

Manual

Web-Thermograph

US 1.06 07/2005 ML



Type
Model
Release

10/100BaseT, 12-24V
57605
1.06, Jul 2005

© 07/2005 by Wiesemann und Theis GmbH
Microsoft, MS-DOS, Windows, Winsock and Visual Basic
are registered trademarks of the Microsoft Corporation

Subject to errors and changes:

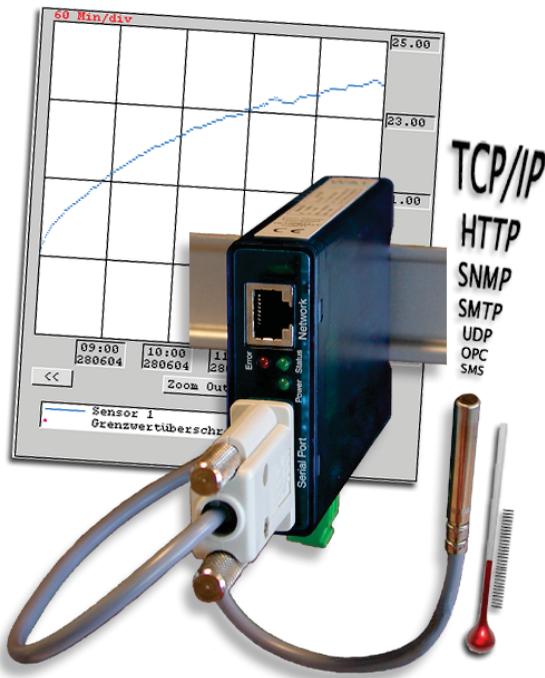
Since we can make mistakes, none of our statements should be used without checking. Please let us know of any mistakes or misunderstandings you are aware of, so that we can recognize and eliminate them quickly.

Perform work on and with W&T products only as described here and only if you have read and understood the manual fully. Unauthorized use can result in hazards. We are not liable for the consequences of unauthorized use. When in doubt, check with us or consult your dealer!

Introduction

The W&T Web-Thermograph includes all the functions in one box for measuring, storing and displaying your temperature data. Numerous alarm functions are also available which can be custom incorporated into your own applications or into existing systems.

This manual contains all the information you need to install, configure and operate the Web-Thermograph.



Contents

- Introduction 3**

- 1 Quick start / Commissioning 6**
 - 1.1 Connecting the power supply 6
 - 1.2 Connecting the NTC sensor 6
 - 1.3 Assigning the IP address using „WuTility“ 7
 - 1.4 Assigning the basic network parameters 9

- 2 Additional basic settings 12**
 - 2.1 Configuring of port and device name 12
 - 2.2 Lokal clock settings 13
 - 2.3 Automatic clock settings with the network time service ... 16
 - 2.4 Configuration of the data logger 17
 - 2.5 Configuration of the graphics display 19
 - 2.6 Calibration 21
 - 2.7 HTTP access 23
 - 2.8 Alarm via E-Mail 24
 - 2.9 SNMP incl. alarm via trap 30
 - 2.10 Alarm via TCP (client mode) 33
 - 2.11 Sending alarms via FTP (Client Mode) 34
 - 2.12 Sending alarms via Syslog 38
 - 2.13 ASCII command strings via TCP Port 80 39
 - 2.14 ASCII command strings via UDP 40
 - 2.15 UP-/Download 41

- 3 Single querying of temperatures 43**
 - 3.1 Querying temperature via TCP/IP 43
 - 3.2 Temperature querying via UDP 43
 - 3.3 Temperature querying using SNMP 44

- 4 Adding the temperature into your own web page 46**

- 5 Data logger 48**

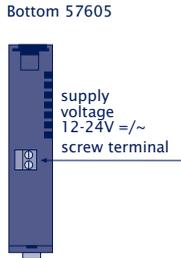
- 6 Appendix 49**

- 6.1 Alternate methods of IP address assignment 49
- 6.2 Example for creating your own Web pages 54
- 6.3 Extending the NTC cable 61
- 6.4 Firmware Update 62
 - 6.4.1 Where do I obtain the current firmware? 62
 - 6.4.2 Firmware-Update over the network
using Windows 62
 - 6.4.3 LED indicators 64
- 6.5 Emergency access 66
- 6.6 Technical Data 67
- 6.7 Declaration of Conformity 68

1 Quick start / Commissioning

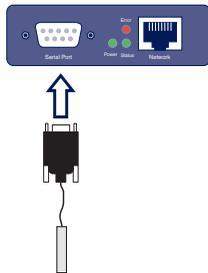
Just a few steps are required to start up your W&T Web-Graph 1x Thermometer and to make it visible in your network.

1.1 Connecting the power supply



Connect the AC adaptor provided to the terminal provided for the 12-24V AC/DC operating power. Polarity does not need to be observed.

1.2 Connecting the NTC sensor



Plug the sensor included in the scope of delivery into the 9-pin IO terminal on the unit.

1.3 Assigning the IP address using „WuTility“

Once the hardware has been connected to the power supply as described above, you must assign the IP address needed for operating in a TCP/IP network.



The IP address must be unique network-wide.

There are several ways to assign 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 below. A summary of alternative methods is contained in the appendix to this manual in Section 6.1.

Be sure that the PC you are using to assign the IP address is located in the same sub-net as the device and that both the PC and the device are connected to the network.

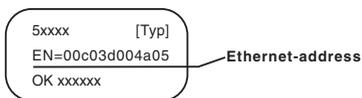
- Start „WuTility“ and click on the Scan icon:



- Using the MAC address, select your Ihr Web-Graph 1x Thermometer from the displayed list:

	Ethernet ID	IP address	Host name	Product ID	Model
	00c03d017822	0.0.0.0			Com-Server Highspeed

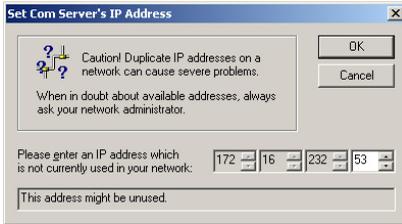
The MAC address can be found on this nameplate on the housing:



- Click on the „Assign IP Address“ icon:

