



GM WIN

Operating manual

June 2008



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FIRST STEPS AND FIRST ENCOUNTER

1.1. BEGINNING.

DEAR USER,

Presented manual refer to the software designed for correctors in cooperation with many people working in gas industry. All suggestions and observations of user had a significant influence not only for software but for all our products as well. We did our best to make our commodities user-friendly and intuitive, however, this manual may be useful when encountering some problems.

Software itself consist of several programs In versions dedicated for Windows (minimum 95 or NT 4.0). They are: **GMWin.exe** (Reading and visualization of data) and **MacWin.exe** (visualization of data and reporting). **WService.exe** is created to configure the parameters of correctors and converters. **GazTest.exe** is dedicated for transmission control and correctness of implementation of data exchange protocols in correctors.

For most of the users **GMWin** and **MACWin** are sufficient for regular work. **WService** is designed for the group of users entitled to set working parameters of correctors.

Software intended for reading data and data treatment are available on our website www.common.pl. If you need programs for correctors' configuration you can achieve it by sending an application to one of the following emails: common@common.pl or jjaworski@common.pl or by fax: +48 42 253 66 99 or by snail mail on the following address:

Common S.A.
ul. Aleksandrowska 67/93
91-205 Łódź

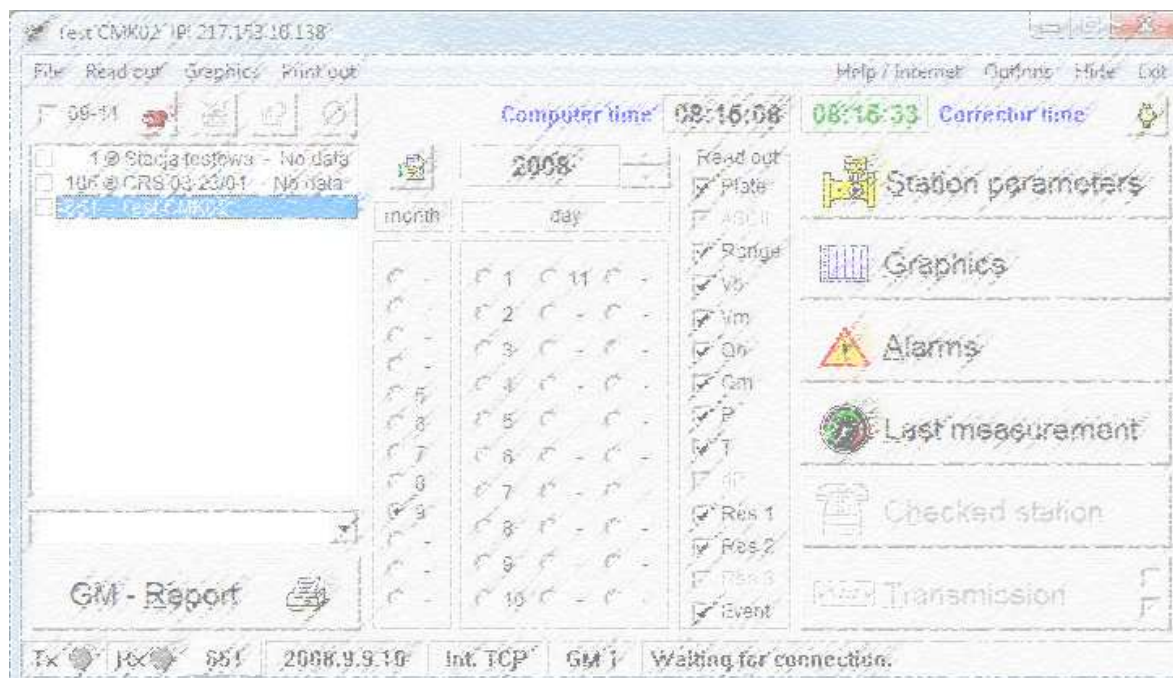
Dear User!

This manual is mainly describing GMWin program, however you will find some useful information about the other programs. I hope all information is comprehensible enough for easy work with our software. I did my best to write this manual for everyone with basic knowledge of the computer operation. Some parts are appropriate for advanced users what, nevertheless, shouldn't discourage anyone from reading and practicing.

In case of operating the featured programs you shouldn't count on fully intuitive usage. On the basic level you ought to be familiar with some extracts of this manual, however, it is not adequate for either full possibilities of the software or devices. Thus, I've been waiting for all suggestions considering this manual. I will make use of them updating the following versions.

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GM Win

Abstract:

This program is designed for performing readouts and making a graphical interpretation onto personal computers. It is possible via serial port RS-232 (cables are supplied with a device). The media may vary among broadband, dial-up line, GSM or GPRS connections.



2. JUST BEFORE THE BEGINNING.

2.1. Requirements.

If your computer works under Windows 95 or Windows NT 4.0 it simply means that parameters of your hardware are good enough to cooperate with our software. Rule is: the faster the better.

As for the local ports at least 1xCOM or 1xUSB is necessary and for the remote readings internal/external modem or LAN socket. If you have many COM ports your operating system (OS) will start very slowly because installing everyone takes some time. So, be patient.

2.2. Prepare to work.

It is quite important to keep your directory tree in order. Databases consist of lots of short files which may obfuscate the clarity. First thing is separation program files from databases' files. If you read just one gas station you can quit this chapter, however, such operation can make your life easier in the future. Another problem you may face is repeating numbers of GAZ-MODEM addresses of converters. Then you should create a separate database for this device. The same files of programs may attend to several databases. It is highly discouraged to copy files to every database because when upgrading you probably will be confused with the factual version of the software. Recommended format of file name is DOS format 8.3. We also suggest to work on the newest version of software always available on our [website](#). However, if you find any errors in our software, please report it directly to [Mr. Jan Jaworski](#).

**Turn off Energy Safe Mode in Windows to prevent
from accidental change of the mode during operation.**

For desktop computer which usually are dedicated for many tasks and eventually for gas station readings we should install standard option of software. We recommend using **GMWin** program because it has lots of options specially intended for cooperation with GSM and analog modems.

2.3. Installation of software.

This chapter includes a description of installation procedure in the way it prevents from disorder on your computer. It is particularly useful when working with great amount of gas stations, recurring GAZ-MODEM addresses or users working on the same data. Installation is based on a few steps:

1. Download software from our [website](#). (we are under construction of new website, so this link may not be working. So please go to www.common.pl and find a Download section)
2. Unpack self-extracting archive.
3. Launch **setup.exe**
4. Follow the instructions.

If you have software on a CD please start from launching **setup.exe**.



Usually database do not consist of many gas stations. Actually, I mean it is just one gas station. Our recommendation is to create a folder for programs and data. The database is automatically established in the same location where the main program is. If any database already exists in the specified location it will be read. In case of working with many gas stations you should definitely separate database files from main programs files.

You CAN work with several databases on one working copy of program.

The configuration of GMWin program is inside **MAC.INI** file. It is created automatically during the first startup in the same directory the program resides. If asked please point at the database directory. Mac.ini is made up of global settings for all gas stations in database. Individual settings are inside the database in **??_MAC.INI** where ?? is the number of the station. During the first startup the program asks for the location of the directory with the database as well as **EVENTS.INI** file consisting a log of all events.

IMPORTANT!

Working on Windows NT4.0/2000/XP with GMWin or WService user must have at least Power User privileges. When working with MACWin Guest privileges are satisfactory. In case of many users working in the network, main programs should be installed on server in the read-only directory so everyone uses the same programs.

Besides programs popularized only as an executable compilation you can choose a version with separate libraries (installation disks). This case working on Windows 2000/NT user must have an administrator privileges and make sure he can write in C:\WINNT directory with its subdirectories.

USERS.CFG file is necessary to run service programs. It is used by SERVICE and WSERVICE programs.

2.4. Very important extract.

The most important thing just before you start to work with our software is checking the computer clock. Keep in mind that converters are designed to count money in time. Computers in domain check their time with domain server every 5 minutes by default. Domain server should check its time with some authenticated time server. But... All depends on the administrator which might change default settings and turn those services off. He can even deny you to change time on your local machine what may be problematic when clocks are divergent.

TIME = MONEY. So please, check local time as often as possible.

If WService is in the same directory as other programs, GMWin before readout will ask you for a time synchronization (if necessary). In other case time synchronization is not performed. You can force computer to check time by checking option in Read out/Time Control submenu.

2.5. Directory structure.



All programs described in this chapter are 100% compatible in transferring data.

Example of files structure.

C:\COMMON\

MAC001	Gas station with MAC address 1
MAC003	Gas station with MAC address 3
C_.ZDA	Events list
C__STCJ.CFG	Gas station configuration file (old MAC, no longer in use)
C__MAC.INI	Gas station configuration file (GMWin and new MAC)
C_INF.TXT	Data information (refers to MACM)
C__CHWIL.DAT	Temporary data (current data)
C_980101.DZN	Day data (January, 1 st 1998)
C_980102.DZN	Day data (January, 2 nd 1998)
C_980130.DZN	
C_980131.DZN	
C_9801.MSC	Month data – consumption in base conditions [m ³]
C_9801.LDB	Month data – consumption in measurement conditions [m ³]
MAC700	Directory with data of gas station with 700 GAZ-MODEM address

The GAZ-Modem address can accept values between 1 and 9999 according to the way of calling data base files. First two characters of the file name depend on gas station address. For addresses from 1 to 27 there are consecutive letters of the alphabet followed by an underline sign (A_ ... Z_). For bigger addresses designation is changed by adding another letter instead of the underline sign (AA, AB, AC... etc.). Directory also contains text files with last transmission report, user ID performing a readout, name plate and other useful information.

Configuration data of Windows' programs are written in MAC.ini file. Location of the file is usually in main directory of data base (common for all programs), directory proper for a gas station (concerns a certain gas station – with special prefix) or inside a directory where main program is executed.



3. TRANSMISSION, DATA ANALYSIS, CONNECTION TESTS – GMWIN PROGRAM

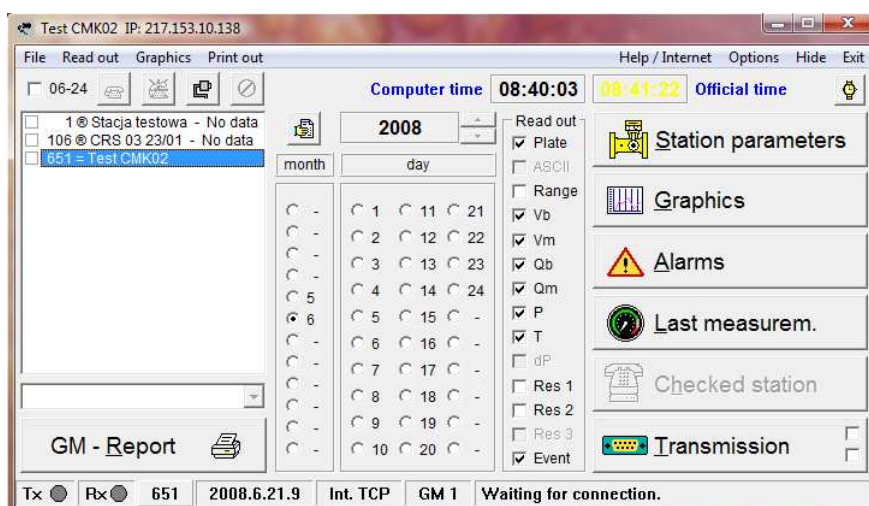
3.1. Introduction.

GMwin.exe is designed for performing readouts and making a graphical interpretation onto personal computers. It is possible via serial port RS-232 (cables are supplied with a device). The media may vary among broadband, dial-up line GSM or GPRS connections.

Software is updated very often and all versions are always available free of charge on our website www.common.pl

3.2. Main Menu.

Main window is divided into two major parts. Functions used most often are specified on the right side of main panel. Moreover the same functions are available in top menu. GM-Report button opens MACWin.exe responsible for graphical representation of obtained data and for creating reports. In case there is no MACWin.exe file inside GMWin directory, this button is invisible.



Picture 1: Main Window of GMWin program.

On the left side of the window there is a list of available gas stations. The list contains Gaz-Modem address, last transmission indicator and the name of the station. By clicking the name of the gas station we choose the active station ready for transmission. Every station has an indicator which informs the operator whether or not the station is queued for readout. After checking desired boxes you can read several gas stations one after another. Just press Transmission.





Useful option!

If you click right button of the mouse on elements of the main window a context menu appears with appropriate commands for this element. The same functions can be also found in File menu.



Just above the list with gas stations there are: a box with date and four buttons for checking the gas stations.

