Appendix for P85xx manual

Content

1 Web pages design

P85xx transducers enable to design user's own web pages to display readings from the transducer. To successfully make of user's web pages you need this files: **web2cob.exe**, **mimetype.ini**, **jsgraphics1.js**. Contact manufacturer for obtaining this files. To upload web files to probe is the tftp client needed (included in Windows XP).

Pages are created in html code, web server detects command GET. Six 64 kB banks WEB1-6 are available for www pages of the transducer.

Address of www pages is **http://IP__transducer/page.html**. If your home page is named **index.html**, enter only IP of the transducer.

1.1 P85xx tags

Create HTML pages in any editor. Enter proper tag from tables to place where any of desired transducer reading is required.

1.1.1 Basic tags

Tag	Description
<%srn%>	Serial number of transducer.
<%name%>	Name of transducer.
<%rfr%>	WWW pages refresh interval (s).
<%fw%>	Firmware version of the transducer.
<%ttbl%>	Create a table with times of saving values to history table.
<%time%>	Write time. If the time isn't synchronized with SNTP server, time will be generated using JavaScript and in front of the time will be the text Local PC time written.
<%hdly%>	History storage time (s).

1.1.2 Tags for temperature channels

Tag	Description
<%c1%>	Current temperature on channel 1
<%c1n%>	Channel 1 name
<%gc1%>	Channel 1 temperature graph (history 1 – 300) – requires file **jsgraphics1.js**!
<%gc12%>	Channel 1 temperature graph (history 301 – 600) – requires file **jsgraphics1.js**!
<%ac1%>	Channel 1 status
<%hc1%>	Upper limit
<%lc1%>	Lower limit
<%hsc1%>	Hysteresis
<%dc1%>	Time delay
<%tc1%>	Temperature table
<%rom1%>	ROM code for temperature probe
<%unt1%>	Write the channel physical unit.

For channel 2-4 are the same tags, change only number of channel. ie: <%lc4%> write lower limit for channel 4.

1.2 Example

1.2.1 HTML code example

```html
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>
  <head>
    <meta http-equiv="refresh" content="<%rfr%>">
    <meta http-equiv="content-type" content="text/html; charset=windows-1250">
    <style>
    <!--
      body{ font-family: verdana, arial, helvetica, sans-serif; font-size:76%;
            color: #000; background-color: #fff; }
      h1{ font-size: 2.0em; font-weight: normal;margin-top: 0.5em;
          margin-bottom: 0.2em; }
      .cervene{ color: red }
      .modre{ color: #0000FF }
    //-->
    </style>
    <script src="jsgraphics1.js"></script>
  </head>
  <body>
    <h1>
      Current temperature: <%c1n%>
      <%unt1%>
    </h1>
    (<%time%>)
    <h1>Temperature history:</h1>
    <%unt1%>
    <div style="position:absolute;top:120px;left:30px;">
      <%gc1%>
    </div>

    <div style="position:absolute;top:280px;">
    <h1>Temperature settings:</h1>
    <table>
      <tr>
        <td>Alarm:</td>
        <td><%ac1%></td>
      </tr>
      <tr>
        <td>upper limit:</td><td class="cervene"><%hc1%>
          <%unt1%></td>
      </tr>
      <tr>
        <td>lower limit:</td><td class="modre"><%lc1%>
          <%unt1%></td>
      </tr>
      <tr>
        <td>hysteresis:</td><td><%hsc1%>
          <%unt1%></td>
      </tr>
      <tr>
        <td>time delay:</td><td><%dc1%> s</td>
      </tr>
      <tr>
        <td>Storage interval:</td><td><%hdly%> s</td>
      </tr>
    </table>
    </div>
  </body>
</html>
```
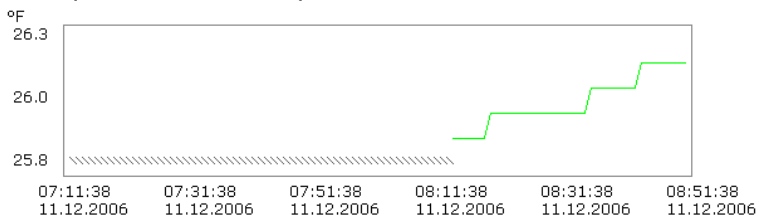
1.2.2 Generated web page

