

PTZ-BOX

ELECTRONIC VOLUME CONVERTER

Software

User guide



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Configuration, read-out and data transfer for the PTZ-BOX.

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Literature

- [1] Gas Volume Converter PTZ-BOX – technical description, user instructions, installation guide, quick test.
- [2] Help for the program Notepad.
- [3] Program uElcViz

1 Introduction

The purpose of this user manual is to introduce the program PTZ-BOX.exe and its functions and to show you how to use the Gas Volume Converter PTZ-BOX when communicating with a computer (PC).

1.1 The program functions

The program is designed to communicate with the device PTZ-BOX, for configuration, to change parameters and to evaluate the measured values and archived data from the device or from an existing file on the PC.

The program has the following functions:

- setting the variable parameters of the device;
- reading and displaying the current measured values;
- reading archive data from the device and saving them to file;
- processing data from the device or from file on the screen and printing them;
- generating output files with fixed data structure for further processing.

1.2 PC system requirements

The program requires a 486 class processor or higher with at least 8 MB RAM. One serial port RS-232 (COM1–4) is necessary to communicate with the converter connected via an optical reading head or a cable. The program runs under WINDOWS 3.11, WINDOWS 9X, WINDOWS XP and WINDOWS 2000. Some knowledge of working with one of these operating systems is assumed for working with the program. To install the program you need about 2.5 MB free space on your hard disk.

1.3 Installation

Insert the installation floppy disk with the program PTZ-BOX.exe. Run the program SETUP.exe and follow the instructions on the screen. The installation program will suggest a folder for installing the program modules. If you wish to change the suggested disk or folder, make the change and confirm it with the key Enter. It is a standard installation procedure used in other programs.

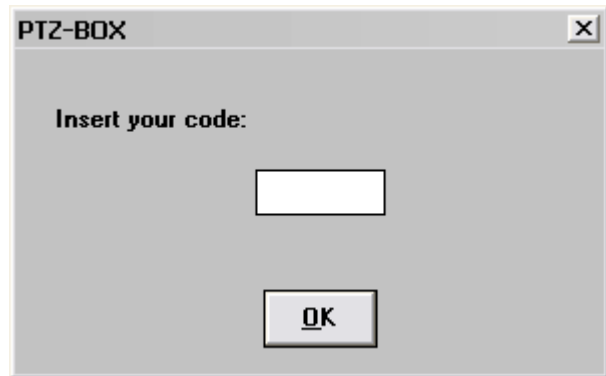
When the installation is finished a program group is created with the name **VEMM TEC**. The group contains an icon to start the program PTZ-BOX.exe.

1.4 Starting the program – password for changing parameters

Every time you run the program you will be asked for the password. If you have no user password, you can continue by pressing **OK**, but in this case you cannot make any changes in the device.

You have to use the password (6 digit code) for changing parameters. A code is stored in the device together with a description of every change in the *Archive of Settings*. To enable any change, you have to set the *mode switch* on the device in the SET position (see [1]).

Picture 1 Enter your password




1.5 Connecting the device – communication settings

The device is connected to the PC either via an optical reading head HIE-01 (which is an optionally delivered component) or cable. The transmission speed is 9,600 baud.

When you select the menu **Options - Communication** in the main program, a dialog box appears. Select a suitable serial port on your PC (1 to 4) and enter the network address. If this address is unknown, and there will be communication only with one device, a zero (0) can be entered.

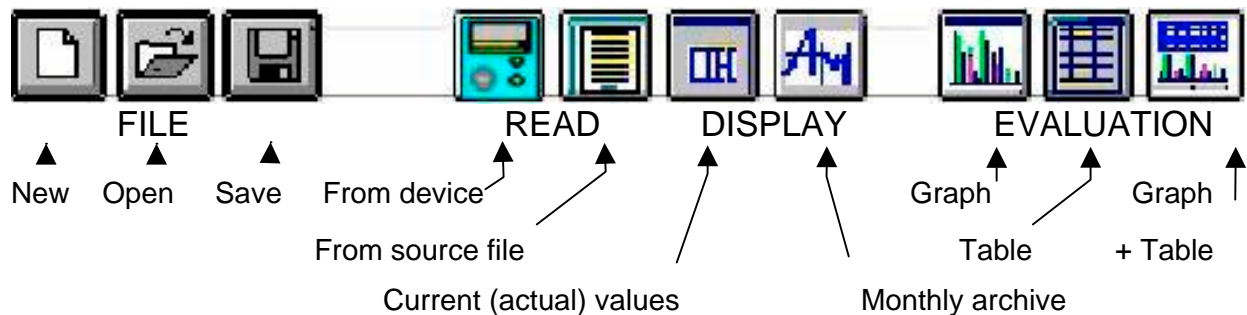
2 Description of the program commands

The program is operated via a main menu, which contains several groups of commands. When you activate a menu item, the command is carried out or a dialog box appears for entering further information. In general, if you close a dialog box by pressing the button **OK** or **Write** the required action is carried out. If you close the box by pressing the button **Cancel** or the button  in the top right corner, no change is made.

The menu items can be activated with the mouse or the keyboard. You move the cursor to the required item and click or press *Enter* or use a keyboard shortcut (a combination of the key *Alt* and the underlined letter or the key indicated in the right-hand part of the menu). Frequently used commands are displayed as icons on the toolbar under the main menu.