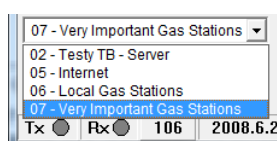
     Functions of all buttons are as follows:

<input type="checkbox"/> 07-01	Actual date (MM-DD) – If checked, pressing any button described below causes selecting all characteristic stations, even those already read.
	Modem – automatic connection. Selects all stations which don't need your attention and can be read automatically.
	Modem – hand connection. Selects all stations which might need your attention. Those stations have extension number or
	Cable connection – selects all stations connected via internet
	Delete – clears selected stations

Between the MAC address and the name of the station there is a last transmission marker. There are 3 possibilities:

=	Amount of days since last transmission is under a preset value (1 day at default). After that time the marker changes into tilde "~". If you want to change the default value you need to go to Print out/Missing measurement
~	Amount of days since last transmission is over a preset value but less than 30 days.
©	Amount of days since last transmission is over 30

Under the list of gas stations there is a drop down list of data bases. This is an easy way of choosing a group of characteristic gas stations gathered inside one directory. To add a new group enter **File/Groups data/Add group data**.



Center part of the main window is intended for the information about the date . Quite important elements are two clocks which show two times

Computer time 10:02:43 09:02:43 Official time

The left one shows present computer time. Clicking the clock you can change computer time (as long as you have necessary privileges given by the administrator of your computer network). The other one shows official time taken from one of the government websites. Clicking this clock you can connect with a website and get official time. As I wrote before time is very important. TIME = MONEY. More information about time is in the chapter 4.6



4. CONNECTION WITH THE CORRECTOR.

4.1. Auto-connection.

In case we have a computer connected locally with a corrector there is a possibility of gaining connection automatically. To enable this function you need to create a shortcut to GMWin and in command line add Find

C:\Common\gmwin.exe

It doesn't look like a regular command line from Windows XP. The reason is that I am working on Windows Vista Business and the command line looks a little bit different. So, don't bother if you have a different style. I put a standard path to gmwin program, however, you need to find your program wherever you installed it.

On Execution, program will find the address of the station sending a broadcast query of time and using the following parameters: 9600, N, 8, 1 (Baud rate=9600; Parity=None; Data Bits=8; Stop Bits=1). After establishing a connection the program receives the address of the corrector and automatically picks it up from the list. If the received number is not on the list a window with station parameters is opening.

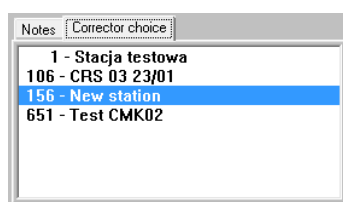
Configuration of transmission parameters.

To configure the parameters of the station you can hit **Station parameters** button in main window or **Options/Station parameters**. This window appears.



Picture 2: Configuration of transmission parameters (Modem connection)





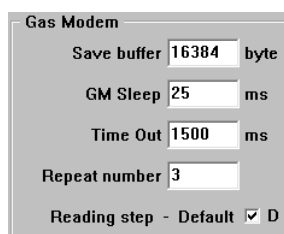
Upper left corner of Station Selection contains two tabs: *Notes* and *Corrector choice*. The first one is designed for making notes which will be available on choosing the device. Notes are saved in text files and its content is rather unlimited. *Corrector choice* is designed for gas station selection. List of stations contains Gaz-Modem addresses and stations' names.



Parity control is an easy way of checking the correctness of the transmission. It relies on calculation of bits and setting a control bit of "1" if the number of "1s" in the frame is odd or "0" if the number of "1s" in the frame is even. Thus you can set among even, odd or none if you don't want to use parity.

RTS (Request to Send) – if DTE (Data Terminal Equipment – PC, Laptop, terminal) broadcasts this signal, it is ready to transmit data to DCE (Data Communication Equipment (usually a modem). RTS circuit can be set to on, off, hs – handshake (negotiation), tg – toggle

DTR (Data Terminal Ready) – signal means that DTE is ready. DTR should be on during the transmission.



This window contains information essential for correct transmission.

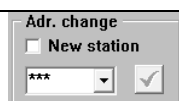
Save buffer – buffer of COM port in bytes. Often during instabile transmission you can set a small value what causes saving data more often, however, extends the time of readout.

GM Sleep – minimum time between the last bit of previous frame and the first bit of the next frame in milliseconds.

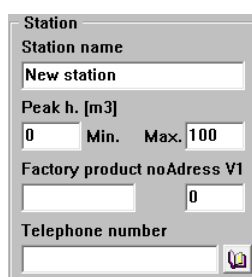
Time Out – a specified period of time that will be allowed to elapse in a system before a response is supposed.

Repeat number – if the program gets no response it will send the number of repetitions and finally show the alert.

Reading step – manual setting of samples read in one frame at once. If default if enabled the setting look like on the picture. If default is disabled you can enter your value between 1 and 255.



Address change can either change gas station address or add new station (with New station box checked).



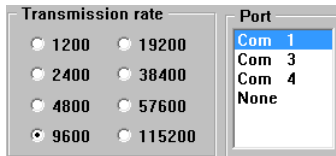
Station name field contains denotation of the station you consider the best to discern among others. Some examples: CRS-03 26/05 – contains the name of the device on the station and date of first readout, Lodz, AX-23 – stands for the name of the city and the region.

Peak hour is connected with minimum and maximum ordered power. Given value is obligatory for every day. In GMWin program those values are used only for visual purposes, to give you a notion about the gas consumption.

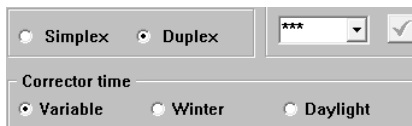


Minimum and maximum values are marked on the diagram with yellow line. If you don't enter any values option is disabled.

Serial number. At the beginning leave it blank. After the first readout program will fill this window automatically. If the number on the front plate is different than the number in the program you will be noticed



Check the transmission rate and COM port in case of using serial transmission. If the data base contains a port number which currently doesn't exist None is active. This situation may happen after reinstallation of the system or changing hardware configuration. Transmission rate window disappears when option Internet is checked (on the right side of the main window)



At default Duplex mode is checked. When Simplex mode is checked TAPI functions cannot be applied.

In Corrector time box you choose among Variable, Winter and Daylight time. Winter stands for a winter time for the whole year. Likewise Daylight. Variable means that time will change from Winter to Daylight on Spring and from Daylight to Winter on Autumn. Options are essential to avoid continuous tries of computer to set proper time.

4.2. Phone number.

In case you have a station with PSTN line you need to specify some parameters of a dialup modem. There are several ways to put the number right.

@PL331234567;123

Extension number. If the modem is connected to the internal telephone exchange, right after the answering machine answers the 123 number is dialed.

; – program is holding for the reaction of the user .

, – modem is holding a certain amount of time defined inside the modem software. You can put several commas to lengthen this time. This mark should be used only when you are sure of the receiver reaction (no one will pick up the phone)

> – Modem dials the number to the mark. When connected a notice appears to pick up the phone and ask the operator for the connection or manually dial the remain part of the number.

Local phone number

Dialing code

L – Long distance operator. Sequence of digits which must be dialed before dialing code is taken.



Option available in Modem/Init Modem menu

P – pulse dialing

T – tone dialing

Disable the number. If you perform a local readout without connecting via PSTN line block dialing with this mark.



4.3. Data transmission via Internet.

A little bit of history

Internet is a worldwide, publicly interconnected computer networks using IP (Internet Protocol) protocol. Its beginning derives from ARPANET (Advanced Research Projects Agency Network) developed by ARPA of the United States Department of Defense created in early 60s. ARPANET was the first packet switching network. Now, this technique is the dominant basis for both data and voice communication worldwide. With packet switching, a system can use one communication link to communicate with more than one machine by disassembling data into data graphs, then gather these as packets. Not only could the link be shared, but each packet could be routed independently of other packets.

Since then Internet is continuously evolving into newer, faster and more accessible network. Its easiness in use, cost-effectiveness as well as versatility makes it the most popular media in the world.

This benefit found also a reflection in gas and oil industry. After almost 50 years since first transmissions on ARPANET we can complete remote readouts via Internet. However, having Internet connection doesn't mean that we have to quit dialup networks. Although it is older and slower way of connection it has several pros over the Internet which are not in the scope of this manual.

Concept of Ports, Protocols and IP addresses

TCP is the most commonly used protocol on the Internet. The reason for this is because TCP offers error correction. When the TCP protocol is used there is a "guaranteed delivery." This is due largely in part to a method called "flow control." Flow control determines when data needs to be re-sent, and stops the flow of data until previous packets are successfully transferred. This works because if a packet of data is sent, a collision may occur. When this happens, the client re-requests the packet from the server until the whole packet is complete and is identical to its original.

UDP is another commonly used protocol on the Internet. However, UDP is never used to send important data such as web pages, database information, etc; UDP is commonly used for streaming audio and video. Streaming media such as Windows Media audio files (.WMA) , Real Player (.RM), and others use UDP because it offers speed! The reason UDP is faster than TCP is because there is no form of flow control or error correction. The data sent over the Internet is affected by collisions, and errors will be present. Remember that UDP is only concerned with speed. This is the main reason why streaming media is not high quality.

Port can be easily explained with an analogy: think of IP addresses as the street address of an apartment building, and the port number as the number of a particular apartment within that building. If a letter (a data packet) is sent to the apartment building (IP) without an apartment number (port number) on it, then nobody knows who (which service) it is for. In order to the delivery to work, the sender needs to include an apartment number along with the address to ensure the letter gets to the right domicile.

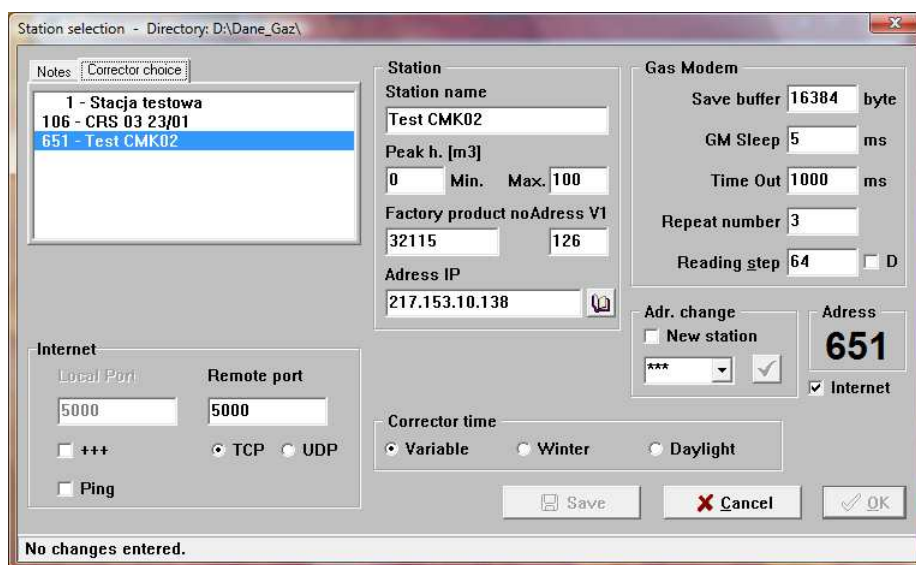


Because there are millions of virtual places in the Internet every computer must have its own, unique number – IP address. When information is sent over the Internet to your computer, it accepts that information by using TCP or UDP ports.

Summarizing, let me give you an example. Everyone surfs the Internet every day visiting many web pages. As you probably know web pages are located on web servers which are simply computers running an application that allows other computers to connect to it and retrieve the web pages stored there. In order to a web server to accept connections from remote computers, such as yourself, it must bind the web server application to a local port. It will then use this port to listen for and accept connections from remote computers. Web servers typically bind to the TCP port 80, which is what the http protocol uses by default, and then will wait and listen for connections from remote devices. Once a device is connected, it will send the requested web pages to the remote device, and when done disconnect the connection. On the other hand, if you are the remote user connecting to a web server it would work in reverse. Your web browser would pick a random TCP port from a certain range of port numbers, and attempt to connect to port 80 on the IP address of the web server. When the connection is established, the web browser will send the request for a particular web page and receive it from the web server. Then both computers will disconnect the connection.¹

Applying ports and IP addresses concepts to GMWin program

For a proper configuration of Internet connection you just need to know a couple of aforementioned information, namely IP address and remote port number.



Picture 3: Configuration of transmission parameters (Internet connection)

¹ For more information check the last chapter Glossary.