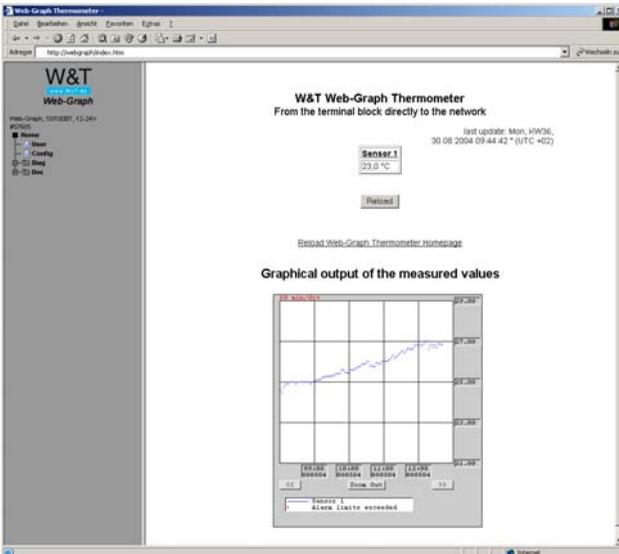


- In the window which opens enter the desired IP address for the device and confirm your entry with „OK“:



The device is given the assigned IP address. Clicking again on the Scan button displays this address in WuTility.

Clicking on the globe in the WuTility menu bar opens your standard browser, and you will see the start page of the device.

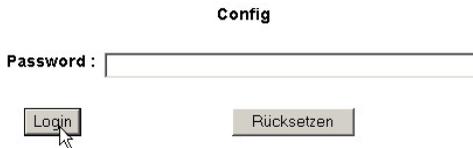


1.4 Assigning the basic network parameters

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

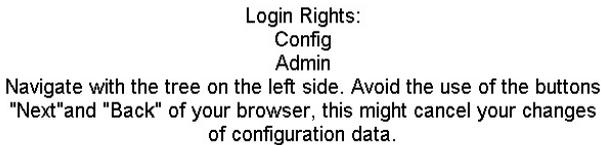


You are now prompted to enter a password. As shipped, the unit does not require a password, so that you can simply click on the Login button without entering a password.



[Back to Web-Graph Thermometer Homepage](#)

On the next screen use the profiles to select the configuration path.



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



Select the „Basic network parameter“ profile and click on the „Highlight 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:

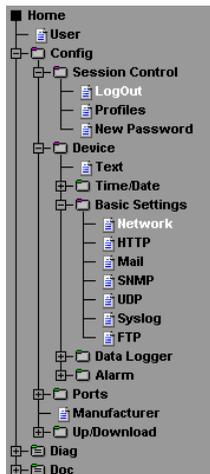
- Alarm via E-Mail
- SNMP incl. alarm via trap
- Alarm via TCP (client mode)
- Syslog messages incl. alarm
- Alarm via FTP (client mode)

Access from individual programs:

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



The device now automatically displays the necessary menu points for this profile. Click on „Network“ in the configuration menu.



In the following screen 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 or DHCP can only be used if the respective entry on the DHCP server assigns a reserved IP address. Important: If you are in doubt, check 'BOOTP disable'.
 BOOTP disable

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

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

Free memory: 49440 bytes

By then clicking on the „Save“ button, all your settings are saved in the device and you quit your configuration session. After the network parameters are changed, the unit automatically performs a restart.

Config >> Session Control >> LogOut

Save new configuration

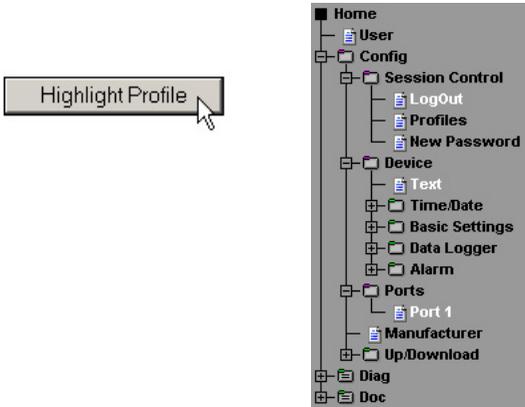
Exit without saving

Restore Factory Defaults

The device is now ready to operate in your network. For easy handling, use the additional profiles for adapting the device to your needs.

2 Additional basic settings

2.1 Configuring of port and device name



2.1.1 Text



Enter your personalized names and designations in the screen provided and then click on the „Temporary Storage“ button.

Config >> Device >> Text

Device Name : Name of device

Device Text : Description

(For a new line use
)

Location : Location of installation

Contact : Contact address

Free memory: 49421 bytes

2.1.2 Ports



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

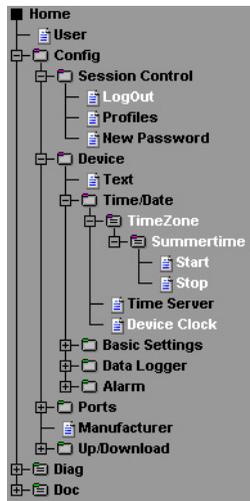
Config >> Ports >> Port 1

Name :

Text :
(For a new line use
)

Offset 1 :

2.2 Lokal clock settings



2.2.1 Time zone



Here is where you define the time zone where the device is located. The settings you make here are referenced to UTC (Coordinated Universal Time). Then click on the „Temporary Storage“ button.

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

UTCOffset : Offset to UTC
 :

Enable : Apply Time Zone

Free memory: 49421 bytes



2.2.2 Summer time



If you wish the device to automatically switch to summer time, first enter the offset to UTC. The standard value (for Germany) is two hours. Use „ „Apply summertime“ to activate this function and save the settings.

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

UTCOffset : Offset to UTC
 :

Enable : Apply Summertime

Free memory: 49421 bytes



Start/Stop



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

Start:

Last Sunday in March at 02:00 hours

Stop:

Last Sunday in October at 03:00 hours

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

Month : Summer time starts in

Mode : on

Weekday :

Time : :

Free memory: 49421 bytes



2.2.3 Device Clock



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

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

Time : :

Day :

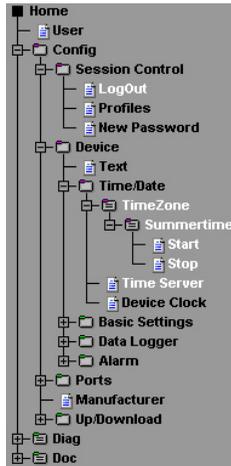
Month :

Year :

Free memory: 49421 bytes



2.3 Automatic clock settings with the network time service



2.3.1 Time Server



If you wish to have a time server adjust the time, enter the necessary information here.