A brief description of the command is displayed on the status bar when you move the cursor over the menu or over the toolbar.

Picture 2 Description of the toolbar



The data source is displayed to the right of the toolbar if you are reading from a file. See Section 2.2 (next page).

2.1 File, Edit, Window

These are standard menu items for working with files. Most of the data collected by the program can be saved as text files, however, the program will not allow their editing without renaming them.

Text search is integrated under the menu **Edit** and the other commands are identical to the menu **Edit** in [2]. The menu **Window** can be used to arrange automatically the open windows and to select from them. Other commands are usual Windows operations and are not described here. Text files of about 60 KB can be edited and displayed.

2.2 Read

The command is used to read all the source data, either from the device or from a file. The program operation is also changed and all further readings, displays and calculations are performed with this new source file.

2.2.1 Full reading from device

The device must be correctly connected before the command is performed.

This command is used to read all the data from the device and to save them to a file called *DM.tmp* in the folder TEMP. You are asked whether you want to save the file under the customer's name **.*dm* in the folder DATA (the first nine digits from the customer's number stored in the device are entered to replace the asterisks). If the file already exists, you are asked whether you want to replace the old file. ***Because the source file contains all the data necessary for further processing, this file should be copied to another folder (archived).***

2.2.2 From source file

This command reads from file `*.*dm` (the first nine digits from the customer's number are entered in the filename instead of the asterisks). Then it can be used to display and evaluate the data.

2.3 Displaying the data

This group of commands works with data read from the device or from a file as made by the read command. To display data from a file you have to enter the command **From source file** (no reading is then done from the device). To display archives from the device the command **Full reading from device** should be activated.

Every file created by a command from this group contains a header with the following data:

- device name
- version of SW_{MEASURING} – SW_{COMMUNICATION} - HW
- serial number of the device
- device type
- date and time of archive reading
- customer number
- network address of device

When you display an archive the program asks you whether you wish to create a corresponding file, i.e. the customer number and a specific suffix. The program creates temporary files for displaying in the folder TEMP (they are continuously overwritten). If you answer OK, a copy of the temporary file is created in the folder DATA. You can make a back up (under Windows) from there to a corresponding customer folder.

2.3.1 Monthly archive

The monthly archive is a data file that contains 21 monthly records. The monthly record is updated in the device every hour, the old monthly record is closed and a new one is made as of the first day and hour of the new month and a new monthly record is created. In addition to these records, the monthly archive contains records of time points when the device was started and stopped, always with the time stamp of the event (see Section 1).

When the archive is full, further records are cyclically overwritten from the beginning of the archive, but their record number increases continually. You can find out from the source file according to the record number how many records have been stored in the archive. The values of the recorded volumes correspond to the meter values. To find out the monthly consumption, use the menu **Evaluation**.

The records displayed in the monthly archive are separated by a blank line. One record is displayed on three lines:

1. The first line starts with the record number followed by the date and time when the record is saved in the archive and the pre set mode. The mode is set by the position of the *mode switch* in the device. RUN – the measuring mode; SET – to set the parameters of the device (see [1]). Every time the mode is changed from RUN to SET, one record is saved to the monthly archive with the current status at the time of the change (indicating the RUN mode). The subsequent change from SET to RUN saves one record to the monthly archive with the current status at the time of the change (indicating the SET mode), another record is created and the values are updated in it every hour (indication of the RUN mode).

2. The second line contains the following items:

Kp	- gas meter factor	[m ³ /imp]
Vs	- corrected (base) volume at base conditions	[m ³]
Vp	- volume at operating conditions - primary	[m ³]
eVb	- corrected (base) volume under error conditions	[m ³]
eV	- primary volume under error conditions	[m ³]

3. The third line contains the following items:

Qm	- maximal uncorrected (actual) monthly flow (day, hour)	[m ³ /h]
Vdm	- maximal base daily volume (day) (daily consumption, maximum of the month)	[m ³]
Vhm	- maximum base hourly volume (day, hour) (hourly consumption, maximum of the month)	[m ³]
As	- accumulated status (see [1])	

A file called *.*ex* is created under the customer's name when the temporary file of monthly records *AM.tmp* is created in the folder DATA. It can be further processed in a spreadsheet program, such as MS Excel. The file has a standard header (see 2.3) and all the records from the monthly archive are written out. Every record contains a record number, a time stamp, the mode of the device and the volumes: operating, base, error operating and error base. You can calculate the gas consumption for a required period as the difference between the volumes in question.

2.3.2 Status archive

The status archive contains records when an error situations began and ended (for details see [1]). Every record contains the date and time of the event and the event type is described in words in the printout. The length of the archive is about 500 records. When it is full, new records begin to overwrite the older ones. The content of this archive can be deleted, see 2.5.6.

2.3.3 Archive of settings

The archive of settings is updated by these events: setting this archive to zero; changing the gas meter factor; changing the volumes; changing the serial number of the gas meter and the customer number; changing the default

values of temperature and pressure; changing the compressibility factor; changing the gas composition; changing the date and time. The record always contains the record number, the password of the operator making the change, a time stamp, the current gas meter factor and the values of all the volumes (operating and base volume, error operating and error base volume).