To start the whole procedure you need to check the Internet check-box under the Gaz-Modem address. If you don't have this option you probably don't have an Internet connection. Now you have a window similar to the picture 3. Some changes appeared, as you see. Now in the place of telephone number you can put IP

Internet

Local Port: 5000 Remote port: 5000

☒ +++ ☒ TCP ☐ UDP

☒ Ping

Internet

Local Port: 5000 Remote port: 5000

☒ Duplex ☐ TCP ☒ UDP

☒ Ping

address. Moreover, instead of Transmission rate section there is Internet section with type of transmission and remote port number. In case of transmission type is TCP there is available check-box named '+++'. It is applicable when using CMT/GSM-01 Data Transmission Module. During GPRS connection this box makes you sure that the session will be finished. Ping checks the connectivity before the session is established. However, the echo-reply (ICMP packet is a reply for echo request) can be blocked by some network administrators. It is connected with POD attacks (Ping of Death) which involves malicious ping to a

computer. Sometimes the attacker can also try to overwhelm the victim with ICMP packets. The attacker hopes that the victim will respond with ICMP Echo Reply packets, thus consuming outgoing bandwidth as well as incoming server bandwidth. This kind of attack is known as DoS (Denial of Service). So, don't worry if pings don't work. Try to connect anyway. If you select UDP type of transportation '+++' changes into Duplex. There are 2 ways of connection in UDP type: Simplex and Duplex.²

Transmission itself

Before starting the transmission you need to choose the type of data to read. To do it, choose **Read out** in main window. All possibilities are itemized. Ticked options will be read.

Read out

☒ Plate

☐ ASCII

☐ Range

☒ Vb

☒ Vm

☒ Qb

☒ Qm

☒ P

☒ T

☐ dP

☐ Res 1

☐ Res 2

☐ Res 3

☒ Event

Plate – Name plate

ASCII – Name plate in ASCII code (this option is no longer used)

Range – Minimum and maximum values of measurement transducers

Vb – 24-hour counters in base conditions (used to be Vn)

Vm – 24-hour counters in measurement conditions (used to be Vr)

Qb – Base stream

Qm – Measured stream

P – Pressure

T – Temperature

dP – Difference of pressures in orifice gas meter

Res 1 – 1st reserve

Res 2 – 2nd reserve


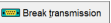
Res 3 – 3rd reserve

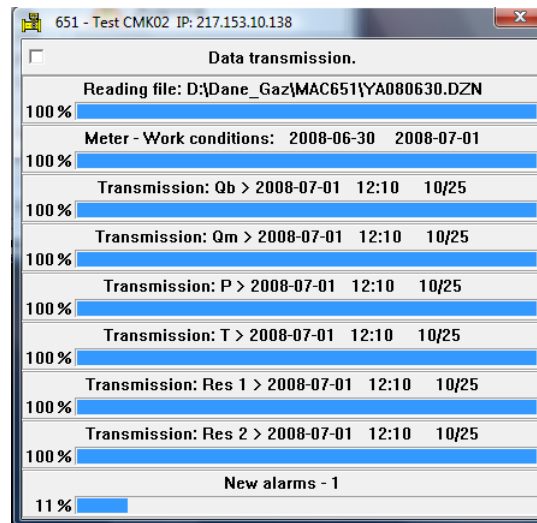
Event – List of events

For a new created gas station all check-boxes are checked except ASCII. You can manually choose desired options, however, to select all of them click the title of the window. Settings referring check boxes are saved in ini file appropriate for the station. To start the transmission

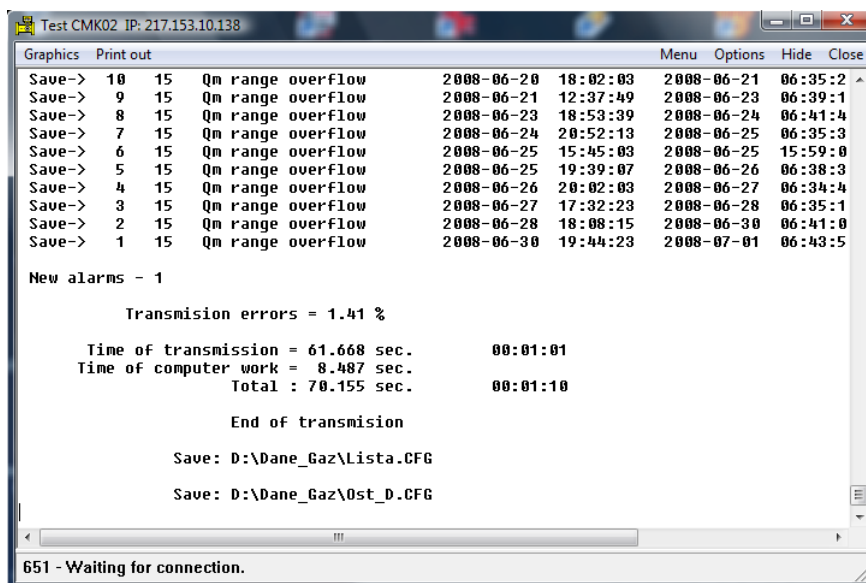
² For more information check the last chapter Glossary.



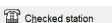
click  button. You can also find the equivalent of this button in **Readout/Transmission** menu. Last option is to double-click the desired gas-station. In new window all messages appear consecutively. You can also cancel transmission any time with .



Picture 4: Window showing the progress of the transmission



Picture 5: Window showing all data sent during transmission in text format


If you are connected via dialup network right before transmission a modem is connecting with the selected number. For automatic readouts there is another function called Checked stations . Be aware that program is working in loop until it finishes all readouts. So if some connection is established but transmission cannot be finished it will be reestablished until full success. This way you are exposed to high costs of transmission (if you don't monitor the whole process). On internet connection it doesn't matter.

If you check at least 2 stations with exactly the same parameters button Checked



stations changes into   TL48345678... button where:




 TL48345678...

Two buttons appearing only when you selected at least two gas stations with the same parameters (COM, RTS, DTS



All remote modem transmissions. Readout of all selected stations.

 TL48345678...

Shows common phone number. Calls the number partly shown on the button to read several gas stations.



4.4. Transmission errors

If we start discussion about transmission errors we need to introduce some terms first. One of the most important is BER – Bit Error Ratio which is generally connected with digital transmission. BER is the number of erroneous bits received divided by the total number of bits transmitted. The concept of BER is ubiquitous and usually used in industry as the fundamental measure of performance for digital communication systems. It is connected with QoS – Quality of Service which nowadays is crucial and most wanted parameter. QoS, connected with control mechanisms, is the ability to provide different priority to different applications, users, or data flows, or to guarantee a certain level of performance to a data flow. There are many methods of improving QoS, however, they are Beyond the scope of this manual.³ Important is fact that you must be aware of real conditions of the measurements.

Usually when we face some errors with transmission to directly connected hardware the problem lays in wrong configuration of our computer or connected device. A common mistakes are setting wrong COM port, transmission rate and gaz-modem address or too short time-out. Our recommendation is using hardware ports instead of software simulated and lower transmission rate to 9600bps.

If the environment surrounding the measurement devices is highly jammed with signals from other electrical equipment (inverters, engines, generators) we suggest to separate those circuits from gentle measurement appliance. Long cables lying in the vicinity of inverters may infer with in the air disturbances.

Phone connections are often the subject to failure. Apart from wrong configuration there are old cables prone to telephone hearing and interference which you cannot influence (more and more often copper/aluminum cables are replaced with fiber optics). Sometimes converters RS-Ethernet help but we cannot consider this as a "remedy". Always important is the phase of testing the connection and performing many scenarios which may appear before installation the whole system in the destination point. Invoking some situations may unveil vulnerabilities of the configuration. With indirect connections you should be on the alert. Your attention and action on time is required to finish transmission successfully.

4.5. A word of the truth

Times when there was no dialing tone or you had to order an international connection are irretrievably gone. Good for us! No wonder that we tend to have connections faster, more reliable, more versatile and, last but not least, cheaper. There is an enormous request for cost effective, expandable, manageable networks with "susceptible" to new features and services. With newest technologies we can have IP phones, VoIP, Video Streaming and many more. In comparison to those

³ For more information check the last chapter Glossary



solutions and their “hunger” for throughput⁴ regular readouts out gas stations seems to be just one tooth in the gear. However, there are still somewhere dial-up lines with 56 kbps (kilobits per second – never kilobytes!) bandwidth. Difference between T1⁵ line and dial-up connection is... obvious. Thus, you can read your gas station when you want and as many times as you want. How often should you do it? It is completely up to you. I would say once a day is enough, but if you have huge gas consumption then real time monitoring is necessary with appropriate SCADA⁶ system. But that's a different kettle of fish.

Automatic transmission is... comfortable. One click and it goes on. And that the way it should be done. We pursue to automate every process nowadays, to detect, fix and write errors in logs, to initiate and finish connections, to monitor stations and finally to create final reports. Sometimes this process needs your attention which somehow keeps you locks you to the computer. Improving all aspects of the connection (hardware, line, protocols, software, firmware, etc) makes the reliability higher and your confidence deeper.

Reading step

Using dial-up networks sometimes it's necessary to correct a reading step. Practical interpretation of this parameter is amount of samples sent in one frame. If a frame is lost or corrupted it must be resent what disorganize the transmission. If your connection is poor it is a good practice to lower the reading step. Option is available in Station parameters (described in chapter 4.1)

Time out

Quite often there is a need to increase a time out⁷ - a time between sending an inquiry and receiving the answer. A default value is set to 1500ms. Although the connection was established and everything seems to be perfect, program may show you an alert that it cannot establish connection and disconnect the session. A few events like that every day and be sure that your invoice for phone connections is considerably higher. Our recommendation is to use the following values of time-out: 500-2500ms for internet connection, 3500-4500ms for GSM and modem connections and 10000-35000ms for GPRS session. For modem connection you can also set a time delay of sending the first inquiry. Go to Modem/Modem start time and change default value of 3000ms, if necessary.

GM Sleep

This timer is responsible for a minimum time delay between receiving the last frame and sending the next one. This parameter is essential during simplex connection like RS-GA22 or RS-485. During duplex transmission this parameter is not applicable.

Repeat number

⁴ For more information check the last chapter Glossary

⁵ For more information check the last chapter Glossary

⁶ For more information check the last chapter Glossary

⁷ For more information check the last chapter Glossary

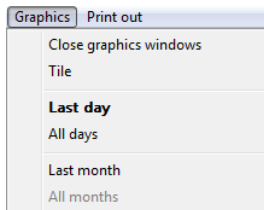


If a corrector sends an inquiry and doesn't receive an answer after a specified time-out it will repeat that activity until it reaches the repeat number. If there is still no answer then a notice appears demanding a user action. Repeat number is set to 3 by default.



4.6. Graphic imaging of data

Registered data can be represented on diagram. To do it press Graphics on main menu. To show a diagram referring to the certain day, first check the day and the month. If you want to see all days from the beginning of the month just press Graphics. Other functions are listed below.

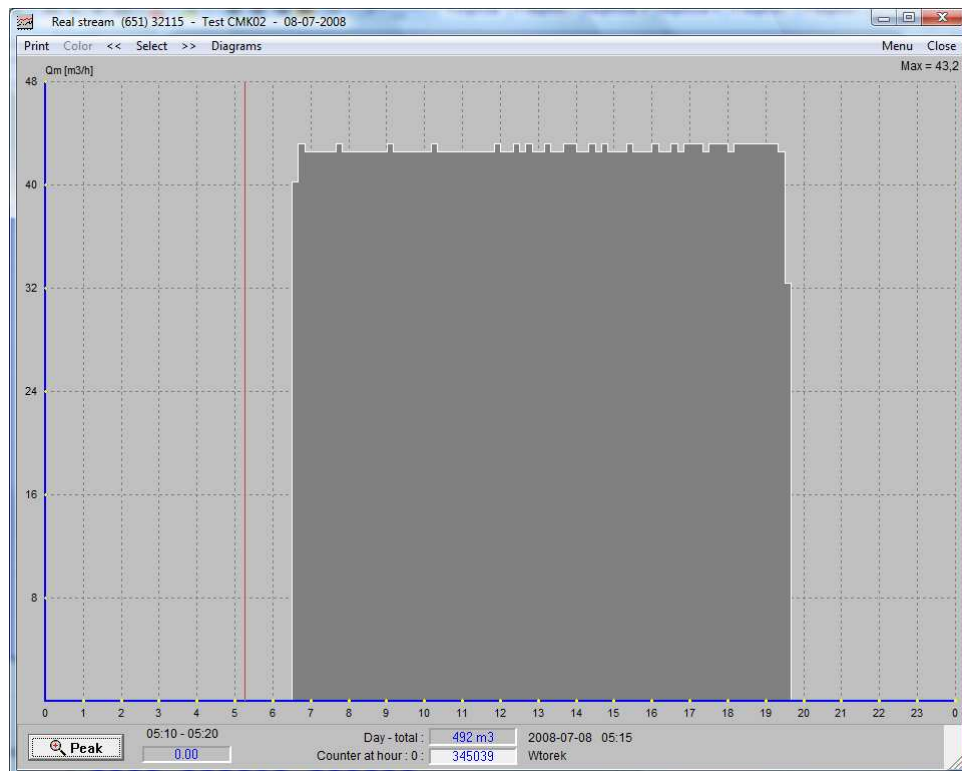


Close graphics windows	Closes all diagrams
Tile	Organization of the screen into mutually non-overlapping frames
Last day	Shows the diagram with the last day data
All days	Shows window offering the choice of the day. When you pick the day proper window appears.
Last month	Shows a histogram with a number of day consumption bars with the reference to the whole month. Colors of the bars show a level of collected information. Red bar 🚫: no data registered. Flow is calculated as a sum of partial logs. It is highly approximated value which is not a subject to official settlement. Black bar 🖤: discrepancy of the day increase and sum of registered data within that day. Error is set to 1% by default. Blue bar 🟦: Everything is correct. Proper readout. Yellow interior of the bar 🟡: Some lacks appeared, thus readout is incomplete.
All months	Shows window offering

You can always move backward or forward in time with **<< Meter >>** or by pressing 'Home' or 'End' buttons. Easiness of navigation gives you the flexibility of comparing daily consumption and checking the correctness of flow. Clicking the bar lets you scrutinize the consumption in details for everyday. In the Meter submenu **<< Meter >>** there are 2 options: Base conditions and Work conditions. You can present normal or real day flows. It is pretty much self-explanatory.