The default addresses are only an example and do not 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).

europa.pool.ntp.org

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

0

Enable : Apply TimeServer

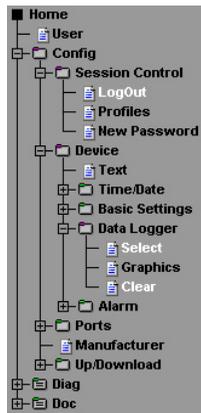
Free memory: 49421 bytes



If you enter a name as the address, be sure that you have first configured the gateway and DNS server so that the device can resolve the addresses.

Click on the "Logout" button and save your settings.

2.4 Configuration of the data logger



2.4.1 Select



Make the following settings:

Timebase: Defines at what time intervals the measured data are stored in the data logger. The device will in any case measure once a minute.

Select Sensor: The sensor selected here is used for saving the values in the data logger.

Config >> Device >> Data Logger >> Select

Timebase :

Select Sensor : Sensor 1

Graphics selection : Sensor 1

Color Sensor 1 : 

Memory size : 22 days, 18 hrs., 0 min.
Free memory: 49421 bytes

2.4.2 Clear



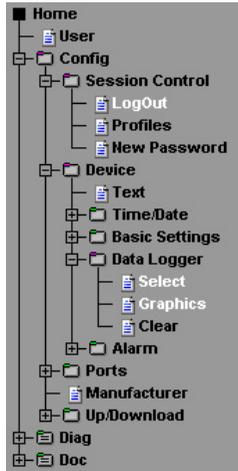
Clicking on the „Erase memory“ button deletes the entire contents of the data logger.

Config >> Device >> Data Logger >> Clear

Erase all flash data.

2.5 Configuration of the graphics display

Highlight Profile



2.5.1 Select



Config >> Device >> Data Logger >> Select

Timebase : 1 min

Select Sensor : Sensor 1

Graphics selection : Sensor 1

Color Sensor 1 : 0000FF

Memory size : 22 days, 18 hrs., 0 min.

Free memory: 49421 bytes

Temporary Storage Undo Logout

W&T

Graphics Selection: The selected sensor is shown in the graphics display.

Color Sensor X:



Defines the color curve of the sensor in the graphics display.

2.5.2 Graphics



Enter here the desired scaling for the displayed temperature curves:

Config >> Device >> Data Logger >> Graphics

Vertical auto scale : Auto scale enable

Vertical upper limit :

Vertical lower limit :

Horizontal zoom :

Free memory: 49440 bytes



Vertical Auto Scale: Activating this function sets the vertical scale using the minimum and maximum measured value. No other settings described below then have any effect.

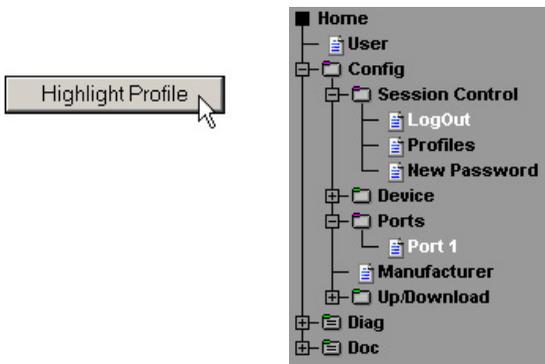
W&T

Vertical Upper Limit: Specifies the maximum displayed temperature

Vertical Lower Limit: Specifies the minimum displayed temperature

Horizontal Zoom: Specifies the time axis scale

2.6 Calibration



You can calibrate the sensor using single-point or two-point reference measurements and corresponding entry of offset values.

In single-point compensation the entered value is added to the measured temperature value, whereas two-point compensation calculates a straight line for compensating the entire measuring range. To remember calibration procedures, the user making the setting can add a comment.

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° Celsius.
All values in °C in the form xx.xx .	

Temperature 1 :

Offset 2 :

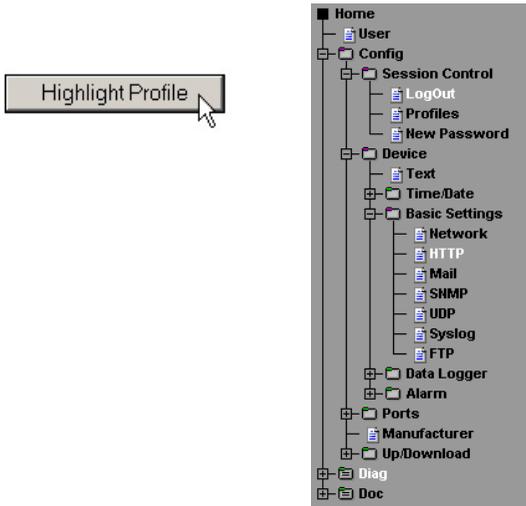
Temperature 2 :

Comment : Comments: date, name of operator, reference devices

Free memory: 49421 bytes

- Temporary Storage
- Undo
- Logout

2.7 HTTP access



2.7.1 HTTP



Startup: Specify here which HTML page you want to display when the device is started up.

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

HTTP Port : Default: Port 80

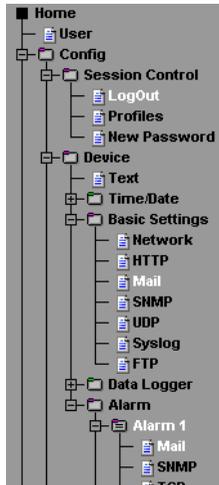
Free memory: 49421 bytes

W&T

HTTP Port: You can access the device through this port. The default is standard HTTP Port 80. If you want to use a different port, this may have to be explicitly named when the page is opened:

`http://webgraph:<PortNr>`

2.8 Alarm via E-Mail



2.8.1 Basic Settings -> Mail



Here is where you make the basic settings for e-mail sending of alarms.

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: 48205 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 at the e-mail recipient.

ReplyAddr: The reply address with which the device is identified

W&T

MailServer: In the next step set the IP address of your mail server and its host name (for configured DNS servers) which you want the device 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 a authentication for mail delivery is needed you can configure the user identification here:

SMTP authentication off: no authentication

ESMTP: a user-name and a password are needed to log in on the mail-server.

SMTP after POP3: for SMTP-sending a access to a POP3 server is necessary to identify the user. For this setting you also need to enter a valid POP3-server.

Enable: Be sure that the „Mail enable“ checkbox for sending e-mail is activated.