Current temperature: 26.2 °F
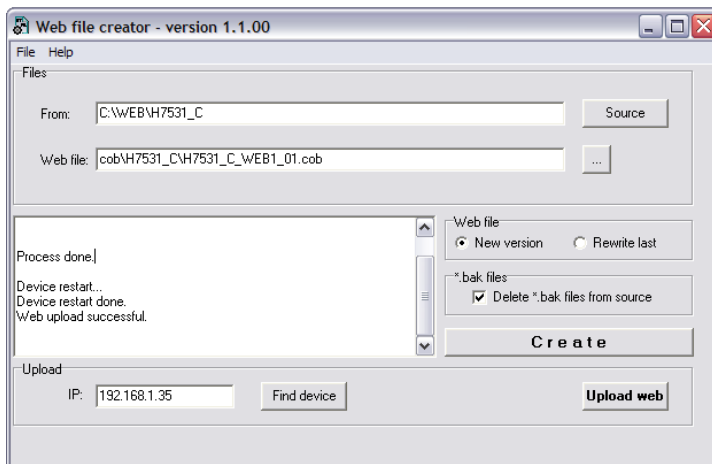(11.12.2006 08:50:51)

Temperature history:

Temperature settings:

Alarm: no
upper limit: 300.0 °F
lower limit: -200.0 °F
hysteresis: 1.0 °F
time delay: 30 s
Storage interval: 60 s

1.3 Web compilation and pages upload

For upload web pages to the device, use WebFileCreator software. This software is available on the manufactures web pages. Save pages intended to be uploaded to the device to one directory (best way is create subdirectory at WebFileCreator's directory). In case history graph is required to display, it is necessary to add file `jsgraphics1.js` to the directory with www pages. For the correct function of a SOAP messages sending is the **`soap`** file required (eventually **`soap.conf`** file).

Web pages upload process:
1. Unpack file `www.zip` to a directory **`C:\WEB`**
2. New web pages copy to a WebCreatr's subdirectory (e.g. **`C:\WEB\P8541_C`**)
3. Run software **`C:\WEB\WebFileCreator.exe`**

4. Insert path to the new web pages to a `From` field (**`C:\WEB\P8541_C`**)
5. Press `Create` button. Now software compile web pages to a `cob` file.
6. Insert device IP address (field `IP` or use button `Find device`). Then press `Upload web` button. Software now uploads new web pages to your device. This will take approx. 30 sec. For web upload is necessary opened UDP port 69 for TFTP data transfer.

1.4 Supplement

1.4.1 Reserved file names

Device web server has some reserved file names (this names aren't for free use).

File name	Descriptions
`index.html`	Main web page. If you insert only IP address this file is shown.
`soap`	SOAP file. If a SOAP message is sended, this file is processed. This file is for SOAP protocol mandatory.
`soap.conf`	Configuration file for HTTP SOAPaction header.
`jsgraphics1.js`	Javascript file is necessary for history graphs.
`export.csv`	Virtual files for export history to a CSV files.
`export_comma.csv`	

1.4.2 Restrictions

- Every `<% %>` tag must be placed in new line in source code.
- Respect reserved file names.
- For history graphs is `jsgraphics1.js` file necessary.
- Maximal size of one HTML file is 64kB.
- Maximal size of web pages is 256kB (summary of all files)
- Capacity of device web server is limited. The larger size of www pages, the lower number of simultaneous accesses is enabled. Small web pages without many graphics and images are recommended. Using frames is not recommended. For text and graphic use css inside HTML file.

2 SOAP protocol

SOAP serves for sending measured data to a HTTP server. With the aid of this protocol data are sent as a XML document (SOAP message). The advantage of this protocol is that sent data aren't binary and for this reason SOAP messages are allowed through firewalls.