Double-click one of the bars opens a new window. It contains detailed regarding essential counters and conditions. The following chart and and teble explains all options.



Picture 6: Example of graphical representation of the collected data

Print

Enables printing of the diagram. See also next subsection Data printing.

Color << Select >> Di

- Over the limit
- Limit
- Lower limit
- Default

Sets colors for given options

<< >>

Changes date one day backward or forward

Select >> Diagrams P

- Qb [m3/h]
- Qm [m3/h]
- P [kPa]
- T [°C]
- dP [Pa]
- Res1 [kPa]
- Res2 [°C]
- Res3 [°]

Changes the diagram among given possibilities. Some options are grayed out because they are displayed at present (Qb) or unavailable (reserve 3, dP)

Qb – base stream [m³/h]⁸

Qm – measurement conditions [m³/h]

P – pressure of the gas

T – temperature of the gas

dP – pressure drop of the gas in orifice gas meter

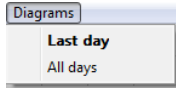
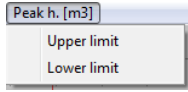


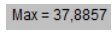
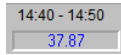
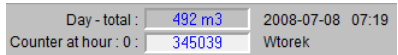
Res1 – 1st reserve

Res2 – 2nd reserve

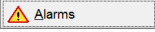
Res3 – 3rd reserve

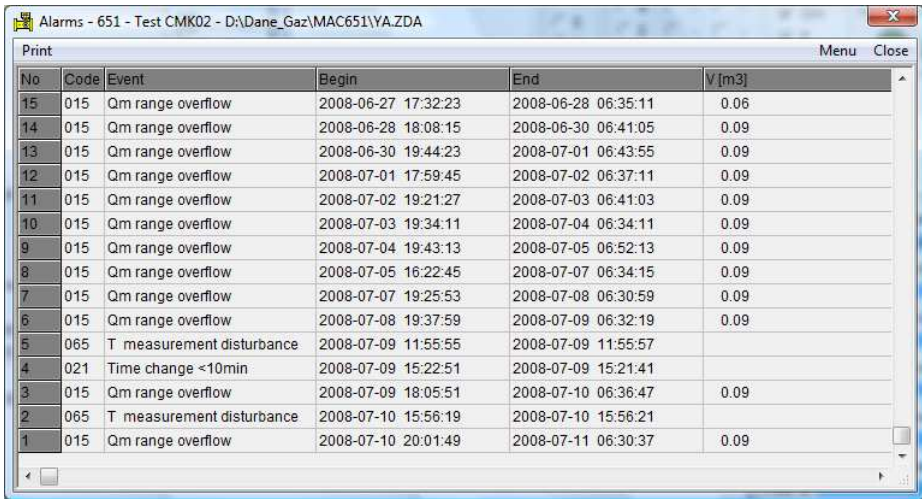
⁸ For more information check the last chapter Glossary



	Last day when the full readout was performed All days opens a window where you can choose a desired date when the readout was performed.
	Available only when Qb chosen. Upper limit – maximum value of the limitation Lower limit – minimum value of the limitation
	Opens a main window of GMWin program
	Closes current window
	Location: just below Close button. Shows maximum value for the chosen diagram. In this case value stands for a Qb = 37,8857 m ³ /h.
	Sample taken between 2:40pm and 2:50pm. Average consumption of Qb = 37.87m ³ /h in this period of time.
	Total consumption in the Jul, 8 th 2008 (Wtorek = Tuesday, name taken directly from windows. That's why it is in national language) is 492m ³ and the value of the totalizer on the gas meter is 345039m ³ at 0:00.

Data printing

Graphical interpretation of data helps you to visualize the consumption of the gas as well as checking any abnormalities in readouts. If you need to print out a particular window we also give you that possibility. In case you notice some disturbance you can open event's window to check it. Press  button in main window.




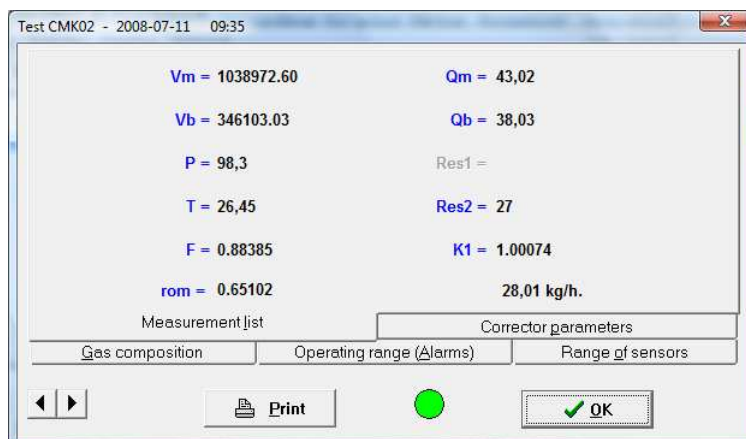
No	Code	Event	Begin	End	V [m3]
15	015	Qm range overflow	2008-06-27 17:32:23	2008-06-28 06:35:11	0.06
14	015	Qm range overflow	2008-06-28 18:08:15	2008-06-30 06:41:05	0.09
13	015	Qm range overflow	2008-06-30 19:44:23	2008-07-01 06:43:55	0.09
12	015	Qm range overflow	2008-07-01 17:59:45	2008-07-02 06:37:11	0.09
11	015	Qm range overflow	2008-07-02 19:21:27	2008-07-03 06:41:03	0.09
10	015	Qm range overflow	2008-07-03 19:34:11	2008-07-04 06:34:11	0.09
9	015	Qm range overflow	2008-07-04 19:43:13	2008-07-05 06:52:13	0.09
8	015	Qm range overflow	2008-07-05 16:22:45	2008-07-07 06:34:15	0.09
7	015	Qm range overflow	2008-07-07 19:25:53	2008-07-08 06:30:59	0.09
6	015	Qm range overflow	2008-07-08 19:37:59	2008-07-09 06:32:19	0.09
5	065	T measurement disturbance	2008-07-09 11:55:55	2008-07-09 11:55:57	
4	021	Time change <10min	2008-07-09 15:22:51	2008-07-09 15:21:41	
3	015	Qm range overflow	2008-07-09 18:05:51	2008-07-10 06:36:47	0.09
2	065	T measurement disturbance	2008-07-10 15:56:19	2008-07-10 15:56:21	
1	015	Qm range overflow	2008-07-10 20:01:49	2008-07-11 06:30:37	0.09

Picture 7: Window containing a list of alarms for a 'Test CMK02' gas station.

This table gives you detailed information about the events registered in the CMK-02 Volume Corrector. Every event is characterized by a code and a name. All events are collected in events.ini file. This file is editable and can be changed according to your liking, however, you must have multilingual version of the program (version made on order). Otherwise option is unavailable. File is available in File/INI files. All other versions of programs have all names inside the program and cannot be changed.



Table with code numbers and events is given in the last but one chapter. If you need to see last measurement click  Last measurement button in main window. The following window appears.



Picture 8: Last measurement window.

As you see several options are available. Some of them are self-explanatory or described above. Thus, I am not going to cover them in this section.

Vm = 1038972.60	Qm = 43,02
Vb = 346103.03	Qb = 38,03
P = 98,3	Res1 =
T = 26,45	Res2 = 27
F = 0.88385	K1 = 1.00074
rom = 0.65102	28,01 kg/h.
Measurement list	

Measurement list gives you details concerning temperature, pressure, streams, volumes, reserves and coefficients. New parameters are:

rom – density of the gas in the measurement conditions

28,01 kg/h – weight of the gas which flowed within 1 hour

K1 – compressibility coefficient

F – correction coefficient

Peak h. [m3]	35	Full day	0
Corrector address	651	Pressure unit	kPa
Serial number	32115	COM 1	
Pipeline diameter [mm]	50	Baut Rate	9600
Orifice diameter [mm]		IRQ	4
Scale of impulse LF [m3]	0,1	Write in period [min]	10
Corrector parameters			

Corrector parameters let you know about the settings of the device as well as basic proprietary information.

metane	97,425	n-hexane	0
etane	0,936	hydrogen	0
propane	0,223	H2S	0
n-butane	0,076	helium	0
i-butane	0	nitrogen	1,216
n-pentane	0,026	oxygen	0
i-pentane	0,025	CO2	0,073
Gas composition			

Gas composition settings are very important for a proper calculation of compressibility coefficient required to estimate base conditions. Gas composition can be changed either in the corrector or via software.

Qmin	15	Qmax	100
Delta Pmin		Delta Pmax	
Pmin	80	Pmax	300
Tmin	0	Tmax	25
res1 min	0	res1 max	0
res2 min	0	res2 max	0
Operating range (Alarms)			

Information about **operating ranges** and alarms can be also found in the corrector.

0,000030977962611 Scales of impulse HF			
P [kPa a]	50	700	600
T [°C]	-50	100	-10
DP1 []			
DP2 []			
R 1 []			
R 2 []			
P At []			
Range of sensors			

Information about the range of sensors.



Increases and decreases fonts



This indicator may be in 3 colors and informs when the station was read out.

Green – under set value (default 1 day)



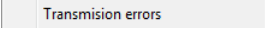
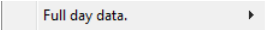
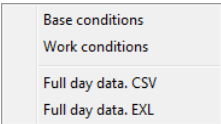
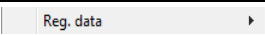
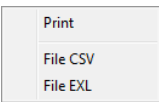
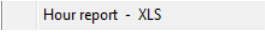
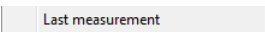

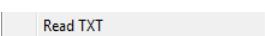
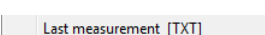
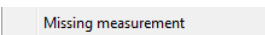
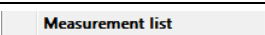


Yellow – over set value but under 30 days

Red – over 30 days

If you want to change the default value you need to go to **Print out/Missing measurement** in the main window.

It is time to say several words about the Print out menu located in main window. As you have probably noticed lots of options are available. Keeping the style and easing out searching relevant information I am going to put everything into table.

	Plate – performs a readout of the plate and shows a result in a result window
	Alarms – performs a readout of all events stored in the station's log
	Transmission errors – shows information about errors in a result window
	Full day data – contains submenu described below
	<p>Base conditions – displays information about base conditions in a result window</p> <p>Work conditions – as before but for work conditions</p> <p>Full day data CSV – generates a report in csv format on the basis of full day data. Three columns contain respectively from left: date, Vm and Vb. One row is one day.</p> <p>Full day data EXL – as before but in excel format and with description.</p>
	Registered data – contains submenu described below
	<p>Print – prints data for a desired day in a result window</p> <p>File CSV – generates a report in csv format on the basis of one day data. Several columns contain respectively from left: date and time, dVb, dVm, pressure, temperature and reserve measurements. No description available in csv format.</p> <p>File EXL – as before but in excel format and with description.</p>
	Hour report – exports data to xls file (Microsoft Excel)
	Last measurement – the same function as  Last measurement in the main window
	Read TXT – performs a readout of ??_chwil.txt where ?? stands for a gas station number. This file contains information about gas composition, momentary measurement data. A result is shown in a result window.
	Shows the last measurement history which is saved in YA_Trans.txt file
	Missing measurement – allows to show windows with missing readouts among stations connected to the computer (certainly, those stations must have been created first on the computer). At first, you are asked to determine the amount of days back to check the missing measurement. After that it shows you small windows with stations in which some measurements are missing. If the window is yellow missing data is included in the period you specified (for example 10 days). If the windows is red the last readout of the station was over 30 days ago.
	Measurement list – shows windows containing readouts



	relevant for every connected station.
Read CFG	Read CFG – opens a small window with the last measurement result.
Program log	Program log – shows a program version in a result window.
Notes	Notes – allows to make some notes essential for a station.