The capacity of the archive is more than 100 records. When the archive is full, no further records are entered, an archive error is signalled, and no further changes may be made. *This archive cannot be deleted by the user!*

The official seal has to be broken to delete the archive.

2.3.4 Limits archive

The limits archive serves to display the last ten pressure and temperature values that exceed the measuring range. The values are only indicative. Every record is time-stamped.

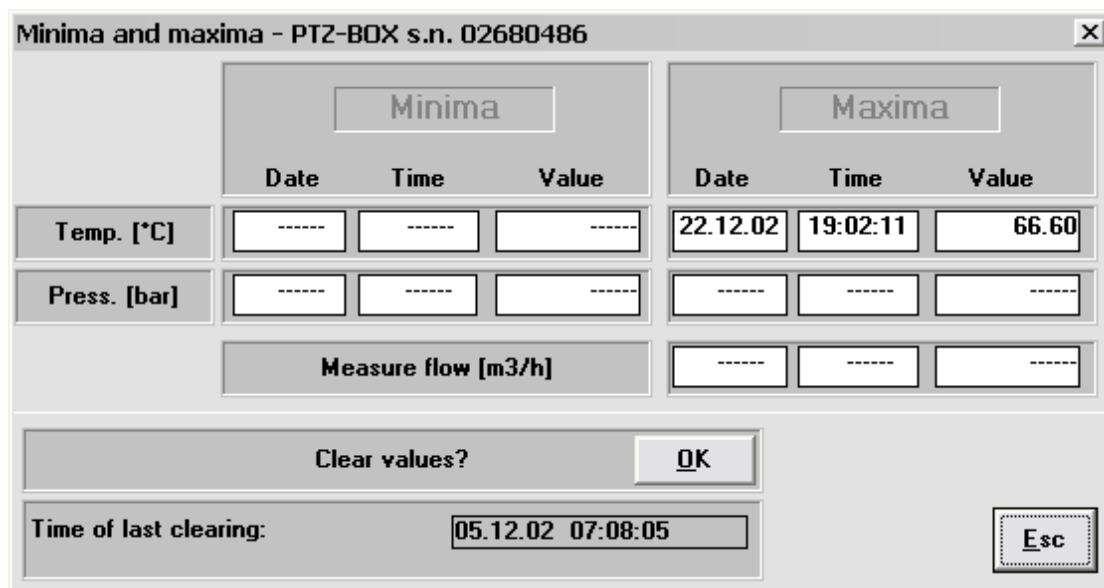
2.3.5 Date and Time, Parameters, Service Data, Configuration

The commands on this menu (**Display**) display the device settings and correspond to the same commands on the menu **Settings**. The menu **Settings** is not active when reading from a data source file. The dual commands make it possible to divide the work with the device conveniently. This menu cannot affect the device or the results of the measuring and calculations.

2.3.6 Minimum and maximum values

This selection will read out and display a panel with minima and maxima of temperature and pressure and the maximum operating flow, including the time to which the values are related.

Picture 3 Minimum and maximum values



The screenshot shows a window titled "Minima and maxima - PTZ-BOX s.n. 02680486". It contains two main sections: "Minima" and "Maxima". Each section has a table with columns for "Date", "Time", and "Value".

	Minima			Maxima		
	Date	Time	Value	Date	Time	Value
Temp. [°C]	-----	-----	-----	22.12.02	19:02:11	66.60
Press. [bar]	-----	-----	-----	-----	-----	-----
Measure flow [m3/h]	-----			-----	-----	-----

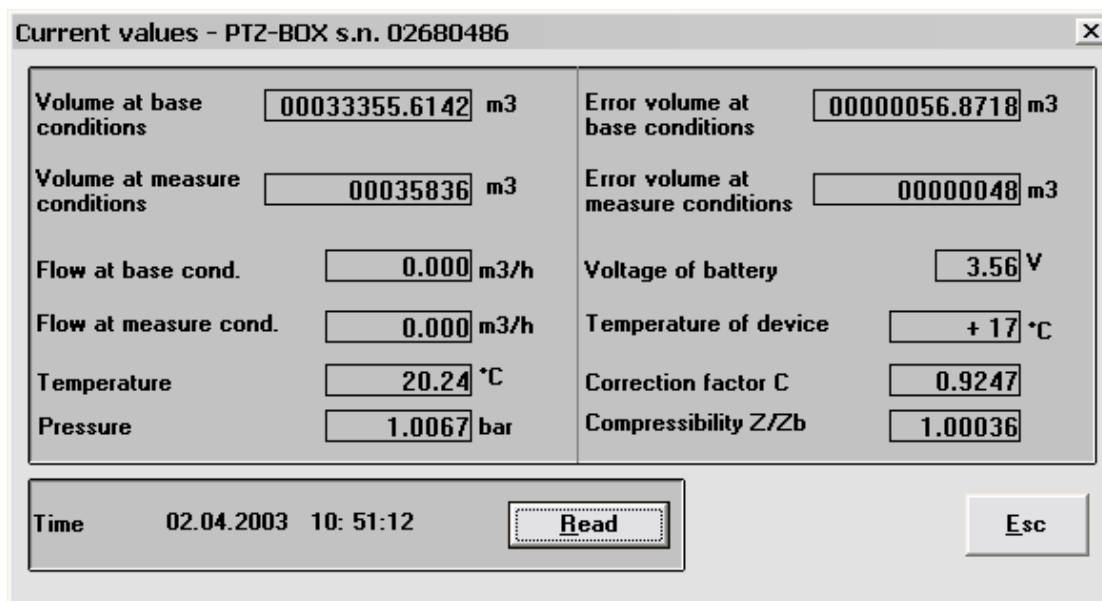
At the bottom, there is a "Clear values?" button with an "OK" button next to it. Below that, a "Time of last clearing:" label is followed by a text box containing "05.12.02 07:08:05" and an "Esc" button.