2.1 Example of SOAP message sent from the P85xx transducer

```xml
<?xml version="1.0" encoding="utf-8"?>
  <soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
                 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                 xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <soap:Body>
    <InsertP85xxSample xmlns="http://cometsystem.cz/schemas/soapP85xx_v2.xsd">
      <passKey>07940141</passKey>
      <device>4352</device>
      <temp1>23.1</temp1>
      <temp2>23.1</temp2>
      <temp3>22.8</temp3>
      <temp4>22.9</temp4>
      <alarms>lo,no,hi,hi</alarms>
      <tempU>C</tempU>
      <timer>10</timer>
    </InsertP85xxSample>
  </soap:Body>
</soap:Envelope>
```

Element	Description
`<soap:Envelope>`	Specifies that the XML document is a SOAP message. It is defined by the SOAP protocol.
`<soap:Body>`	Everything what is nested in this element are SOAP message data. It is defined by the SOAP protocol.
`<InsertP85xxSample>`	It is needed to have running HTTP server for accepting SOAP messages. For example it can be Microsoft Internet Information Service or Apache HTTP server. There have to be installed a web service for processing data from the message on this server. For example ASP.NET or PHP can be used for creating the web service. This service must include a method of the same name as this element (thus **InsertP85xxSample**). Descendants of the element Ins (nested elements **passKey**, **device**…) must correspond to parameters of the method. The attribute xmlns defines a namespace for elements of the SOAP message. For namespace name was chosen the URI referring to the XSD schema which describes this SOAP message. This schema only defines the structure of the XML document which represents the SOAP message. It is in no manner related to the sending and accepting functionality.

		Description
	`<passKey>`	Contains the transducer serial number (an eight digit whole number).
	`<device>`	Device type identification number (code).

Device	Code [DEC]	Code [HEX]
P8511	4352	0x1100
P8541	4353	0x1101
P8510	4354	0x1102

		Description
	`<tempX>`	Contains the value of temperature (a number whose decimal part is separated by a dot). In case of probe failure it can contain this value: **9999 (-9999)**.
	`<alarms>`	Temperature channels alarm state. Alarm states: **no** no alarm or channel is disabled **hi** upper limit alarm **lo** lower limit alarm
	`<tempU>`	Temperature unit (and dew point). Values: **C** – temperature unit is °C. **F** – temperature unit is °F.
	`<timer>`	SOAP sending interval (sec).

2.2 Modification of the structure of the SOAP message

It is possible to write your own XML document which represents the SOAP message. You can create it in whatever text editor. Enter proper tag according to tables below to the place where you want to insert any of data field provided by the transducer. Finally save the file with the name `soap` and add it to the directory with web pages. Its upload to the transducer is part of web pages upload.

Tag	Description	Example	Stand.
`<%srn%>`	Serial number of the device.	`07940140`	✓
`<%time%>`	Writes a time. It is either synchronized with a SNTP server (format: `dd.mm.yyyy hh:mm:ss`) or simply a number of seconds elapsed from enabling the device (format: `Local: <NumberOfSeconds> /1000`)	`30.10.2008 11:38:45`	
`<%type%>`	Device type.	`P8511`	
`<%kind%>`	Device type identification number.	`4352`	✓
`<%tmr%>`	SOAP sending interval (sec).	`30`	✓
`<%ala%>`	Temperature alarm status.	`no,no,lo,hi`	✓
`<%c1%>`	Actual channel 1 temperature.	`35.8`	✓
`<%c2%>`	Actual channel 2 temperature.	`31.0`	✓
`<%c3%>`	Actual channel 3 temperature.	`-5.1`	✓
`<%c4%>`	Actual channel 4 temperature.	`28.0`	✓
`<%c1u%>`	Temperature unit.	`C`	✓

Simple XML file example (information about channel 1 temperature):

```xml
<?xml version="1.0" encoding="utf-8"?>
  <soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
                 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                 xmlns:xsd="http://www.w3.org/2001/XMLSchema">
   <soap:Body>
     <InsertP85xxSample xmlns="http://cometsystem.cz/schemas/soapP85xx_v2.xsd">
       <temp><%c1%></temp>
       </InsertP85xxSample>
   </soap:Body>
</soap:Envelope>
```

Edit file `soap.conf`, if `SOAPaction` header change is necessary.