Help/Internet

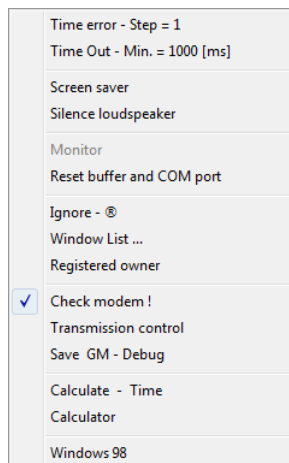
This menu contains personal details of author of this program, version and update options. Moreover, you also find information about this manual as well as installation files. You can update a program either online or downloading installation first.

Options menu

Every day brings us new problems what demand new solutions. Those solutions take effect into new features and find its place in Options menu. Thus, this menu is being developed the most often. Anyway, this menu contains:

Additional options

This menu contains additional options described below



Time error – Step = 1 – If data in corrector has completely different date than actual reading is performed frame by frame.

Time Out – Min = 1000ms – minimum value of time out is 1000 milliseconds (default value). See also glossary

Screen saver – Enables/Disables screen saver (Only when the program is on)

Silence loudspeaker – Enables/disables sounds (Only when the program is on)

Reset buffer and COM port – restarts buffer of COM ports. Useful when ports do not respond.

Ignore ® – When some stations were not read out for over 30 days indicator turns into ®. You can ignore those stations performing next readout checking this option.

Window List – opens a window with information how many and which windows are opened.

Registered Owner – shows information about the registered owner of the system.


Check modem! – checks if modem is available and ready to work. Option sends some AT commands. Should be checked when transmission is via modem.

Transmission control – Indicator which turns new comments to be printed out during transmission. Useful for programmers and everyone who is familiar with programming.

Save GM – Debug – first you are asked to give a name to a new text file where all transmission will be saved. When finished you can check requests and answers between devices. Good option for testing purposes when some parts of a transmission are not received.

Calculate – Time – Simple calculator which converts minutes to seconds



	<p>Calculator – opens calculator (calc.exe)</p> <p>Windows 98 – works under Windows 98. Option improves the speed of gas station's readout.</p>
Put icon on desktop	Self-explanatory.
Internet connection	This menu contains additional options described below
<div> <div>Ask</div> <div><input checked="" type="checkbox"/> Transmission</div> <div>Connect immediately</div> </div>	<p>Options refer to TCP connections only.</p> <p>Ask – before transmission the program prompts if you want to establish connection</p> <p>Transmission – establish connection just before performing the connection</p> <p>Connect immediately – connected all the time</p>
Start the Internet ?	Checks if internet connection is available
Check local network access	Check if local resources are available. Option useful when you have disk mapped and some data is stored elsewhere.
Ping - Check local network	Available only when previous option is checked. Pings mapped disks if available
Time change	This menu contains additional options described below
<div> <div>Computer time</div> <div>Time from internet</div> <div>Time zone select</div> </div>	<p>Computer time – Changes time of the computer</p> <p>Time from the Internet – checks time on reliable website</p> <p>Time zone select – choose your time zone if selected improperly</p>
<input checked="" type="checkbox"/> Flow computer time correction.	If checked and corrector time needs synchronization you will be noticed. Otherwise this parameter will be skipped. In my case, this option is grayed out because I am not allowed to change time on the device I read out.
Time error - How many seconds ? [60]	[60] – Difference of the computer time and corrector time in seconds. If this difference is higher than given time program will notice you to perform a synchronization of time. Available values: from 0 to 255.
Station parameters	The same as  Station parameters
Sum of stations	Description below.



Creates a new virtual gas station where you can add all component flows. Let's consider a situation where you have a major gas meter and several collateral gas meters or quantometers. Potentially, total flow of all quantometers should be equal to the flow of the major gas meter. But, in fact it is just the theory. In real you will never face the situation to have the full compensation. Thus you can create this virtual gas station and make a balance sheet.

Number – gaz-modem address of the virtual station

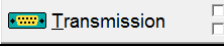
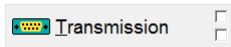
Peak min. – minimum value of the flow

Peak max. – maximum value of the flow

Accounting day – final hour of the accounting day

Station name – self-explanatory

Sum: - all component stations' flows you want to compensate. '+', '-' signs matter!

Find corrector	Looks for a corrector connected somehow to the computer (check all possibilities)
Computer address	Gaz-modem address of the computer. Value is 0 by default and can be changed.
[82] Metre of gas synchronization +/-	[82] – Function no 82 of gas-service protocol. Available only when gaz-service program is installed. You can change the value of Vr counter in the corrector if necessary. If you insert the number without +/- signs this value will be set on the corrector. If you enter a number with a sign this value will be added/subtracted from the current value.
Corrector programming	Opens WService program. First time you open Wservice it enables this option.
Data read out begin control	You can set the beginning date of the readout. The same as the upper checkbox in this button: 
Data read out end control	You can set the finish date of the readout. The same as the lower checkbox in this button: 
Data read out begin control > 45 days	45 days – if the station was not read for over 45 days you will be asked if you are sure that you want to perform reading from starting so long ago. If you confirm your choice you are all set. However, be aware that collecting lots of data may take plenty of time which in case of laptop can cause full battery discharging!

File menu

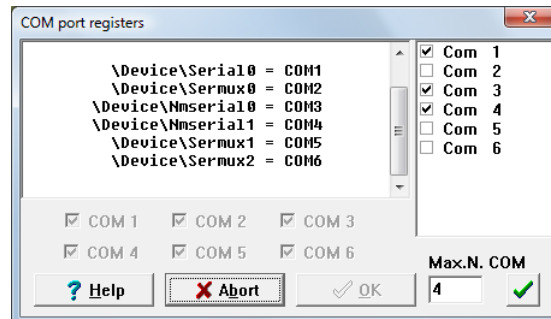
Find - Station name	Allows to find the station by the name when you don't know the GasModem number.
COM list	Opens a new window with COM port information. You can enable or disable unused ports. In the end



	of this table you will find detailed information.
Select Port COM ▶	This menu contains additional options described below.
<div> <div>1 - Com 1</div> <div>3 - Com 3</div> <div>4 - Com 4</div> </div>	1 - Com 1 – chooses all gas stations which are connected to COM1 x - Com x – similarly to the previous statement
Replace Port ...	Opens a new window where you can replace COM port numbers.
[rpo - FIRMA] - INI files ▶	Shows the current user rpo logged into the FIRMA domain. This menu contains additional options described below.
<div> <div>C:\Common\ang\Mac.Ini</div> <div>D:\Dane_Gaz\MAC651\YA_Cfg.Ini</div> </div>	Shows paths to mac.ini and ya_cfg.ini files. You can also open that files from this position. Both files are connected with settings of the stations.
Groups data ▶	This menu contains additional options described below.
<div> <div>Add group data</div> <div>Change name of group data</div> </div>	Add group data – Option useful for people who performs plenty readouts of many stations. Allows to sort stations into groups. Just like you group files into catalogs. Change name of the group data – self-explanatory. Inactive because I don't hadn't created and groups for the purpose of this manual.
Directory - SMS	Specifies a directory where SMS data are stored.
Folder - D:\Dane_Gaz\MAC651	Opens a regular explorer window.
Copy file - last day	Opens a folder with a specified path.
Events list. - Save	Copies data from last day into *.dz_ file
Events list. - Save	Saves present event list in the *.dz_ file and creates a new one. New list has the next, successive number.
Import - files ▶	This menu contains additional options described below
<div> <div>Import data - MAC ▶</div> <div>Pocket PC GMWin CE</div> </div>	This menu contains additional options described below.
<div> <div>MAC651 - Add new</div> <div>MAC651 - All</div> </div>	MAC651 - Add new – you can add new data from outer source (other computer) without interrupting existing data. Only new data are filled. MAC651 - All – copies all data from outer source. Overwrites existing files.
Export - files ▶	This menu contains additional options described below.
<div> <div>Select drive</div> <div>Pocket PC GMWin CE</div> </div>	Select drive – self-explanatory
<input checked="" type="checkbox"/> Data base indexing	Speeds up reading information from data base.
Index rebuild	Self-explanatory



Shut down computer	Self-explanatory
Exit	Self-explanatory



Picture 9: COM port register. Shows available ports and their state.

If you want to check information about installed ports in your system you can do it in the system register. To do it, open `c:\windows\regedit.exe` and find the following section:

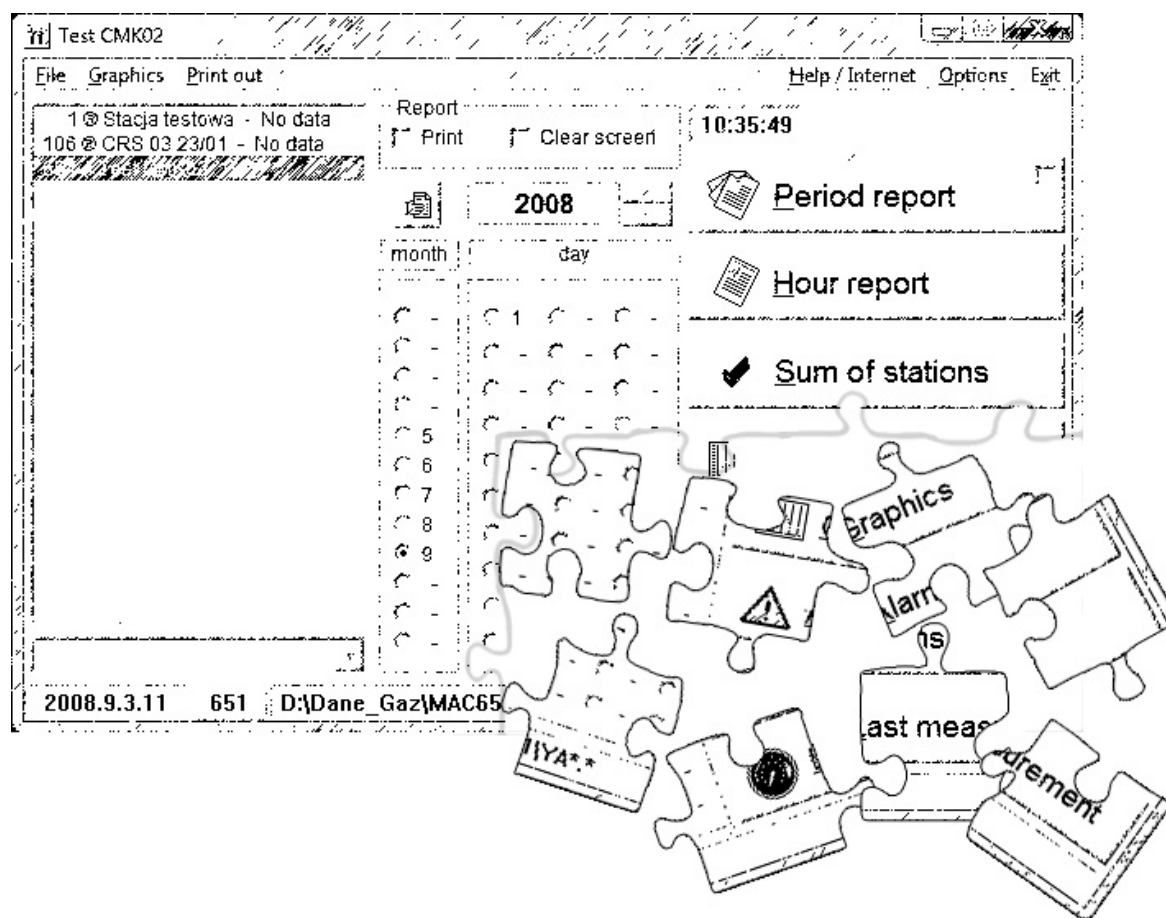
`Computer\HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\LOCALCOMM.`

IMPORTANT!

If you are not familiar with the register settings DO NOT make any changes! Your system may become unstable. Moreover, you can even lose your data!

Left window is a result of register content considering actually installed COM ports. As you see some of them are disabled (COM2, COM5 and COM6) – right window. Below you can enter a maximum port number which will be checked by a program. When finished, press





GM Data View

Abstract:

This program is designed to glance through the measurement data as well as to show their graphical representation. GM Data View is a part of a GMWin program, however, it doesn't contain transmission procedures. It's main purpose is drawing up all kinds of reports and for better understanding showing results in graphs with printing options. All operations on data are only in read-only mode.



5. BEGINNING

This program is designed to glance through the measurement data as well as to show their graphical representation. GM Data View is a part of a GMWin program, however, it doesn't contain transmission procedures. It's main purpose is drawing up all kinds of reports and for better understanding showing results in graphs with printing options. All operations on data are only in read-only mode.