2.8.2 Alarm X



Here you configure the desired alarm conditions.

Config >> Device >> Alarm >> Alarm 1

Trigger : Sensor 1
 Timer
 Cold Start
 Warm Start
 Sensor lost

Min : Limit in °C (form: xx.xx).

Max : Limit in °C (form: xx.xx).

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

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

Interval : Sending interval in minutes

Enable : Mail enable
 SNMP Trap enable
 TCP Client enable
 Syslog Messages enable
 FTP Client enable

Free memory: 49003 bytes

Trigger: Here you define the trigger for the alarm e-mail. Multiple selections are possible.

To send a message without alarm status, activate the „Timer“ checkbox only.

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

Hysteresis: You can also specify a hysteresis value which is used to reset the alarm status.

W&T

Example:

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

When a limit is exceeded the alarm status is reset when 16°C (18-2) is reached or when the value falls below 12°C (10+2).

This function prevents the limit value from ,flickering‘.

Delay Time: The activation of the alarm will be delayed with this time (in min.) to compensate short limit offenses.

Interval: Enter here the send interval (in minutes) for sending a message when there is an active alarm. If you want to send just a single message, enter an „E“ here.

Enable: Select the type of message. FOR an e-mail alarm, check the „Mail enable“ box.

2.8.3 Alarm X -> Mail



The actual content of the e-mail is specified under this menu point.

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

E-Mail-Addr :

Subject :

Mailtext :

Options : Attach thermo.csv enable

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

Alarm Clear Text :

Free memory: 49421 bytes

E-Mail-Addr: Enter here the recipient’s e-mail address. To send the e-mail to multiple recipients, separate the addresses using a semicolon.

Subject: Specifies the subject line of the e-mail.

Mailtext: Here is where you enter the actual mail text. The following tags are also accepted in this text box:

- <T1> Displays the current temperature at this point.
- <Z> Displays the current date and time of day.

Attach thermo.csv enable: The „Attach thermo.csv enable“ option allows you to attach the complete contents of the data logger in semicolon-separated CVS format to the e-mail. The time base of the output corresponds to the data logger settings.

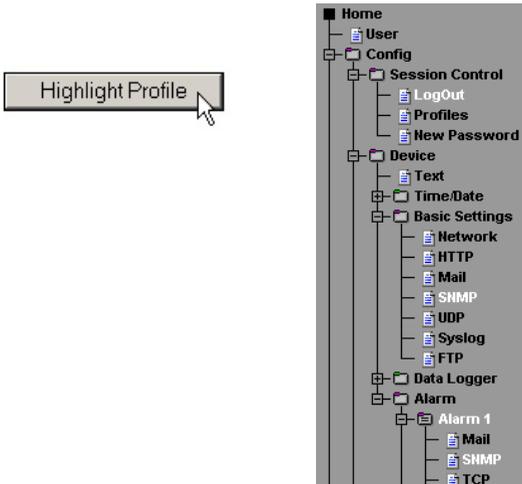


The file is generated dynamically in the device, so that when the logger content is large creation of the CSV file may take up to 30 seconds. During this time no other e-mail can be sent. Pending alarms are send directly after the mail with attachment is sent.

W&T

Alarm Clear Text: An Alarm Clear message is also sent when the temperature rises or drops to the valid range. Here you can use the same tags as for the alarm message.

2.9 SNMP incl. alarm via trap



Send alarm messages as an SNMP trap.

2.9.1 Basic Settings -> SNMP



Here you define the basic settings needed for SNMP operation.

W&T

Community String: Read: By using this string you can access temperature values in read mode in your SNMP manager.

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

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

System Traps: You can create two system traps.

Cold Start: When power fails or is disconnected

Warm Start: For device reset

SNMP Enable: Check this box to activate SNMP functionality.

Config >> Device >> Basic Settings >> SNMP

Community string: Read :

Community string: Read-Write :

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

System Traps : Cold Start
 Warm Start

Enable : SNMP enable

Free memory: 49421 bytes

2.9.2 Alarm X -> SNMP



The actual content of the SNMP trap is set under this menu point.

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: 49421 bytes



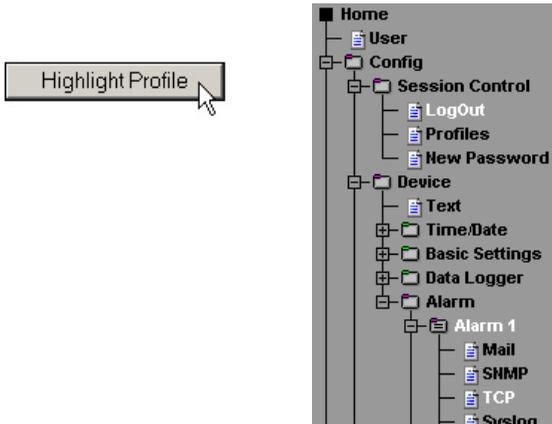
Manager IP: Contains the IP address of your SNMP manager. The device sends the SNMP messages to this address.

Trap Text: Here is where you enter the actual trap text. The following tags are also accepted in this text box:

- <T1> Displays the current temperature at this point.
- <Z> Displays the current date and time of day.

Alarm Clear Text: An Alarm Clear message is also sent when the temperature rises or drops to the valid range. Here you can use the same tags as for the alarm message.

2.10 Alarm via TCP (client mode)



Send the alarm messages as a TCP packet.

2.10.1 Alarm X -> TCP:



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

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

TCP Text: The text corresponds to the same specifications which 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)

192.168.4.56

Port : 8000

TCP Text : Temperature too high! <T1>°C

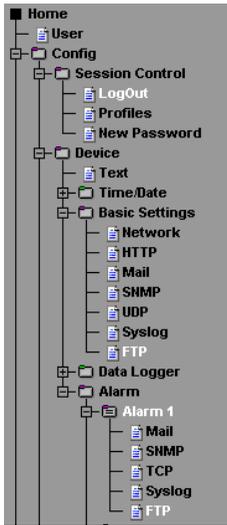
Alarm Clear Text : This messages will be send if alarm state is cleared.
Temperature OK! <T1>°C

Free memory: 49421 bytes

Temporary Storage Undo Logout

2.11 Sending alarms via FTP (Client Mode)

Highlight Profile



Write temperature values directly to an FTP server.

2.11.1 Basic Settings -> FTP



Here you will find the basic settings needed for FTP mode

FTP Server IP: Enter here the IP address or the 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 access is 21. This port is already preset and should function on most systems at the first go. If you require a different port, please consult your network administrator.