The panel also displays the time of the last reset of the maximum and minimum values. The button **OK** is used for the reset and the reset time record is also updated. The device must be in the mode SET, i.e. measuring and conversion is not performed. After resetting and re-reading, the dashes are displayed in place of the values (on the condition that the values are out of range).

2.3.7 Current (actual) values

Actual values are read out from the device as measured in the actual period.

Picture 4 Displaying current values



Current values - PTZ-BOX s.n. 02680486			
Volume at base conditions	00033355.6142 m3	Error volume at base conditions	00000056.8718 m3
Volume at measure conditions	00035836 m3	Error volume at measure conditions	00000048 m3
Flow at base cond.	0.000 m3/h	Voltage of battery	3.56 V
Flow at measure cond.	0.000 m3/h	Temperature of device	+ 17 °C
Temperature	20.24 °C	Correction factor C	0.9247
Pressure	1.0067 bar	Compressibility Z/Zb	1.00036
Time 02.04.2003 10: 51:12		<input type="button" value="Read"/> <input type="button" value="Esc"/>	

The operation can be repeated with the button **Read**. When finished (with the button *Esc*), the last values read can be added to the file **.oh*. If the device is in the SET mode, the values are not updated. This state is indicated by a text in blue colour between the buttons Read and ESC "SET mode doesn't measure". Pls. note: In the picture above the device is in RUN mode.

2.4 Evaluation

This menu is used to display the monthly consumption calculated from the records in the monthly archive in graphic or a tabular form. The commands are executed only when the service **Read** was used. Both primary and base gas consumptions and error consumptions are displayed.

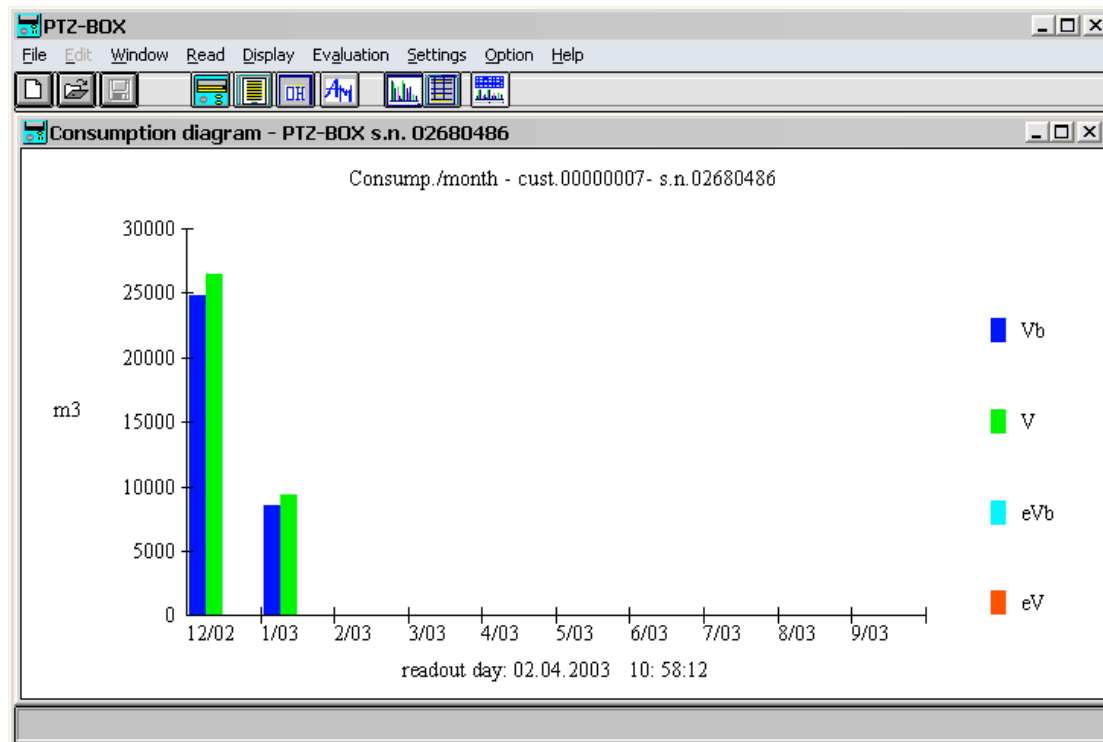
If the time stamp in one of the records is incorrect, the data cannot be displayed correctly (for example an incorrect time setting or forgetting of the time setting after changing the battery). Incorrect states may occur also when setting the operating volumes, or the gas meter factor. Some of the

consumptions may be evaluated only for a part of the month, if a record exists for this month, however it is incomplete. It is therefore desirable to check the archive of settings at each evaluating of the monthly archive. The consumption can be displayed and printed out in form of a table or a bar graph. A table and a graph can be also displayed simultaneously.