If you want to use this program I am more than sure that you are familiar with GMWin. Thus, interface will not bother you. Convention is pretty much the same. Anyway, if you find some parts of this manual unclear or have some difficulties with described activities, don't hesitate to inform us. We are continuously working on the quality of our services and the simplicity of reaching to all information.

5.1. A little bit of confusion

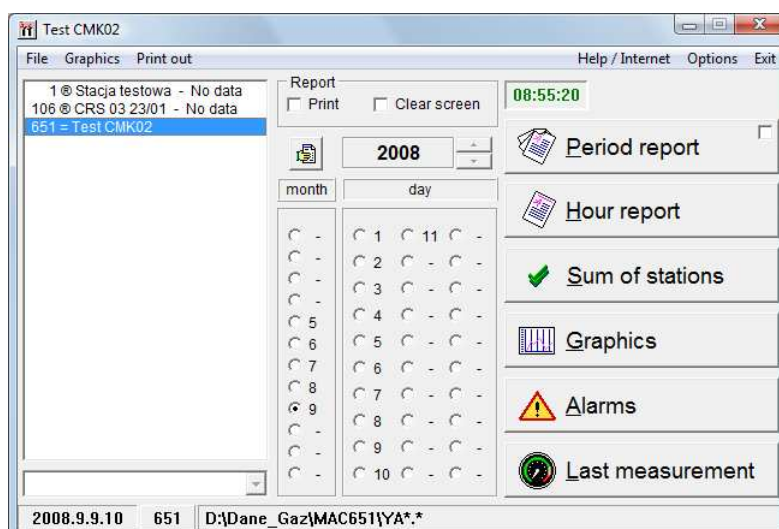
Probably you have already noticed that every program has 4 different names. The first one is the name of the program itself: GM Data View. The next one is the name you see in the taskbar: GAS NET. The third one is the name of the file: Mac_Net.exe and the last one is the name on the icon: GM Data View. WOW! Yes, I am amazed, too. Why so many names? I have no idea. I assume it's just the way it is. Nevertheless, please be aware how it's built. I am going to use the name used with the shortcut on your desktop: GM Data View.

6. DATA PRESENTATION

6.1. Main menu

A layout of GM Data View is pretty much the same as GM Win. Some options have the same functionality and are placed exactly as in the GM Win. I am going to explain them once again to avoid unnecessary scrabbling.





Picture 10: Main Window of GM Data View.

Most of that view is already well-known to you. However, main changes we can mention is just one clock, 2 checkboxes in **Report** field and different names of the buttons. If you forgot what the others mean please click here: [Main Menu](#).

6.2. Graphic presentation of data

Process of presenting data is about the same as in GM Win. As in the previous program you need to use **Graphics** option.

6.3. Reports

To perform a graphic data representation use menu **Print out | Report**. For better understanding, I do prefer to put everything in a table. A print out menu contains the following topics:

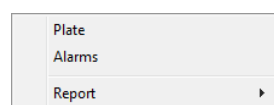
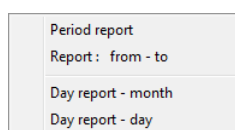


Plate – shows a name plate of the connected device.

Alarms – shows a list of alarms from the connected device

Report – This menu contains additional options described below



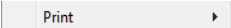
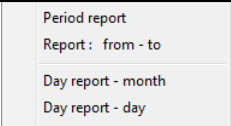



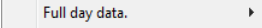
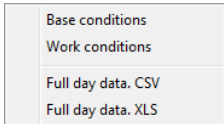

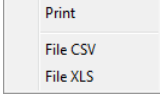
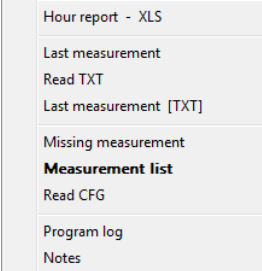
Periodic report – this option opens a window where you need to choose a beginning and end date. A periodic report is shown in the result window.

Report: from - to – creates a report where you need to specify a beginning and finishing date.

Day report - month – Creates a detailed report of the month where every row corresponds to one day

Day report - day – Creates a detailed report of the whole day where every row corresponds to every



	hour
	This menu contains additional options described below
	As above but additionally chosen report is being sent to the printer.
	This menu contains additional options described below
	<p>Report TXT – saves a report in the text file. When asked whether print data, answer yes.</p> <p>Report CSV – saves a report in csv format</p> <p>Report XLS – saves a report in Excel format</p>
	Left margin – sets wider left margin in case some printers cut off some text.
	This menu contains additional options described below
	<p>Base conditions – shows collected data from the selected month in the result window</p> <p>Work conditions – shows collected data from the selected month in the result window</p> <p>Full day data CSV – saves a report in csv format containing date, base conditions value and work conditions value</p> <p>Full day data XLS – as above but in Excel format</p>
	This menu contains additional options described below
	<p>Print – shows collected from the selected day in the result window</p> <p>File CSV – saves a report in csv format</p> <p>File XLS – saves a report in Excel format</p>
	<p>Hour report - XLS – in the result window you'll receive as many tables as days in the month. Every day is divided into 24 rows containing all necessary data. Finally saves tables in the Excel format.</p> <p>Last measurement – opens a new window with several tabs available. Printing is available</p> <p>Read TXT – pretty much the same as the previous function, however, information is presented in text format.</p> <p>Last measurement [TXT] – evokes all measurement information gained during last read out. Available in the result window.</p> <p>Missing measurement – in case you miss some data you can reconstruct the database with some particular values.</p> <p>Measurement list</p> <p>Read CFG</p> <p>Program log</p> <p>Notes</p>



Measurement list – shows windows containing readouts relevant for every connected station.

Read CFG – opens a small window with the last measurement result.

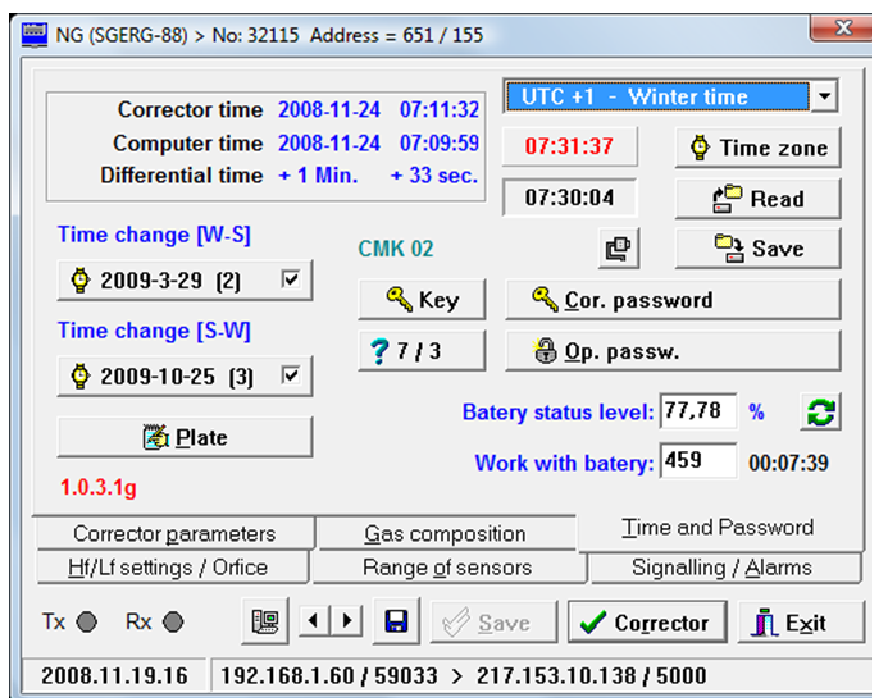
Program log – opens result window

Notes – self-explanatory

6.4. Options

This submenu is moved from GMWin program except **Ordered Power [m3/h]**. Useful to change the amount of ordered power for selected station. More information in section: Connection with the Corrector p. 10





Gas Service

Abstract:

This program is designed to set all parameters necessary for the proper measurement. Gas composition, range of sensors, alarms, battery level and more corrector parameters can be changed only by a authorized staff. So it is very important to keep the access to this software in a secure place. Moreover, any modification is saved in the log taking into consideration

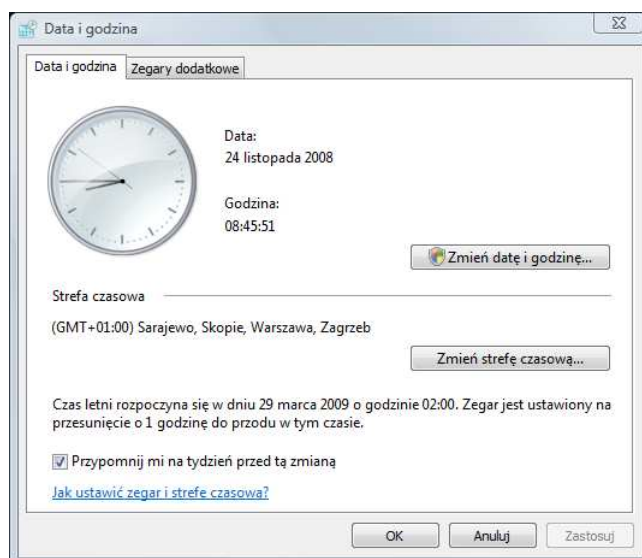


time, date and operator data. It is very powerful tool which should be used with care and moderation.



7. BEGINNING

The first window you may encounter is connected with the time correction. This is a regular Windows' window. However, be aware that time is usually synchronized with the time server in your domain. If you have a local machine time is usually synchronized with global time servers. Anyway, you must have administrator privileges to change system time. And probably you already know, that your network administrator is unwilling to give you this privilege.



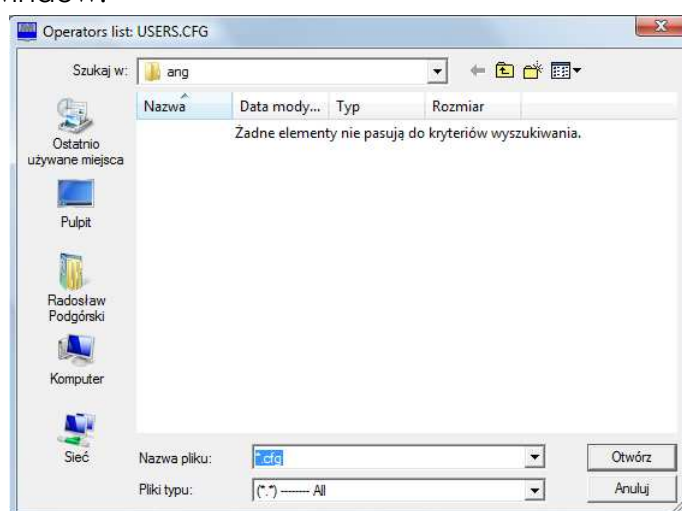
This window is in Polish because I work on Polish version of Windows Vista Business system. Your Time and Date window can be different what will not affect the change of time. When you are done with system time and make sure that it is correct, you have a local time standard.

Next step is choosing a group of data. I have just three of them and this tutorial is based on group 02 – TB Tests-Server.

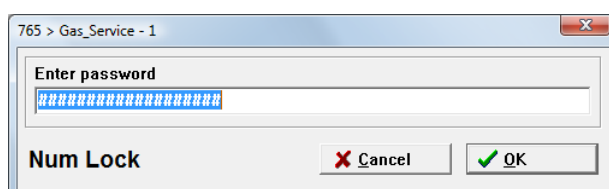




Right after that program checks the file users.cfg where it finds information about authorized users and their passwords. If it doesn't know the correct path you will be noticed with the window.

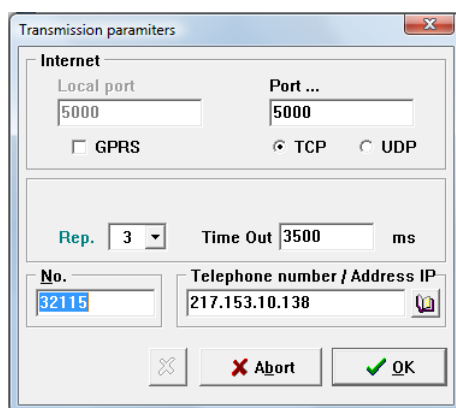


It is recommended to keep users.cfg in the COMMON directory with other configuration files. Afterwards you must enter your password. As I mentioned before, only authorized operators can access the settings of the corrector.



Finally you need to provide transmission parameters which will allow to locate your device. This manual is mostly based on CMK-02 Volume Corrector thus some options are grayed out and edition of those fields is impossible.