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

Password: This is the password assigned to the user.

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

Options / PASV: If this option is enabled, the server is instructed to operate in passive mode. This means the data connection is opened by the Web-Thermograph. If this option is disabled, the FTP server takes over opening of the data connection. If the server is protected by a firewall, it is recommended that the PASV option be enabled, since otherwise connection attempts could be blocked.

Enable: To use the 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: 49003 bytes

Temporary Storage 

Undo

Logout

2.11.2 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 which the device should access.

FTP Alarm Text: Here you define the content of the file. The following tags may be used::

<T1> displays the current temperature at this location.

<Z> displays the current time of day and date.

If you want a line break after each data transmission, enter a CRLF by prssing the RETURN key at the end of the line.

W&T

Alarm Clear Text: This message is sent after the alarm state is ended. The same tags as described above may be used.

Options:

STORE: Creates a file and writes 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.

File Name :

FTP Alarm Text :

Alarm Clear Text :

This messages will be send if alarm state is cleared.

Options :

STORE

APPEND

Free memory: 49003 bytes

W&T

2.12 Sending alarms via Syslog



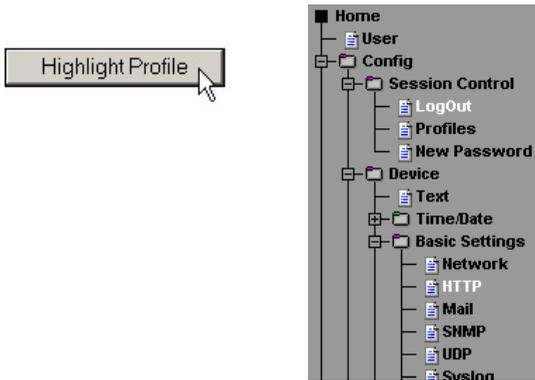
IP Addr: The IP address to which you want to send the message.

Port: The recipient must have a Syslog server service on this port which can pick up incoming connections (standard: 514)

Syslog Text: The text corresponds to the same specifications which apply to the other message types.

Alarm Clear Text: see above

2.13 ASCII command strings via TCP Port 80



2.13.1 HTTP



When queried by means of an HTTP-Get command, the device can also send a header with IP address and device name in addition to the temperature. To do this, check the appropriate box. Only the temperature is sent if this function is deactivated.

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.

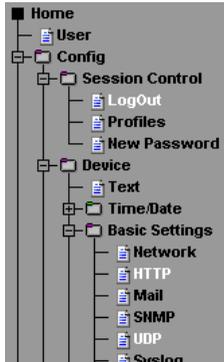
index.htm
 home.htm
 user.htm

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

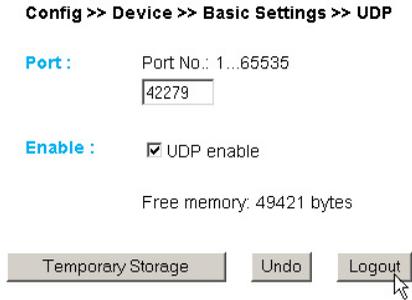
HTTP Port : Default, Port 80

Free memory: 49421 bytes

2.14 ASCII command strings via UDP

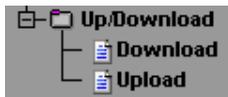


In addition to TCP/IP comands, the device can also reply to UDP datagrams. For this you must set the port you want the device to „listen“ to. The default setting is 42279. The enable function activates UDP.



The setting of the header which can be appended to the temperature in messages applies here as well.

2.15 UP-/Download



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

With **XML-Download** you can read out the settings of the Web-Graph Thermometer and make any modifications, and **XML Upload** allows you to store the settings again in the device.

 *With some Web browsers the correct code is only output using the path „View-> Display (Frame-) Source text“ after the „XML Download“ button has been clicked.*

For XML upload you create or modify a text file with the corresponding parameters and load this file into the device. The configuration of the 8x Thermometer must begin with the expression

```
<io-AN1.3>
```

and end with the expression

```
</io-AN1.3>
```

The sequence of the parameters you set corresponds to the sequence of the configuration menu starting at „Device“.

The syntax for configuring via XML is as follows:

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

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



Please note, especially in the case of mass updates and configurations, that the IP address stored in the XML file is also sent, which only needs has to be adapted.

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

An example can be found in the Appendix (6.2).

Use the menu point „**Upload** -> **GIF**“ to replace the logo displayed in the menu and store it directly in the device.

3 Single querying of temperatures

3.1 Querying temperature via TCP/IP

It is possible to use a socket connection to manually query the current temperature values in CSV (comma-delineated data).

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

```
GET /Thermo.csv
```

To query the individual, current temperature value, send the string:

```
GET /Single1
```

3.2 Temperature querying via UDP

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

Then send the device one of the expressions given under 3.1 and the device will return the temperature to the port you are using.



When using multiple devices, it may be practical for broadcast transmissions to include the name and IP address of the device as well. To do this, activate „GET Header enable“ under „Config >> Device >> Basic Settings >> HTTP“.

3.3 Temperature querying using SNMP

The sensor can be queried directly using SNMP-Get requests. They reach the sensor via the following path:

`<IP-address> 1.3.6.1.4.1.5040.1.2.8.1.3.1.1.1`

`<IP-address> 1.3.6.1.4.1.5040.1.2.8.1.4.1.1.1` = Temperature value as a 3-digit integer value, without comma delineation.



For querying, specify the configured SNMP Read or Read/Write community.

An MIB for incorporation into management applications can be downloaded from the data sheet page for the device at the WuT homepage <http://www.wut.de>.

To change the settings in the device using SNMP (IP address, subnet mask, etc.), you must first use your SNMP manager to start a session on the device.

 *If you have assigned an administrator password, you must enter it in your manager software as a „community string“!*

Entering the administrator password in the variable

```
wtWebioAN1graphSessCntrlPassword
```

opens a session. By reading out the variable

```
wtWebioAN1graphSessCntrlConfigMode
```

you can check whether the session was successfully opened.

1 = Session opened, device in configuration mode.

0 = Opening of the session failed. Check whether you entered the password incorrectly.

After successfully opening the session, you can use the variables defined in the private MIB to make any configuration changes.

