

MadCom PC Software

Manual

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1 INTRODUCTION

madCom PC software extends the functionality of madur gas analysers. Among other things, it allows to view the results stored in the analyser, process them (print, prepare charts, etc.) It allows to operate with the analyser remotely (from the PC computer), to view the currently measured results on the PC monitor and to store them directly on the computer to the csv file. madCom software replaces the FGAplus software which will no longer be supported. madCom allows to work with the following analysers:

- GA-20
- GA-20plus
- GA-21
- GA-21plus
- GA-21bio
- GA-40plus
- GA-40Tplus
- GA-60
- CMS-6
- Photon (the first generation)
- CMS-7

2 MADCOM INSTALLATION

The newest version of madCom software is always available to download from madur web-page: <u>http://www.madur.pl/downloadcenter</u>. It is also provided on a CD attached to the analyser. To install the program run the *setup_madCom_v1.1.9.exe* program and follow the instructions on the screen.

3 WORKING WITH THE MADCOM PROGRAM

- After installation, run the program by selecting it from Windows Start menu: Start
 → Programs → madur → madCom.
- madCom software works on following operating systems: Windows 95/98/ME/2000/XP/Vista/7, 32 and 64 bit.
- 3. When having troubles running the program (especially in Windows Vista / 7 64bit), change the *Compatibility mode* of **madCom** program:
- 4. Go to the folder where the program is installed. As a default it is installed in the location: "C:\Program Files\madur\madCom".
- 5. Right-click on the madCom.exe file
- 6. Select Properties, and Compatibility tab
- 7. From the drop-down-list select Windows XP as it is shown in Drawing 1.

Security	Details	Previous Versions
General	Compatibility	Icons
tches that earlie Ip me choose compatibility mod	the settings	
Windows XP (Service Pack 2)	-
ettings		
Run in 256		
Run in 640	480 screen resolution	
Disable visu	al themes	
Disable des	ctop composition	
Disable disp	lay scaling on high DPI	settings
rivilege Level		
🔽 Run this pro	gram as an administrato	r
Change sett	ings for all users	
Chunge sea		

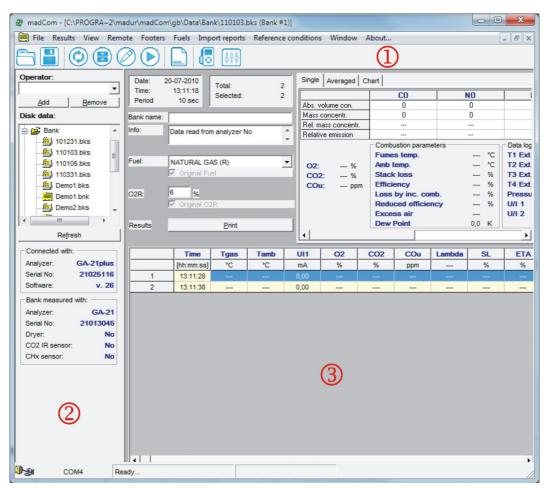
Drawing 1. Changing the Compatibility mode

After running the program the main window appears – it is divided into three parts (shown in Drawing 2.):

① - Quick access bar - chapter 3.2

2 - Navigation bar (Side bar) - chapter 3.1

③ - Data area. This is where are shown: the online measurement results, bak and reports results, graphs, etc.



Drawing 2. Program main window

To start working with the program user must connect with the analyser – Press F8

function key or 🙆 icon from the function bar.

If the COM port is not selected program will open *Communication Settings* window – please see more details in chapter4.1.6

Program's functions and adjustment possibilities are described in the chapters below.

3.1 Side panel

The Side panel is divided into four sections:

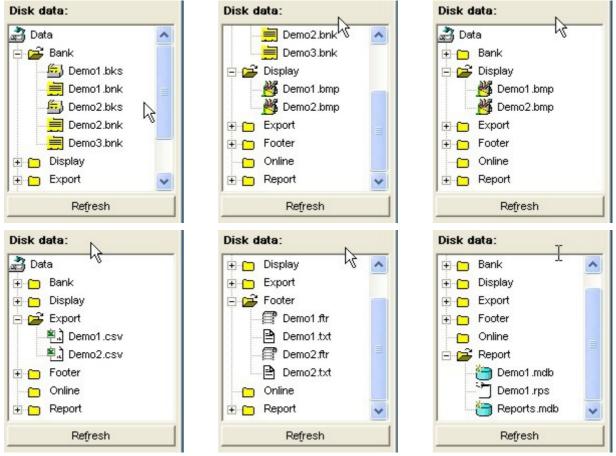
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Onereter	it allows to calcot a upor that currently is working with	the device. It is