2.4.1 Graph

This program function is used to display graphically the timely progress of the monthly consumptions. They are calculated as difference in the recorded volumes. There is the customer number and serial number of the device and the date when the data was read from the device. The displayed graph of monthly consumptions contains: V_s – base (standard), V_p – primary, eV_b – error base volume, and eV – error primary volume. Each value is shown in a different colour.

Picture 5 Graphical evaluation

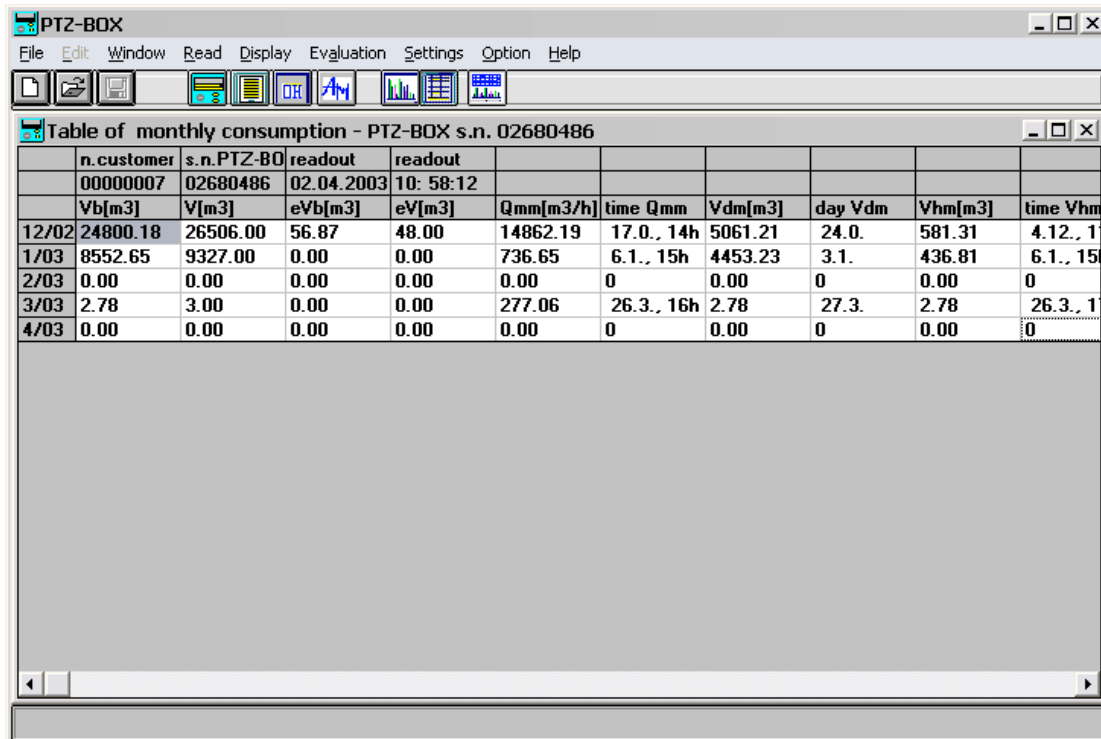


2.4.2 Table

The table of consumptions contains the customer number, serial number of the converter, read out date of the data and values of the consumptions. Consumptions are recorded chronologically as they are logged into the archive.

Each line is marked with the month and the last two digits of the year. For example, for March 2001 it is 3/01.

Picture 6 Tabular evaluation



The screenshot shows the PTZ-BOX software window with a menu bar (File, Edit, Window, Read, Display, Evaluation, Settings, Option, Help) and a toolbar. The main display area is titled "Table of monthly consumption - PTZ-BOX s.n. 02680486" and contains the following table:

	n.customer	s.n.PTZ-BO	readout	readout						
	00000007	02680486	02.04.2003	10: 58:12						
	Vb[m3]	V[m3]	eVb[m3]	eV[m3]	Qmm[m3/h]	time Qmm	Vdm[m3]	day Vdm	Vhm[m3]	time Vhm
12/02	24800.18	26506.00	56.87	48.00	14862.19	17.0., 14h	5061.21	24.0.	581.31	4.12., 1
1/03	8552.65	9327.00	0.00	0.00	736.65	6.1., 15h	4453.23	3.1.	436.81	6.1., 15
2/03	0.00	0.00	0.00	0.00	0.00	0	0.00	0	0.00	0
3/03	2.78	3.00	0.00	0.00	277.06	26.3., 16h	2.78	27.3.	2.78	26.3., 1
4/03	0.00	0.00	0.00	0.00	0.00	0	0.00	0	0.00	0

2.4.3 Graph + table

A simultaneous displaying of consumption table in the upper part of the screen and the corresponding bar graphs in the lower part of the screen is performed. If you move the mouse cursor on the surface of the displayed graph and click the left button, a graph is displayed for the maximum monthly operating flow, then for daily maximum consumption, for hourly maximum consumption according to the base volume and again the basic graph of consumption. You can scroll through the table using the horizontal and vertical scrollbar.

2.5 Settings

The commands of this menu are used to display and modify all the modifiable parameters of the device. The white fields in the dialog boxes can be modified, the grey fields are only displayed for information. In some fields only default values can be used.