Once you have finished with configuration, write the variable

```
wtWebioAN1graphSessCntrlLogout
```

to close the session.

```
wtWebioAN1graphSessCntrlLogout =
```

1 All changes are saved

2 Quit without saving

If no SNMP communication takes place over a period of 5 minutes during an open session, the device unilaterally ends 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.

4 Adding the temperature into your own web page

It is possible to use an implemented Java applet to integrate the temperature on your own Web page. The applet is refreshed every 60s. An example for this applet is already contained in the device:

`http://172.0.0.10/app.htm`

To incorporate the applet for temperature monitoring into the HTML page, the following HTML tag must be inserted at the location where the applet is incorporated:

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

Now you can optionally specify the following parameters:

Background color:

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

Font color:

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



The RGB value is specified 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

This specification is not case sensitive.

If a parameter is omitted or incorrectly set, the following default values are used:

BGColor	#FFFFFF (weiß)
FGColor	#000000 (schwarz)
Align	Right

The sensor is selected using the parameter

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

When all the parameters are specified, the HTML tag must be finished with `</Applet>` .

Example:

```
<Applet Archive="A.jar" CODE="A.class"  
Codebase="http://127.0.0.1" Width="300" Height="100">  
<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 determined by the size of the applet.

5 Data logger

The Web-Thermograph stores all the measured values in a non-volatile ring memory, so that they are retained even after loss of power or actuating the reset button.



The measured data in the data logger are recalled through the user page of the device (Home -> User or <http://xxx.xxx.xxx.xxx/user.htm>).

Under *Config -> Device -> Data Logger -> Memory* you can clear the memory.

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

14.10.2003	Di	08:47	23,1
14.10.2003	Di	08:46	23,1
14.10.2003	Di	08:45	23,0
01.01.2002	Di	12:08	23,0
01.01.2002	Di	12:07	23,0
01.01.2002	Di	12:06	22,9
01.01.2002	Di	12:05	22,9
01.01.2002	Tu	12:04	22,0

time line interruption:
yellow marked line



When alarm limit values are set, temperatures which are not within the valid range are highlighted in red.

6 Appendix

6.1 Alternate methods of IP address assignment

6.1.1 Using DHCP-/BOOTP protocol

Many network use DHCP (Dynamic Host Configuration Protocol) or BOOTP. for centralized and dynamic assignment of IP addresses. Which of the two protocols is used in a given situation makes no difference as far as the Web-Graph devices are concerned, since DHCP is simply an upward compatible expansion of BOOTP. DHCP servers therefore also use requests from BOOTP clients.

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

- IP-Address
- Subnet-Mask
- Gateway-Address

It is not possible to assign other parameters or lease time.

Functionality

To obtain an IP address, the device sends a corresponding BOOTP request as a broadcast to the network after each new start. The reply then generated by the DHCP/BOOTP server contains not just the IP address, but also the subnet mask and gateway address. The Web-Thermograph immediately stores this information in its non-volatile memory.

Please consult with the responsible systems administrator when starting up the device in DHCP/BOOT networks. If you are using DHCP to assign addresses, you must also indicate that a reserved IP address is required. To update the respective address database, the systems administrator needs the Ethernet address of the Web-Graph Thermometer, which can be found on the nameplate attached to the housing.

Once the necessary entries have been made, the device automatically retrieves the desired IP address after every reset. To ensure availability of the Web-Thermograph even if the DHCP/BOOTP server fails, the previous IP address is used if no reply is forthcoming.



In DHCP environments the IP address you want to assign must be reserved by means of a fixed-connection to the Ethernet address of the Web-Thermograph. Under Windows NT this is done in the DHCP manager under the menu point „Reservations“. Linux makes available the file „dhcpd.conf“ available for this purpose, in which you must make a corresponding entry.

6.1.2 ...Using ARP command

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

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

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 non-volatile memory.



This method can only be used if no IP address has as yet been assigned to the Web-Thermograph, in other words the entry is 0.0.0.0. To change an already existing IP address, you must open the configuration menu from your browser or use the serial method (see below).

6.1.3 ...Using a serial interface

In contrast to the procedure described above, you can use the serial port to change an already existing IP address for the Web-Thermographs.

Connect the RS232 port on the device to a PC (null modem cable, with the Web-Thermograph only pins 2, 3 and 5 are allowed to be connected) and start a terminal program (e.g., Hyperterminal). Establish a direct connection in the program through your COM port and set the serial properties to *9600 baud, no parity, 8 bits, 1 stop bit, no protocol*. Force a reset by interrupting power while holding down the „x“ key until the reply „*IPno.+<Enter>*“ appears. Enter the IP address using conventional notation (xxx.xxx.xxx.xxx) and finish the entry with <Enter>. You can also enter the subnet mask and gateway and turn the BOOTP client off directly by using the following syntax after the entry prompt (*IPno.+<Enter>*):

```
<IP-Adresse>, <subnetmask>, <gateway>-0
```

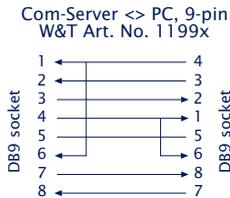
! If you make a typing error when entering, the text cannot be corrected using the Backspace key. The procedure must be repeated.

If the entry was correct, this is acknowledged by the assigned parameters, otherwise the monitor displays the current IP address together with the message „Fail“. This procedure may be repeated as often as desired.

To turn off the BOOTP (DHCP) functionality directly, enter the expression „0“ directly following the parameters (e.g. 192.168.1.2-0)

xxx	->Web-Graph Thermometer
IP no. +<ENTER>:	<- Web-Graph Thermometer
172.17.231.99,255.255.255.0,172.17.231.1-0	-> Web-Graph Thermometer
172.17.231.99,255.255.255.0,172.17.231.1-0	<- Web-Graph Thermometer

To connect to a terminal, you will need a null modem cable:



For the Web-Thermograph only pins 2, 3 and 5 are allowed to be connected.

6.1.4 ...Using an 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 expand `/etc/ethers` by one line with the assignment of the Ethernet address of the Web-Thermograph to the desired IP address. In `/etc/hosts` the link with an alias is then specified. After you have connected the device in the network segment of the RARP server, you can assign the desired IP address to the device over the network.

Example:

Your Web-Thermograph has MAC address EN=00C03D0012FF (sticker on the housing). You want it to have IP-Address 172.0.0.10 and the alias WT_1 .

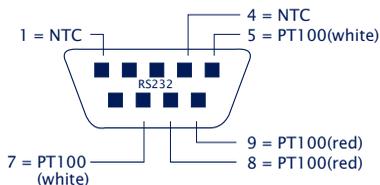
Entry in the file `/etc/hosts`: 172.0.0.10 WT_1

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`“.

6.2 Connecting PT100 sensors

To connect a PT100 sensor, use the following pin configuration:



6.2 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 let you insert tags into the page. The following shows an example for creating the „user.htm“ page.

Create an HTML file which must begin with the expression

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

Then enter the HTML code.

You can display the following parameters on your pages:

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

Displays the current temperature

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

Inserts the current time of day.

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

Inserts a list box for selecting the times 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 a hidden session control so that the use is not logged out of the device when leaving the page. The expression is only needed if you want to design your own button for sending. In that case insert this expression between *<form action>* and *</form>* ein.

W&T

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

Inserts the name of Sensor 1 in the page and contains a link to the full sensor description.

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

Inserts the assigned device name.

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

Inserts the freely configurable descriptive text for the device.

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

Inserts a „Reload“ button which reloads the current page.

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

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

Inserts a button for moving forward or backward in the measurement table.



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

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

Inserts a table with the current temperature values. This table can be navigated only on the „log-page“ using the „Next“ and „Previous“ buttons (see above). Only the current temperature values can be displayed on the two other pages (user.htm and home.htm).