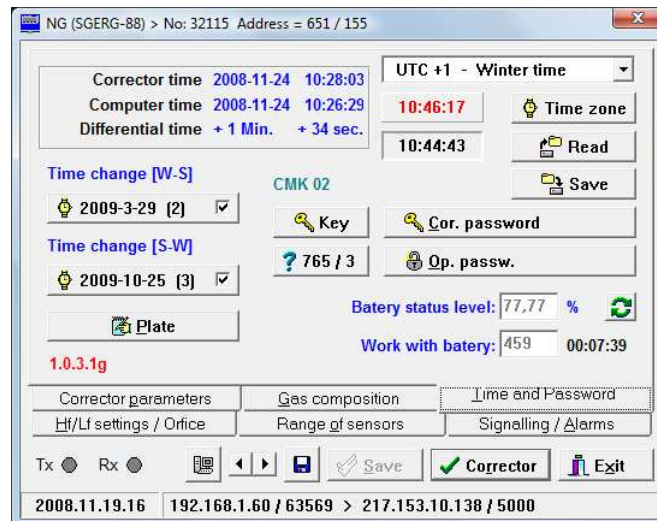


If everything went fine you can feel free to proceed to the next chapter.



8. CRUCIAL SETTINGS

Now you have entered to the main program where all settings are exposed. Almost all settings can be changed. Almost... All settings can be changed only by a producer or authorized companies.

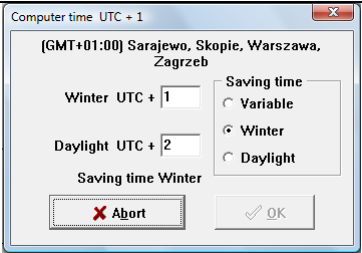

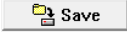


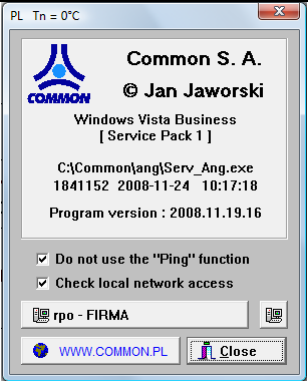






8.1. Time and Password

This chapter considers issues collected on the Time and Password tab

<div> <div>Corrector time 2008-11-24 10:28:03</div> <div>Computer time 2008-11-24 10:26:29</div> <div>Differential time + 1 Min. + 34 sec.</div> </div>	Self explanatory
<div> <div>UTC +1 - Winter time</div> <div>Official time</div> <div>UTC +1 - Winter time</div> <div>UTC +2 - Summer Time</div> </div>	Choose among UTC official time, local time and daylight saving time. Some gas companies require only winter time without any changes thus they don't have any problems when time changes.
<div> <div>Time change [W-S]</div> <div>2009-3-29 [2] <input checked="" type="checkbox"/></div> <div>Time change [S-W]</div> <div>2009-10-25 [3] <input checked="" type="checkbox"/></div> </div>	Shows dates when time changes between winter and summer. Ticks stands for automation of the process.
<div> <div>11:06:13</div> <div>11:04:39</div> </div>	Red clock – CMK-02 Volume Corrector time Black clock – Computer time
<div> <div>Time zone</div> </div>	This menu contains additional options described below






	Self explanatory
	Revokes settings from selected file.
	Saves all settings to the file. Suggestion is 32115.cm2, where 32115 is a serial number, and cm2 is required extension.
	Sends key to the corrector what allows perform changes without opening the battery chamber in the corrector itself. It is an equivalent of a hardware key.
	This button gives you information about the license number of the program (765) and user number (3). Moreover, it contains additional options described below
	This window has a lot of functions. Clicking with a left or right mouse button on every element of this window will give you some information about your operating system and connected device.
	Corrector password. New correctors have an empty password. It means that you should provide empty field (press backspace)
	Operator password. You can change your password here.
	Battery status level can be changed only by a produces as well as time of work with this battery. "Recycle" button is used when changing battery.
 1.0.3.1g	Shows a plate of a corrector. 1.0.3.1g is a current firmware version.

8.2. Gas Composition

This chapter is pretty much self explanatory, however, some details need mentioning. Our software enables several methods of entering gas composition. You can either put full gas composition or just the most important components. It is also possible to



work with mole as well as volume gas composition. There are also some preset gas compositions like GZ50, N9, N43, N48 which are used in common. Nevertheless the first checkbox allows to insert a composition you need. Make sure the sum of all components is 100 without any rest. Otherwise program will find an error and will reject new settings.

Three buttons need mentioning:    Import. The first one is loading ready gas composition from the file, The second one is saving new gas composition. The other one is considered with importing gas composition from the other gas station already created and read under GMWin program.



Gas percentage composition				
Methane	97.425	n-Octane	0	Sum 100 Rest 0
Ethane	0.936	Hydrogen	0	
Propane	0.223	H2S	0	Set GZ50 N9 N43 N48 Set F.
n-Butane	0.076	CO	0	
i-Butane	0	Helium	0	SGERG Ron 0,7365719 Hs 39,87343835 CO2 0,00073304 H2 0
n-Pentane	0.026	Argon	0	
i-Pentane	0.025	Nitrogen	1.216	
n-Hexane	0	Oxygen	0	
n-Heptane	0	CO2	0.073	

Comp.: ☐ Mole. ☒ Volume.

Corrector parameters | Gas composition | Time and Password

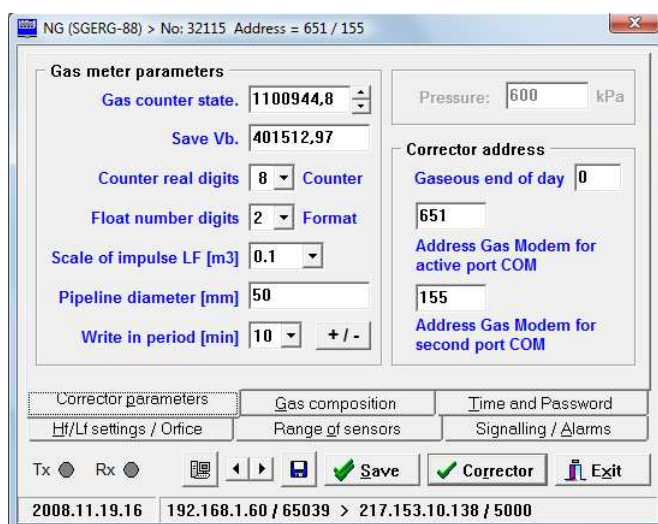
Hf/Lf settings / Orifice | Range of sensors | Signalling / Alarms

Tx ☐ Rx ☐    Save  Corrector  Exit

2008.11.19.16 192.168.1.60 / 65039 > 217.153.10.138 / 5000

8.3. Corrector parameters

This part actually doesn't need any explanation. Nothing unusual or extraordinary is over here.



NG (SGERG-88) > No: 32115 Address = 651 / 155

Gas meter parameters

Gas counter state: 1100944.8

Save Vb.: 401512.97

Counter real digits: 8 Counter

Float number digits: 2 Format

Scale of impulse LF [m3]: 0.1

Pipeline diameter [mm]: 50

Write in period [min]: 10 +/-

Pressure: 600 kPa

Corrector address






Gaseous end of day: 0

Address Gas Modem for active port COM: 651

Address Gas Modem for second port COM: 155

Corrector parameters | Gas composition | Time and Password


Hf/Lf settings / Orifice | Range of sensors | Signalling / Alarms

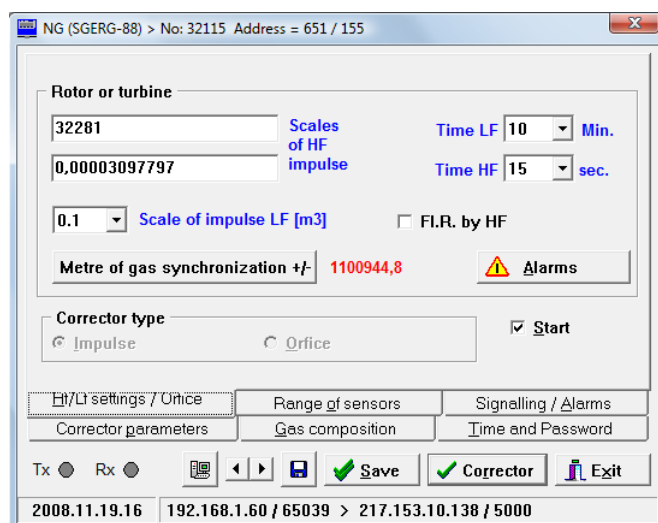
Tx ☐ Rx ☐    Save  Corrector  Exit

2008.11.19.16 192.168.1.60 / 65039 > 217.153.10.138 / 5000



8.4. HF/LF /Orifice settings

<div>32281</div> <div>0,00003097797</div> <div>Scales of HF impulse</div>	Both values are strictly connected with each other and are responsible for the amount of pulses coming from HF transmitter when 1 cubic meter had flown through the gas meter. This value is called HF constant
<div>Time LF 10 Min.</div> <div>Time HF 15 sec.</div>	Those values are responsible for time when the volume is averaged. Being more specific, every 10 minutes volume based on LF pulses is recalculated and saved as an average value. So, after 10 minutes we can make the first estimation of the hour consumption. Every next 10 minutes this estimation is more reliable and closer to the truth. As for the HF transmitter it work in the same way, however, the calculation is run every 15 seconds.
<div>0.1</div> <div>Scale of impulse LF [m3]</div>	This value
<div>Metre of gas synchronization +/- 1100944,8</div>	This button is very helpful when counters on the gas meter and on the corrector have a slight difference. Without stopping all devices we can adjust V_m value on the corrector.
<div><input type="checkbox"/> F.I.R. by HF</div>	Checking this box means that volume is calculated on the basis of HF transmitter. Usually calculations are based on LF transmitter.
<div> Alarms</div>	Just shows alarms
<div><input checked="" type="checkbox"/> Start</div>	This is very slick option. You can either start or stop the CMK-02 Volume Corrector with this checkbox. You do not need to disconnect any cables, just one click and you are all set.





8.5. Range of sensors

	Min.	Max.	Simulation of signals	Unit
PA [Pa a]	INF	INF	101325 <input checked="" type="checkbox"/> PA	Pa a
P [kPa a]	50	700	600 <input type="checkbox"/> P	kPa a
T [°C]	-50	100	-10 <input type="checkbox"/> T	°C
R.1 [kPa a]	0	0	0 <input type="checkbox"/> Res 1	kPa a
R.2 [°C]	-50	70	0 <input type="checkbox"/> Res 2	°C

☒ Gas period reg. change at 0 o'clock Pressure P kPa a

☐ Erase ☐ Prev. Gaseous end of day 0

Hf/Lf settings / Office Range of sensors Signalling / Alarms

Corrector parameters Gas composition Time and Password

Tx ● Rx ● Save Corrector Exit

2008.11.19.16 192.168.1.60 / 52325 > 217.153.10.138 / 5000

As you see on the picture every value has minimum and maximum value, as well as simulation. Min and max values should be set according to the working conditions or values given on the technical plate of the device (like external pressure transducer). Sometimes there is a requirement to simulate some conditions for testing purposes. To do so, you need to check a proper checkbox and insert desired value.

8.6. Signaling/Alarms

Signalization Qb: SMS M-Bus

Signalling - 1.0.3.1j

<input checked="" type="checkbox"/> 1	<input checked="" type="checkbox"/> Contact close	<input type="checkbox"/> Out	5
<input type="checkbox"/> 2	<input checked="" type="checkbox"/> Contact close	<input type="checkbox"/> Out	5
<input type="checkbox"/> 3	<input checked="" type="checkbox"/> Contact close	<input checked="" type="checkbox"/> Out	0
<input checked="" type="checkbox"/> 4	<input checked="" type="checkbox"/> Contact close	<input checked="" type="checkbox"/> Out	1

Operating range (Alarms)

	Min.	Max.
Qb [m3/h]	0	1000
Qm [m3/h]	15	100
dP [Pa a]	INF	INF
P [kPa a]	80	410
T [°C]	10	30
R.1 [kPa a]	0	0
R.2 [°C]	0	0

Hf/Lf settings / Office Range of sensors Signalling / Alarms

Corrector parameters Gas composition Time and Password

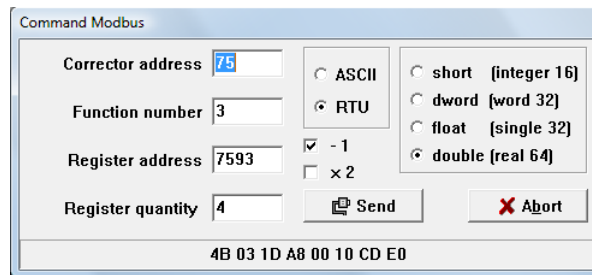
Tx ● Rx ● Save Corrector Exit

2008.12.29.14 192.168.1.60 / 57685 > 192.168.2.138 / 5000

This tab is concentrated on undesirable conditions and notifications. First choose which signalization you want to enable. You've got two possibilities: out3 and out4. On output 1 and 2 there are you can only have alarms considered with two state transmitter (opening or shorting electrical circuit can trigger an alarm. All parameters are described in the manual to CMK-02 Volume Corrector (**Algorithm constants | signalization | OUT4 (O2) output, page 43**).