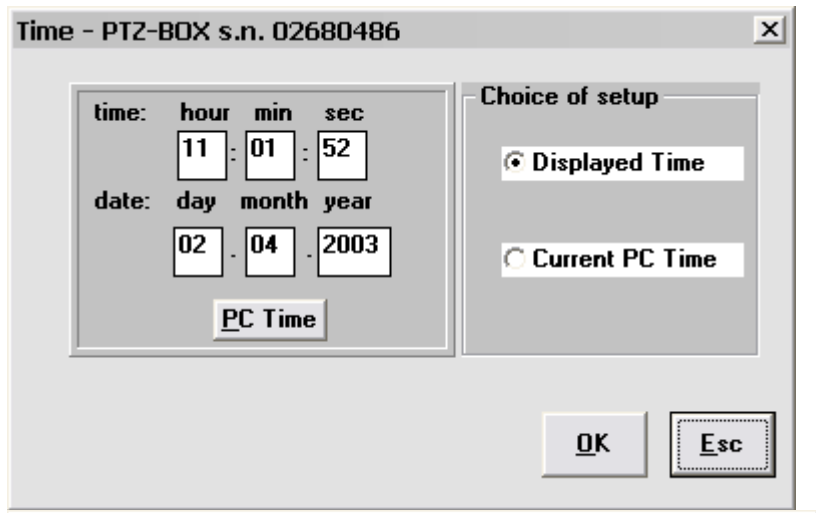
Changes are enabled by entering the correct password of the operator, who is authorised for performing changes. The PC port must be correctly configured (refer to Communication), connection must be established, and the mode switch must be set in the position SET. If the program asks the mode switch to be moved to the position SET, the command has to be performed again after

this switching over (close the dialog box of the old command and repeat the command).

2.5.1 Date and time

This command displays the time and date in the device. We recommend to use the Central European Time (CET) or the local time zone time without changing to Summer Time. This means that during the summer time, there is a time difference between the local time and the device time. The button **PC Time** enters the time as set in the PC in the editing fields in the window.

Picture 7 Setting the time



The device time is set after pressing **OK** according to the option in the right-hand part of the panel. The selection **Displayed Time** means that the data just being displayed in the left-hand part of the panel are entered into the device. If you wish to enter the computer time, set in the right-hand side of the panel the selection **Current PC Time**.

Note that shifting the time forward causes a time gap in the stored archives and shifting the time backward causes a time overlap in the stored data.

2.5.2 Parameters

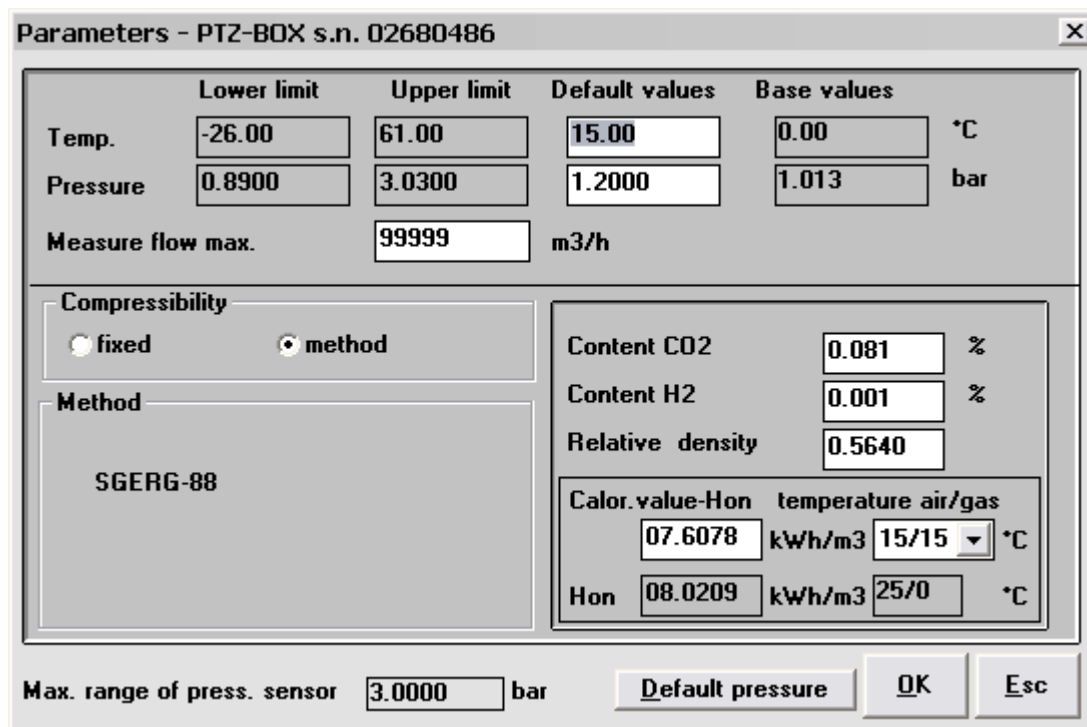
The dialog box that appears when you enter this command displays the parameters of the device. You can change the default fixed values of the temperature and pressure that will be used to calculate the base volume if the measured values are outside of the measuring range. The measuring range is indicated with limits. Base values used to calculate the base volume in normal operation are displayed. The value of the maximum of the flow (Measure flow max.) can be changed. If exceeded, an error message will be generated. More details see [1] chapter 2.1.2..