```
<w&t_tags=bc1>
```

Describes a background color (BGColor) which varies with the alarm status of the sensor. If there is a limit violation, this color is red. Otherwise the tag does not describe an explicit color. This tag is needed for example to show limit violations in red in the log table.

Example for setting a background color in a table:

```
<tr>
```

```
  <td colspan="3" align="center">
```

W&T

```
<table border="2">
  <tr>
    <th><w&t_tags=sensor1></th>
  </tr>
  <tr>
    <td <w&t_tags=bcl><w&t_tags=t1> &deg;C</td>
  </tr>
</table></td>
</tr>
```

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

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

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

You can specify CSV output by using the expression

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



Resetting the device to its factory default values restores the original HTML pages.

W&T

Sample user.htm:

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

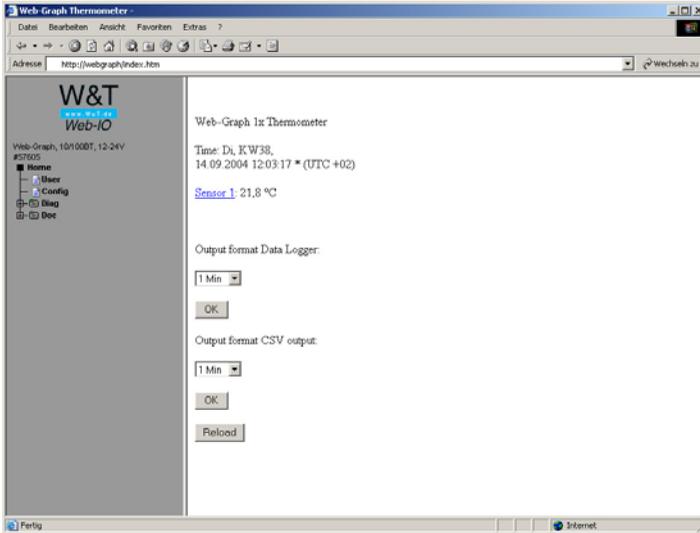
<body bgcolor="#FFFFFF" text="#000000">
<p>Web-Thermograph</p>
<p>Time: <w&t_tags=time></p>
<p><w&t_tags=sensor1>: <w&t_tags=t1> °C</p>
<p>&nbsp;</p>

<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:



W&T

Sample log.htm:

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

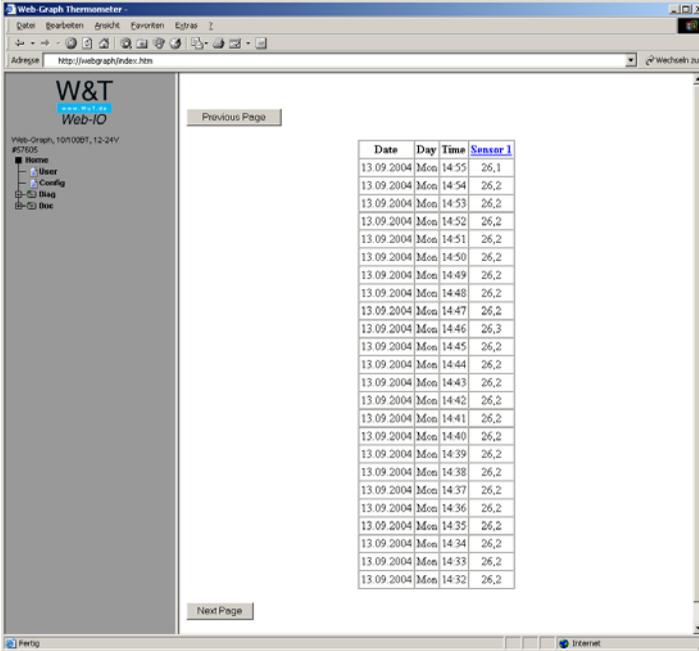
<body bgcolor="#FFFFFF" text="#000000">

<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:



6.3 Extending the NTC cable

The cable on the NTC sensor can be extended if needed. A normal Cat. 5 cable is recommended for this. To avoid falsifying the measurement, you must ensure that the cable resistance is not greater than 100ohms.

Given a copper cable with a cross-section of 0.75²mm and a length of 100m, the cable resistance will be 4,60ohms and within the tolerance range.

When using a copper cable, verify the cable resistance using the following formula:

$$R_L = \frac{2 \cdot \text{length [m]}}{58 \cdot \text{cross section [mm}^2\text{]}}$$

The result of this calculation should be less than 100ohms. Even more problematic than the cable length are the noise influences on the cable. Noise from the outside can induce measuring errors. Therefore you should make sure that the cable is routed such that it is well isolated from other installations and thus subjected to as little noise as possible.



The accuracy and error resistance of the sensors are a function of the cable length and any ambient noise effects. In some installations, local conditions may be such that some measuring errors or inaccuracies cannot be completely excluded. If this is a new installation, we recommend using a 4-conductor cable right from the outset to allow for later use of the PT100 instead should noise problems persist with the NTC sensor.

We have taken various steps to ensure that known noise sources such as the 50Hz harmonics on the high-voltage cable do not have an effect on the measurement values. You can easily verify how well our noise suppression measures function in your own environment by using fixed resistors in place of the NTC sensors. The measurement values should in this case fluctuate by no more than one decimal place.

6.4 Firmware Update

The Web-Thermographs firmware is under continuous development. The following section describes the procedure for uploading new firmware as it becomes available.

- Where to I obtain the current firmware?
- Firmware update over the network using Windows

6.4.1 Where do I obtain the current firmware?

The most up-to-date firmware including the necessary update tools and a revision history are published on our Web pages under the following address: <http://www.wut.de>

Before downloading, write down the 50digit type number for the Web-Thermograph found on the part label. From the homepage you go to the product overview, which is sorted by article number and from which you can get directly to the data sheet for your unit. From there follow the link to the current firmware version.

6.4.2 Firmware-Update over the network using Windows

The prerequisite is a PC running under Windows 9x/NT/2000/XP with a network connection and activated TCP/IP stack. For the update process you will need twofiles whyich, as already

described, can be downloaded from the homepage <http://www.wut.de>.

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

No special preparation of the Web-Thermographs is necessary to perform the firmware update.

The *WuTility* used for the update detects all the WuT devices in your network and is essentially self-explanatory. If you do have any questions or if anything is unclear, please use the associated documentation or our online help.



Never intentionally interrupt the update process by disconnecting the supply voltage or pressing the Reset button. After an incomplete update the Web-Graph Thermometer will be incapable of functioning.