2.3 PHP example for SOAP service

This chapter describes a simple PHP service for SOAP massages from P85xx family devices. Example uses Apache (2.2.10) web server and PHP (5.2.6). It is necessary install and enable SOAP extension for PHP. Example catch SOAP message from the device and store values to the hard disk. For more information about SOAP services and PHP see: http://php.net/soap.

```php
<?
  function InsertP85xxSample($passKey, $device, $temp1, $temp2, $temp3, $temp4,
                            $alarms, $tempU, $timer) {
    $data = "Time: ".StrFTime("%y/%m/%d %H:%M:%S", Time()).", Temp1: ".$temp1.
          ", Temp2: ".$temp2.", Temp3: ".$temp3.", Temp4: ".$temp4."\n";
    $file_write = FOpen("soap.log", "a");
    FWrite($file_write, $data);
    FClose($file_write);
  }

  $server = new SoapServer(null, array('uri' => "http://test-uri/"));
  $server->addFunction(' InsertP85xxSample');
  $server->handle();
?>
```

3 Syslog protocol

Device can send warning and error messages via Syslog protocol (using UDP protocol on port 514). Syslog message is also send if measured value alarm occurred. Device sends following Syslog messages:

Syslog message	Description
`<00001> Device restart`	Device restart
`<00001> SOAP connection error`	SOAP sending error
`<00002> Alarm channel 1 temp high/low`	Temperature alarm occurred
`<00002> Alarm channel 2 temp high/low`	
`<00002> Alarm channel 3 temp high/low`	
`<00002> Alarm channel 4 temp high/low`	
`<00003> NTP connection error`	Time synchronization error with SNTP server
`<00004> Settings changed`	Device configuration was changed via Modbus
`<00004> Hostname error`	SOAP sending error
`<00006> Clearing channel 1 alarm`	Alarm clearing message
`<00006> Clearing channel 2 alarm`	
`<00006> Clearing channel 3 alarm`	
`<00006> Clearing channel 4 alarm`	
`<00006> Testing message`	Testing Syslog message

4 SNMP protocol

By the SNMP protocol is possible read values from the device. For right OID (Object identifier) assignment is a MIB table necessary. MIB tables are available at the manufactures web pages. Device supports only SNMP version 1. In case of alarm activation, warning message (a SNMP Trap) can be sent to specified addresses. SNMP Trap can be send to the 3 independent IP address. Traps description:

Trap	Description
0/0	Device restart
1/0	Testing SNMP Trap
1/0	Device configuration was changed via Modbus
1/1	Time synchronization error with SNTP server
1/2	New firmware was uploaded
1/3	Access password clear message
1/3	SOAP sending error message
1/5	
6/3	Temperature alarm occurred/cleared

5 Device configuration via Telnet protocol

The Setup is designed for managing device settings. Setting is performed by means of telnet, or TSensor program. In this document only settings thru the telnet will be described. Access to the Setup can be protected by a password. If items in the Setup are not confirmed within 5 minutes, the Setup is ended and the device is restarted. Modified values will not be saved. Use the **Save and exit** selection to store new values.

During setting of a value in the Setup it is not guaranteed the device works with correctly adjusted values. Correct values are set upon leaving the Setup.

Principle of entering a value in the Setup:

Setup items are set by means of the command line. Enter any part of the Setup by pressing keys **0-9** followed by the **Enter** key. The Setup always prints the current value. If you do not want to change the value, go to the next item by pressing the **Enter** key. The best way to enter a blank string (e.g. as e-mail address) is to press a **space bar**, then erase it by the backspace and press **Enter**.