Operator – it allows to select a user that currently is working with the device. It is possible to add another user, or delete one of the stored users: keys **Add** and **Remove.**

Operator:	
1013	•
<u>A</u> dd	Remove

Drawing 3. Side panel - Operator

Disk data – allows to view the contents of the Data folder. It gives direct access to the files stored during the measurements. Press Refresh button to update the data.



Drawing 4. Side panel – Disk data

• **Connected with** – this field contains basic info about the analyser that is connected to the PC.

Connected with:			
Analyzer:	GA-40Tplus		
Serial No:	44000106		
Software:	v. 34		

Drawing 5. Side panel – Connected with

 Bank measured with – this field is visible only when online measurements are on, or if one of the stored data bank is viewed. It contains information about the analyser's equipment during the measurements.

Bank measured with:		
GA-40Tplus		
44000106		
Yes		
: Yes		
Yes		

Drawing 6. Side panel – Bank measured with

3.2 Quick access bar



Drawing 7. Quick access bar.

Quick access bar allows to access the most commonly used functions:

- Read bank from disk (Ctrl + O)– opens a file stored on a hard disk with banks or reports.
- Save active bank to disk stores to a file on hard disk, previously opened or imported from the analyser, bank or report with measurement data.
 - Restart transmission (F8) starts or refreshes the connection with the analyser.

E Read banks from the analyser (F9) – more details in chapter4.2.1

Read reports from the analyser (F11) – more details in chapter4.2.2

Read online (F12) – allows to view (and to store on a hard disk) the results currently measured by the analyser – more information can be found in chapter-4.2.3

Footers – Enables to edit the printout footers – more information in chapter4.5

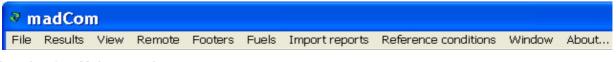
Fuels – Enables to view and edit fuel parameters – more information in chapter4.6

Reference conditions – enables to edit the coefficients used for recalculating results from mg to ppm – more information in chapter4.8

All the aforesaid functions are also available from the main menu bar.

3.3 Main menu bar

Above the quick access bar there is the main menu bar that contains all the available in this program options.



Drawing 8. Main menu bar

Each function available in the program is described in the chapter 4 of this manual

4 MADCOM FUNCTIONS

In this chapter all available functions in madCom program will be explained. They are described in an order they appear in the main menu bar.

4.1 File

Open	Ctrl+O
Save	Ctrl+S
Save as	
Export *.csv	Ctrl+X
Restart transmission Options Language	F8
Ouit	

Drawing 9. Functions available in the File sub-menu

4.1.1 Open

Function $File \rightarrow Open$ allows to open **madCom** data files. Available files extensions:

- *.bnk bank file, i.e. storage of the continuous measurements. They are stored in the \Data\Bank folder. This folder also contains Bank Set file, which saves the analyser's memory contents. Depending on the device it may have different extension: *.bks, *.bk6, *.bk5, *.bk2. Those files are created on the hard drive while reading the data from the analyser.
- *.**rps** data containers stored in the analyser as a report.
- *.bmp Printscreens of the analyser's display taken during the *Remote Control* mode.
- *.csv data exported to the CSV files. CSV files are readable by spreadsheet applications, like Microsoft Excel or OpenOffice Calc.
 - *.ftr these are the footers added to the printouts.

4.1.2 Save

Allows to save changes in the edited bank file (***.bnk**). This option is applicable only to the previously saved files.

4.1.3 Save as...

Allows to save data read from the analyser or from the open Bank Set file to a new *.bnk file.

4.1.4 Export *csv

Allows to store data in a csv file, which is readable by spreadsheet applications (like Microsoft Excel or OpenOffice Calc). This option allows to export data from ***.bnk**, and ***.bks** files. When selected, it opens a window where one can chose which data to export. *All On/Off* selects or deselects all fields. Selecting *Shortform export*, exports only measurement data. Information about the operator, device, fuel and measurement parameters are ignored. *"Export *.csv"* opens a window where one can select a destination folder and the csv file name.