The compressibility factor can be configured as a fixed value or calculated by one of the pre set methods (the method cannot be changed on site pls. see also [1], it is pre set at the time of the order). For the method AGA NX-19 can following gas parameters be set: amount of CO₂; N₂; relative density. For the method SGRG-88 can following gas parameters be set: amount of CO₂; H₂; relative density and calorific value. This method requires the calorific value

under conditions: air temperature in the room (when starting the combustion)/temperature of the entering gas (corrected for value at 0°C) with a reference to value of 25°C/0°C. For a conversion of values at other temperatures the program contains an easy tool. Conversion factors according to ISO 12213-3 are : $H_{on}(25/0) = H_{on}(0/0) \cdot 0.9974$; $H_{on}(25/0) = H_{on}(15/15) \cdot 1.0543$. It is recommended, to select first the desired option from the option menu "temperature air/gas" and afterwards enter the calorific value. The program makes a correction to reference 25/0 °C.

The parameters are checked for range according to the current configuration of the device. By pressing the button "Default pressure" an entering with calculation of the atmospheric pressure referring to the sea level altitude and the relative pressure will be performed.

Picture 8 Device parameters



	Lower limit	Upper limit	Default values	Base values	
Temp.	-26.00	61.00	15.00	0.00	°C
Pressure	0.8900	3.0300	1.2000	1.013	bar
Measure flow max.		99999			m3/h

Compressibility
 fixed method

Method
 SGERG-88

Content CO2 0.081 %
 Content H2 0.001 %
 Relative density 0.5640

Calor. value-Hon 07.6078 kWh/m3 temperature air/gas 15/15 °C
 Hon 08.0209 kWh/m3 25/0 °C

Max. range of press. sensor 3.0000 bar Default pressure OK Esc

2.5.3 Service data

This data are read out from the device in most communication operations. Some of the values can be modified via the service data panel (see a)- f) below); others are only indicative. After pressing the button **Status**, you see in the bottom left-hand part the current status of the device with a written description. You can get back to the original display by pressing the same button which changes its description to **Info**.

Changing the service data

- a) Customer number
 - up to 12 characters

- letters, numbers and underscores can be entered
- Note: The names of the data files are derived from the customer numbers in the way described in chapter 2.2 above.
- b) Serial number of the gas meter
 - up to 12 characters
 - letters or numbers and blank spaces can be entered
- c) Network address (address of the device in a network)
 - a number from 000 to 999 (default is 000)
- d) Gas meter factor
 - fixed from the roll-down menu items under the arrow 1; 0.1 ; 0.01 (take care: expressed in m³/imp; values on some gas meters are expressed in imp/m³)
- e) Measuring interval
 - fixed from the roll-down menu items under the arrow 10; 15; 20; 30 sec.
- f) Store time (Start of the gas day)
 - optional hour from the roll-down menu or entering the value after using the option "other"

Picture 9 Service data

Service date - PTZ-BOX s.n. 02680486

Type PTZ-BOX	000A4D	Network address old	000																							
S.n. PTZ-BOX	02680486	Network address new	000																							
Version SwM,SwK,Hw	2.2-1.4-1.0	Input rate Kp	1 m ³ /imp																							
Customer number	00000007	Measure interval	20 sec																							
S.n. gasmeter	123456789	Start of measuring:	02.04.03 10:16:53																							
S.n. temp. sensor	000001090549	Store time:	7 o'clock																							
S.n. press. sensor	000001191078	<table border="1"> <thead> <tr> <th colspan="5">Information</th> </tr> <tr> <th></th> <th>C1</th> <th>C2</th> <th>C3</th> <th>C4</th> <th>C5</th> </tr> </thead> <tbody> <tr> <td>O:</td> <td>BB1E</td> <td>0C2E</td> <td>8A88</td> <td>5CBD</td> <td>3660</td> </tr> <tr> <td>S:</td> <td>BB1E</td> <td>0C2E</td> <td>8A88</td> <td>5CBD</td> <td>3660</td> </tr> </tbody> </table>		Information						C1	C2	C3	C4	C5	O:	BB1E	0C2E	8A88	5CBD	3660	S:	BB1E	0C2E	8A88	5CBD	3660
Information																										
	C1	C2	C3	C4	C5																					
O:	BB1E	0C2E	8A88	5CBD	3660																					
S:	BB1E	0C2E	8A88	5CBD	3660																					
<input checked="" type="checkbox"/> RUN mode	Battery capacity	97 %																								
<input type="checkbox"/> write enable	Status byte	00																								
<input type="checkbox"/> Calibration																										

Write Status Esc

Significance of the "Information"

C1 - checksum of the measuring program; C2 - checksum of the communication program; C3 - checksum of the memory of invariables (production related); C4 - checksum of the memory of invariables (user related); C5 - checksum of the expanded memory

O: - expected values, S: - actual values

The states of the device are indicated by: "RUN mode, write enable, calibration, battery capacity and the status byte" .

