit boards and remove the upper circuit board.

The button battery is located at the rear of the circuit board. Remove it from its holder and take it to a recycler.