Contact your network administrator to get the correct values of the IP , mask, gateway. Entering incorrect values can cause the device be not found in the network or other complications!
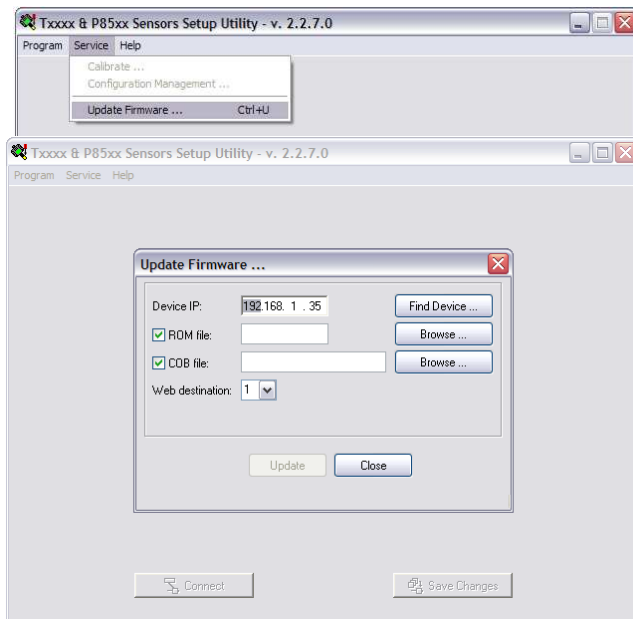

Items	Description
`\- 0 Server configuration`	
`    \- IP Address`	Setting IP address of the device. Code in brackets shows the current value. By pressing the Enter key the original setting will stay unchanged. Set the IP address to 0.0.0.0, device IP address is obtain by the DHCP server.
`    \- Set Gateway IP Address`	Setting of the internet gateway (or gateway between LANs). The value need not be entered if the device will operate only in a local network.
`    \- Netmask`	Setting of the network mask of your network. 0 means the standard preset value. Example: <table><tr><th>Mask</th><th>No. of bits</th></tr><tr><td>255.255.255.252</td><td>2</td></tr><tr><td>255.255.255.0</td><td>8</td></tr><tr><td>255.128.0.0</td><td>23</td></tr></table>
`    \- Change telnet config Password - Y`	If you press key Y, telnet ask you for a new password.
`        \- Enter new Password`	Enter a new password for device configuration (max. 4 characters).
`    \- Device name`	The description of the device. This description is displayed on WWW pages and in subjects of sent e-mails. Its maximum length is 63 characters.
`    \- MTU size`	Maximal packet size. Default setting is 1400, range is from 512 to 1400.
`\- 1 SMTP and Syslog config`	
`    \- E-mail Sending Enable`	Enabling of sending warning e-mails after alarm activation. If N is left, no e-mails will be sent to the specified address.
`    \- IP address of SMTP server`	Setting of an IP of the SMTP server. Correct setting is required for the device to be able to send e-mails.
`    \- Default mailfrom address - N`	Press Y for default e-mail sender address (sensor@[sensor's IP address]), N for user defined e-mail sender address.
`        \- Change mailfrom address - Y`	Press Y for user-defined e-mails sender address.