M-Bus is to test the connectivity of the hardware using modbus protocol. After clicking the button you receive the following window:

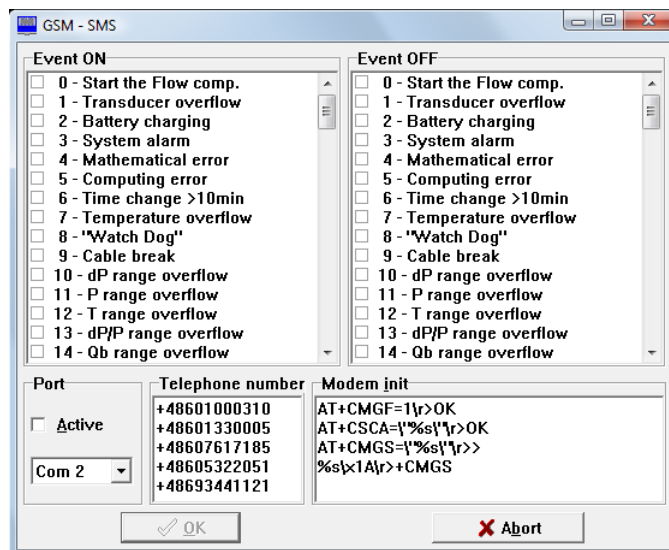


The 'Command Modbus' dialog box contains the following fields and options:

- Corrector address:** 75
- Function number:** 3
- Register address:** 7593
- Register quantity:** 4
- Encoding:** RTU (selected), ASCII (unselected)
- Endianness:** -1 (selected), x2 (unselected)
- Data type:** double (real 64) (selected), short (integer 16), dword (word 32), float (single 32) (unselected)
- Buttons:** Send, Abort
- Hex display:** 4B 03 1D A8 00 10 CD E0

Where, function number is a gas modem protocol number. Function number, register address and register quantity are strictly connected with modbus protocol structure and is not a subject of this manual. If needed you should get the description of the protocol.

SMS button opens new window where you can establish behaviors on the beginning and the end of the events. Active port stands for a port used for sending sms messages. The CMK-02 cannot send a message by itself so it must know where the modem is installed. The beginning sequence of instructions is given in the 'Modem init' box.



The 'GSM - SMS' dialog box contains the following sections:

- Event ON:**
 - ☐ 0 - Start the Flow comp.
 - ☐ 1 - Transducer overflow
 - ☐ 2 - Battery charging
 - ☐ 3 - System alarm
 - ☐ 4 - Mathematical error
 - ☐ 5 - Computing error
 - ☐ 6 - Time change >10min
 - ☐ 7 - Temperature overflow
 - ☐ 8 - "Watch Dog"
 - ☐ 9 - Cable break
 - ☐ 10 - dP range overflow
 - ☐ 11 - P range overflow
 - ☐ 12 - T range overflow
 - ☐ 13 - dP/P range overflow
 - ☐ 14 - Qb range overflow
- Event OFF:**
 - ☐ 0 - Start the Flow comp.
 - ☐ 1 - Transducer overflow
 - ☐ 2 - Battery charging
 - ☐ 3 - System alarm
 - ☐ 4 - Mathematical error
 - ☐ 5 - Computing error
 - ☐ 6 - Time change >10min
 - ☐ 7 - Temperature overflow
 - ☐ 8 - "Watch Dog"
 - ☐ 9 - Cable break
 - ☐ 10 - dP range overflow
 - ☐ 11 - P range overflow
 - ☐ 12 - T range overflow
 - ☐ 13 - dP/P range overflow
 - ☐ 14 - Qb range overflow
- Port:**
 - ☐ Active
 - Com 2
- Telephone number:**
 - +48601000310
 - +48601330005
 - +48607617185
 - +48605322051
 - +48693441121
- Modem init:**

```
AT+CMGF=1\r>OK
AT+CSCA=''\r>OK
AT+CMGS=''\r>>
%s\r1A\r>+CMGS
```
- Buttons:** OK, Abort



This button brings event print out window up.



9. GLOSSARY

Bandwidth

The measure of the capacity of a circuit or channel. More specifically, bandwidth refers (1) to the total frequency range on the available carrier in Hertz (Hz) for the transmission of data, or (2) the capacity of a circuit in bits per second (bps). There is a direct relationship between the bandwidth of an analog circuit or channel and both its frequency and the difference between the minimum and maximum frequencies supported. Although the information signal (bandwidth usable for data transmission) does not occupy the total capacity of a circuit, it generally and ideally occupies most of it. The balance of the capacity of the circuit may be used for various signaling and control (overhead) purposes. In other words, the total signaling rate of the circuit typically is greater than the effective transmission rate. In an analog transmission system, bandwidth is measured in Hertz (Hz). In a digital system, bandwidth is measured in bits per second (bps). See also goodput and throughput.

Base Stream

In flow measurement, volumes are expressed as quantities at base conditions. Base conditions consist of a set, predetermined and well-known chosen absolute pressure and temperature. Base conditions are often defined jurisdictionally. Some examples:

	Absolute pressure	Temperature
Poland	101.325 kPa	0 °C
Canada	101.325 kPa	15 °C
Mexico	1 kg/cm ²	20 °C

See also: Measurement Conditions

BER

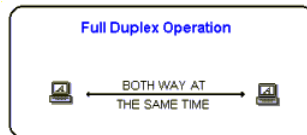
Bit Error Ratio (sometimes referred as Bit Error Rate) is the average number of errors that would occur in a sequence of n bits. If we consider n equal to 1 we think BER as the probability of any bit received in error. Formally BER is expressed in terms of the following ratio:

$$\frac{1 \text{ error}}{n \text{ bits transmitted}}$$

Full Duplex

Data can travel in both directions simultaneously. There is no need to switch from transmit to receive mode like in half duplex. It's like a two lane bridge on a two-lane highway.



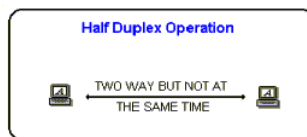


Goodput

The amount of useful data, user data, or payload that can be processed by, passed through, or otherwise put through a system when operating at maximum capacity and received at the correct destination address, minus any packet headers or other overhead, minus any information lost or errored in transit, and minus any duplicate transmissions or retransmissions. Goodput can be thought of as throughput seen by the receiver. Goodput is usually less than throughput, which is always less than bandwidth. See also bandwidth, throughput.

Half Duplex

A half-duplex channel can send and receive, but not at the same time. It's like a one-lane bridge where two way traffic must give way in order to cross. Only one end transmits at a time, the other end receives. In addition, it is possible to perform error detection and request the sender to retransmit information that arrived corrupted. In some aspects, you can think of Internet surfing as being half-duplex, as a user issues a request for a web document, then that document is downloaded and displayed before the user issues another request. Another example of half-duplex is talk-back radio, and CB Radio (Citizens Band).



Measurement Conditions

Flowing conditions (also known as measurement conditions) refers to the temperature and static pressure of the metered substance. The flowing conditions are required data in order to calculate the density of the fluid at flowing conditions. The density of a gas is calculated using the ideal gas law and an equation of state calculation such as the one described in [AGA Report No. 8](#). See also base conditions.

Port numbers

The port numbers are divided into three ranges: the Well Known Ports, the Registered Ports, and the Dynamic and/or Private Ports. The Well Known Ports are those from 0 through 1023. DCCP Well Known ports SHOULD NOT be used without IANA registration. The registration procedure is defined in RFC4340, Section 19.9. The Registered Ports are those from 1024 through 49151 DCCP Registered ports SHOULD NOT be used without IANA registration. The registration procedure is defined in [RFC4340], Section 19.9. All ports from 49152 to 65535 are suggested to be Private/Dynamic ports. A list of registered ports can be found on the [IANA Website](#).

PSTN



Public Switched Telephone Network – international telephone system based on copper wires carrying analog voice data. This is in contrast to newer telephone networks base on digital technologies, such as ISDN and FDDI.

QoS

Quality of Service. In the field of computer networking and other packet-switched telecommunication networks is a set of technologies for managing network traffic in a cost effective manner to enhance user experiences for home and enterprise environments. QoS technologies can be applied to prioritize traffic for latency-sensitive applications (such as voice or video) and to control the impact of latency-insensitive traffic (such as bulk data transfers). A required bit rate, delay, jitter, packet dropping probability and/or bit error rate may/should be guaranteed.

In the field of telephony, quality of service was defined in the [ITU standard X.902](#) as "A set of quality requirements on the collective behavior of one or more objects". Quality of Service comprises requirements on all the aspects of a connection, such as service response time, loss, signal-to-noise ratio, cross-talk, echo, interrupts, frequency response, loudness levels, and so on. A subset of telephony QoS is Grade of Service (GOS) requirements, which comprises aspects of a connection relating to capacity and coverage of a network, for example guaranteed maximum blocking probability and outage probability.

SCADA

Acronym for supervisory control and data acquisition, a computer system for gathering and analyzing real time data. SCADA systems are used to monitor and control a plant or equipment in industries such as telecommunications, water and waste control, energy, oil and gas refining and transportation. A SCADA system gathers information, such as where a leak on a pipeline has occurred, transfers the information back to a central site, alerting the home station that the leak has occurred, carrying out necessary analysis and control, such as determining if the leak is critical, and displaying the information in a logical and organized fashion. SCADA systems can be relatively simple, such as one that monitors environmental conditions of a small office building, or incredibly complex, such as a system that monitors all the activity in a nuclear power plant or the activity of a municipal water system.

T1

Also known as DS-1 or DS1. All terms are often used interchangeably. A broadband, digital, data-transmission system for multiplexing signals over a telephone line, as for voice communication, at 1.54 million bps. E1 is used in place of T1 outside of North America, Japan, and South Korea.

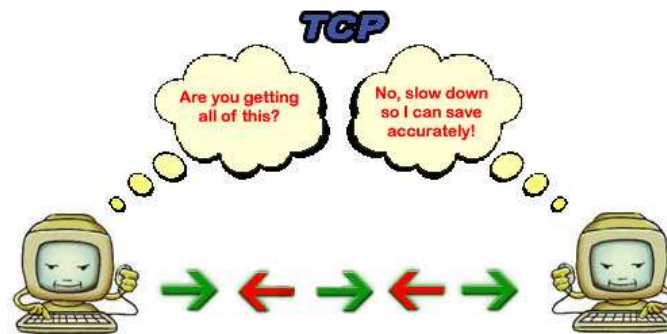
Simplex

Data in a simplex channel is always one way. Simplex channels are not often used because it is not possible to send back error or control signals to the transmit end. It's like a one way street. An example of simplex is Television, or Radio.

TCP



Transmission Control Protocol. Using this method, the computer sending the data connects directly to the computer it is sending the data it to, and stay connected for the duration of the transfer. With this method, the two computers can guarantee that the data has arrived safely and correctly, and then they disconnect the connection. This method of transferring data tends to be quicker and more reliable, but puts a higher load on the computer as it has to monitor the connection and the data going across it. A real life comparison to this method would be to pick up the phone and call a friend. You have a conversation and when it is over, you both hang up, releasing the connection.



Throughput

The amount of useful data, user data, or payload that can be processed by, passed through, or otherwise put through a system or system element when operating at maximum capacity. In this sense, overhead, i.e., signaling and control data, is of no relevance except for the fact that it reduces the payload and, therefore, the throughput. Throughput is always less than bandwidth. In other words, the transmission rate, or data rate, is always less than the signaling rate. See also bandwidth, goodput

Time-out

An interrupt signal generated by a program or device that has waited a certain length of time for some input but has not received it. Many programs perform time-outs so that the program does not sit idle waiting for input that may never come. For example, automatic bank-teller machines perform a time-out if you do not enter your password quickly enough.

Transmission (telecommunication)

Transmission is the process of sending, propagating and receiving an analogue or digital information signal over a physical point-to-point or point-to-multipoint transmission medium, either wired or wireless.



UDP



User Datagram Protocol. Using this method, the computer sending the data packages the information into a nice little package and releases it into the network with the hopes that it will get to the right place. What this means is that UDP does not connect directly to the receiving computer like TCP does, but rather sends the data out and relies on the devices in between the sending computer and the receiving computer to get the data where it is supposed to go properly. This method of transmission does not provide any guarantee that the data you send will ever reach its destination. On the other hand, this method of transmission has a very low overhead and is therefore very popular to use for services that are not that important to work on the first try. A comparison you can use for this method is the plain old Snail Mail. You place your mail in the mailbox and hope the Postal Service will get it to the proper location. Most of the time they do, but sometimes it gets lost along the way.