Never mix files having different version numbers in the file name. This will result in malfunction of the device.

The Web-Thermograph automatically recognizes when transmission of the new firmware is complete and automatically performs a reset.

6.4.3 LED indicators

- **Power-LED:** Indicates presence of supply voltage. If the LED does not come on, please check that the power supply is properly connected.
- **Status-LED:** Flashes whenever there is network activity of the Web-Thermometer. Periodic flashing indicates that the unit is ready.
- **Error-LED:** The Error LED uses various flash codes to indicate error conditions on the device or network port.

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

2x bzw. 3x flashing of the Error-LED = Perform a reset by interrupting power. If the error cannot be cleared, reset the device to its factory defaults. Since this resets all network settings, you should first write down the existing network settings.

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

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

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

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

Auxiliary LEDs (internal)

- **on error http://xxx.xxx.xxx.xxx/diag -LED:** Indicates internal configuration errors. For troubleshooting, please open the page <http://xxx.xxx.xxx.xxx/diag> in the device.
- **system error:** Serious hardware error. Attempt to start the device up again by interrupting supply voltage. If the condition persists, please return the unit for inspection.



If the Web-Graph Thermometer has no IP address or Address 0.0.0.0, the on error and system error LEDs remain on! The system error LED flashes 3x after a brief time. The LEDs do not turn off until an IP address has been assigned.



6.5 Emergency access

The serial connection (DTE) of the device provides emergency access. This is activated as follows:

Use a serial cable (null modem cable: pins 2, 3 5 only) to connect the unit to a PC and start a serial terminal program. Make the program settings as follows:

9600,8,N,1,no handshake

Disconnect the supply voltage. Press the following letters on your keyboard 3 times for the respective access:

3x „u“ Opens the update port. You can now load a firmware update.

3x „f“ Resets the device to the factory defaults. All previous configuration settings (including IP address) are lost.

3x „p“ Deletes all assigned passwords.

For confirmation the **system error** and the **on error http** LEDs flash several times one after the other.

3x „x“ (Directly after pressing the Reset button, before the audible tone). Used for assigning/changing the IP address. When prompted, enter the desired IP address.

6.6 Technical Data

Prod. No.:	#57605
Sensors:	NTC and PT100 connection
Network:	10/100BaseT autosensing
Power Supply:	12-24V AC / DC via terminal screw
Measurement unit:	
Sensor:	NTC 10k, PT100 connection, 2-, 3- or 4-wire
Measuring range:	-45°C...75°C(NTC), 105°C(PT100)
Resolution:	1/10 °C
Measuring error:	±0,3°C, ±5% (NTC) ±0,3°C, ±2% (PT100)
Saving frequency:	1, 5, 15, 60 min
Memory (832kB):	min. 14 weeks, max. 16 years
Additional infos:	
Galvanic isolation:	Inputs vs. Network: min. 500 Volt
Mail function:	Mail for sending alarm or reports
Power supply:	DC 12V (-5%) - 34V (+5%) AC 9Veff (-5%) - 24Veff (+5%)
Current consumption:	AVG: 310mA @3.3V, Max: 400mA @3.3V
Emergency entry:	Serial port RS232, 9600 baud, 8 databit, 1 stopbit, no parity
Housing:	Plastic housing, 105 x 75 x 22 (l x b x h)
Weight:	approx. 200g
Storage temperature:	-40...+70°C
Operating ambient temperature:	non-cascaded: 0 ... +60°C cascaded: 0 ... 50°C

6.7 Declaration of Conformity



Declaration of conformity according to paragraph 10.1 of directive 89/336/EWG

Wiesemann & Theis GmbH hereby confirms that the products

Web-IO 1x Thermometer	Typ 57601
Web-IO 2x Thermometer	Typ 57603
Web-IO 8x Thermometer	Typ 57604
Web-Thermograph	Typ 57605
Web-Thermo-Hygrograph	Typ 57606

fulfill the requirements of the directives / regulations specified below:

- 1. Emission according to
 - 1.1. EN 55022-B (1997)
 - 1.2. EN 61000-3-2 (1996)
 - 1.3. EN 61000-3-3 (1996)
- 2. Noise Immunity according to EN 61000-6-2 (1999):
 - 2.1. EN 61000-4-2 ESD
 - 2.2. EN 61000-4-3 Radiated Immunity
 - 2.3. EN 61000-4-4 Burst
 - 2.4. EN 61000-4-5 Surge
 - 2.5. EN 61000-4-6 Conducted Immunity
 - 2.6. EN 61000-4-8 H-Field
 - 2.7. EN 61000-4-11 Supply Voltage Dips and Interruptions
- 3. Product-specific Low-Voltage Directive for communications technology
 - 3.1. EN 60950 (1997)

Wuppertal, 02/10/2005



Klaus Meyer



Dipl.-Ing. Rüdiger Theis, Managing Director

Interfaces
für
Netzwerke



serielle
Schritt-
stellen



und
Drucker-
schritt-
stellen