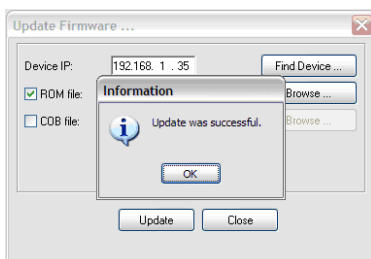| Items	Description
| | `\- Enter a new` `mailfrom address`	Enter a new sender e-mail address (30 chars max.).
| `\- E-mail address of rec1` | `\- E-mail address of rec2` | `\- E-mail address of rec3`	E-mail address of warning e-mail recipients. Maximal address length is 55 characters.
| `\- Send test e-mail?`	In case of confirmation a test e-mail is sent to the specified address.
| `\- SysLog enable`	Enable sending Syslog messages.
| `\- SysLog server IP` | `address`	Syslog server IP address.
| `\- Send SysLog message?`	Send tasting Syslog message.
`\- 2 SNMP and SOAP config`	
| `\- SNMP Traps Enable`	Enabling/disabling of sending SNMP traps.
| `\- SNMP community name for` | | `read`	Setting of the password for access to SNMP MIB tables. Max. 12 chars.
| `\- SNMP community name for` | | `write`	Setting of the password for write to SNMP MIB table of the device. Max. 12 chars.
| `\- Trap IP address 1` | `\- Trap IP address 2` | `\- Trap IP address 3`	The IP address of recipients of SNMP traps.
| `\- Send test trap?`	Sends a test trap of type `1/0` to the specified IP address.
| `\- SOAP enable`	Enable SOAP protocol.
| `\- SOAP server IP address`	IP address of SOAP server.
| `\- Target web page` | |	Path to web page (without `http://`), where the device send the message. Maximum length 100 characters.
| `\- Source port`	Device's source port. Never set to 80!
| `\- Destination port`	SOAP server destination port.
| `\- Sending interval`	SOAP sending interval.
`\- 3 WWW and history configuration`	
| `\- WWW Enable`	Enables the display of www pages.
| `\- Web Refresh time` | |	Intervals for automatic page refresh (update of measured values). Range 10-65535 sec.
| `\- History Refresh Time`	Storing interval for logging to the history.
`\- 4 Modbus and NTP configuration`	
| `\- Modbus Enable`	Enable access to the device via Modbus protocol.
| `\- Set port`	Set Modbus communication port.
| `\- Time synchronization` | `Enable`	Enable time synchronization with SNTP server.
| `\- IP address of NTP` | `server`	SNTP server IP address.
| `\- UTC time shift` |	Time shift (in minutes) between device place and UTC (GMT) time. Summer time is not supported.
`\- 5 Probe settings`	
| `\- Temperature unit`	Select of temperature unit (°C, °F).
| `\- Probe detection`	Probe detection.
`\- 6 Alarm configuration`	
| `\- Channel name`	Channel name configuration.
| `\- xxx upper limit` | `\- xxx lower limit` | `\- xxx hysteresis` | `\- xxx alarm delay`	Alarm configuration (upper and lower limits, hysteresis and time delays).
`\- 7 Factory defaults` |	This operation restore factory configuration. IP address and subnet mask will stay unchanged.
`\- 8 Exit without save`	Telnet quit, without save or device restart.
`\- 9 Save and exit`	Saves modifications to the memory and resets the device.

6 Ethernet firmware update

Customer can update Ethernet firmware if new version is available. For firmware update is necessary TSensor software. Use only firmware designed to this device. Firmware update procedure:

1. Download new firmware from manufactures web pages, install latest TSensor software. Unpack downloaded archive with firmware.
2. Turn on device and connect Ethernet connector.
3. Run TSensor with parameter `/service` (e.g. `C:\Program files\Cometloggers\TSensor\TSensor.exe /service`)
4. Open menu for firmware update. Insert device IP address and enter new firmware (`ROM file`) and new web pages (`COB file`) if necessary. Press button `Update.`

5. Please wait while new firmware is uploading. This operation takes approx. one minute. After successfully upload, will be shown following message.

7 Communication ports

Following table contain P85xx ports list.

Port		Device is Client/ server	Service/Protocol	Change port nr.	Notice
Destin.	Source				
TCP/80		server	Embedded WWW server		
TCP/502		server	Protocol Modbus TCP	✓	
TCP/25		client	SMTP		Protocol for E-mail sending
TCP/80	TCP/8080	client	SOAP	✓	Active sensing via TCP/HTTP
UDP/514	UDP/514	client	Syslog protocol		Active sensing via UDP/Syslog
UDP/161		server	SNMP v1		
UDP/162	UDP/162	client	SNMP – Trap		Active sensing via UDP/SNMP – Trap
TCP/9999		server	Telnet		Protocol for device configuration
UDP/123	UDP/123	client	SNTP		Synchronization with time server
UDP/30718		server	Configuration protocol		Lantronix & Comet UDP configuration command set
UDP/69		server	New firmware upload		New firmware upload via TFTP
ICMP/echo		server	Ping response		Ping can't be deactivated.

8 Document revision table

Following table describe changes between firmware versions.

Date	Document revision	Web and firmware version
05.03.2009	IE-SNC-P85xx-apx-01	4.5.1.20/2.05