2.5.4 Configuration

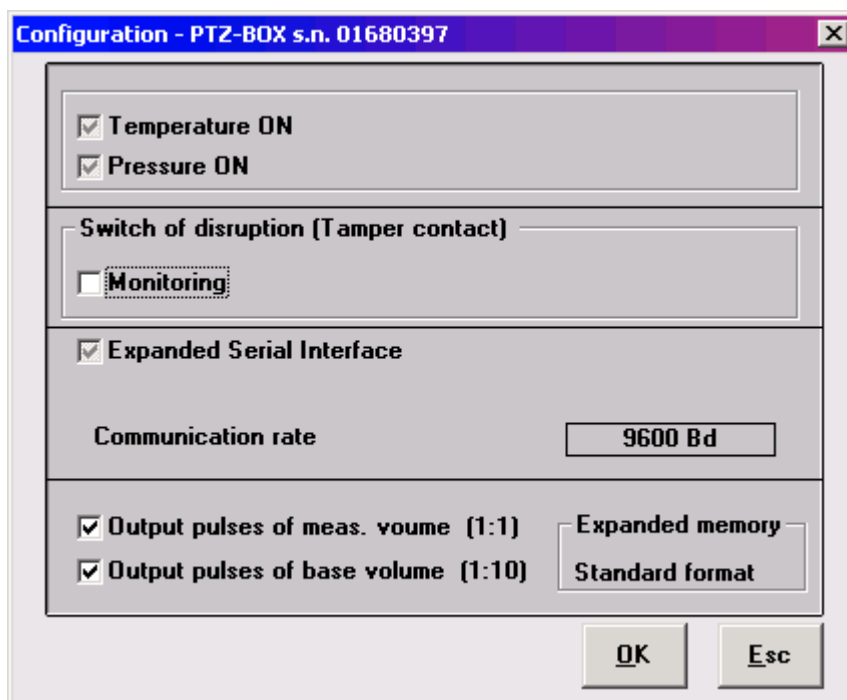
If the device is fitted with pressure and temperature sensors and the fields **Temperature ON** and **Pressure ON** are marked, the device works as a PTZ corrector. This option cannot be changed afterwards by the user.

If the device is fitted with an input for gas meter tamper contact (a third wire in the device input cable), you can select monitoring of this contact as its change to the error state ('0' or '1').

If the device has output circuits, you can select generation of the output pulses by crossing the appropriate fields.

If the device has an expanded memory, this information is visible at the bottom right-hand site of the screen. For more details pls. see [3].

Picture 10 Dialog box for configuration



The button **OK** enables to write the changes into the device.

2.5.5 Volume setting

This command displays a dialog box with the values of the meters of primary, base, error primary, and error standard volume. You can change or reset the values. Only the fields with grey text can be changed.

2.5.6 Resetting the status archive

This command resets the status archive. The current status can be set to zero with the device buttons after repairing the defect (see [1]).

2.6 Option

This menu serves to set the communication parameters and to test the device.

2.6.1 Communication

Here the PC program parameters for communication between the PC and the device can be set. Just select the computer serial **port** to which the device is connected (COM 1 –

COM 4) and the network **address** of the device that the PC will transmit during communication. Any transmission with this zero network address will be responded by any device with any pre set address. The transmission speed is 9.600 baud.

If a file has been processed, you can *re-open communication with device* after closing all the windows by ticking the appropriate field.

2.6.2 Standard units

By selecting this option the program performs all printing and displaying of values in standard units such as kPa, °C, m³, otherwise a displaying in units as configured in the device is performed (bar, °F, etc.).

2.6.3 Test of device

This command results in calculation of checksums of all the memories. Error states are tested and the actual device status will be set. This can be displayed when using the menu "Service data".

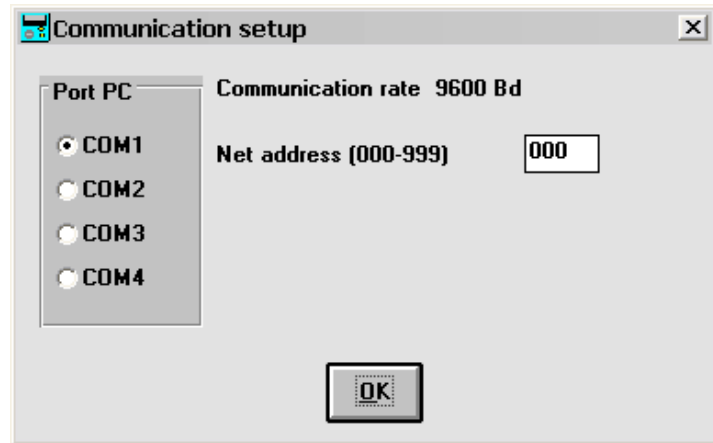
2.6.4 Clear status

This command clears status in the device. Similarly as above, error states are tested and the actual device status will be set. However, the clearing is not performed unless the existing error(s) is removed. Just the correct password has to be entered when starting the program, clearing can be performed also in RUN mode. Refer also to [1] chapter 2.1.2.

2.7 Help

The electronic help serves as a brief guide.

Picture 11 Communication setup



2.7.1 Menu, Read, Display, Evaluation, Settings, Option

This describes the individual menus and the activities controlled by them.

2.7.2 Accumulated status

This describes the meaning of bits in the status byte.

2.7.3 About folders (directories)

This displays help with a description of directories and a description for creating of files which are to be saved. It explains the types of data saved and identifies the suffixes used.

2.7.4 About the program

This menu item displays information about the program version.

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