6	Exporting data to *.csv file	
	Select variables for exporting Time Tgas Tamb CO2 CO2 CO2 COU Lambda SL ETA IL ETA1 CO ETA1 CO CO CO	All On/Off
	NO NO2 V SO2	Export *.csv
	CHx NOx	Shortform export
	V PRESS	Close

Drawing 10. CSV export options window.

4.1.5 Restart transmission

Starts the connection between the analyser and the PC via the selected RS-232 port. If the analyser is already connected, the connection is terminated and started again.

If, during the connection attempt, no analyser will be connected to the PC, an error message will appear.





If the error repeats, check the communication options – see if the selected COM port number corresponds to the port number where the cable is connected to.

4.1.6 Options – Communication Settings

Options available from $File \rightarrow Options$ allows to adjust the communication port settings.

Port	C Speed limit
Current port:	38400
	C 19200
	C 9600
Selecting mouse COM can cause its inactivity!	C 2400
🔽 Lock analyzer keyboard while online	
 Lock analyzer keyboard while online Automatically starts saving the online re When resuming CSV storages, always a 	
Automatically starts saving the online re	
Automatically starts saving the online re When resuming CSV storages, always a	add a new heading
Automatically starts saving the online re When resuming CSV storages, always a Automatically detect analyzer after start Check for GA-20 presence	add a new heading
Automatically starts saving the online re When resuming CSV storages, always a Automatically detect analyzer after start	add a new heading

Drawing 12. Options – communication settings.

In the *Port* section one must specify the serial COM port that will be used for communication with the analyser. In the *Speed limit* section one must select the baud rate. Maximal possible baud rate is depended on the device connected to the computer – see the table below:

Anaylser	9600	19200	38400
GA-20 plus		Х	
GA-21 plus			Х
GA-40 plus			Х
GA-40T plus			Х

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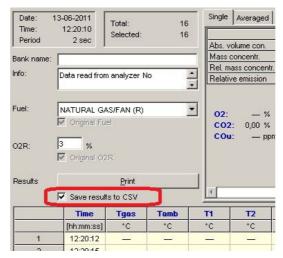
GA-60		Х
CMS-6		Х

 Tabela 1.
 Baud rate for different analysers.

In Online measurements section one can adjust:

- Interval between measurements how often the results are read from the analyser (and stored on the disk), expressed in seconds or minutes. The maximal interval is 30 minutes.
- Lock the analyser's keyboard during the online if this option is selected the analyser will not react to the pressing of keyboard keys.
- Automatically stars saving the online results to CSV file when this option is ON the program automatically starts storing the results to a CSV file on a hard disk (in the program's installation folder \Data\Online\).

If this option is OFF it is still possible to save the results to a file by selecting an option *Save results to CSV* – as it is shown in the Drawing 13.



Drawing 13. Save results to CSV file

When resuming CSV storages, always add a new heading – during the online storages it is possible to discontinue the storages results to a file (by unchecking the option shown in the Drawing 13.) If this option is on then the resume of storages will add a new heading in the csv file.

Stopping the online measurements always ends the csv file. Starting the online measurement again creates a new csv file.

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- Automatically detect analyser after start when the program runs it starts to communicate with the analyser automatically.
- Check for presence of GA-20 / GA-60 / Sensonic 2k / Photon program is designed to cooperate with different madur analysers. Its default communication protocol is set to communicate with GA-21plus / GA-40plus / GA-40Tplus analysers. If the program is to communicate with different analyser it must be selected from this list.

4.1.7 Language

Allows to change the program language. If your language is not listed, please contact **madur** to receive language file for translation. As soon as we have this file translated we prepare your language version of **madCom** program.

4.1.8 Quit

Ends the program and shuts it down.

4.2 Results

Results	
Read	banks from analyzer
Read	reports from analyzer
Read	online

Drawing 14. Functions available from Results sub-menu.

4.2.1 Read banks from the analyser

This option is available only when the analyser is connected to the PC. It reads data banks from the analyser and shows them on the screen. During the readout the Bank set file is also created (*.bks, *.bk6, *.bk5, *.bk2 depending on the device type). Each data bank opens in a separate window. Each can be saved to disk as a *.**bnk** file.

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Time:	00:30:50 10 sec	Selected:	121		CO	NO	N02	S02	CHx	NOx	
Period	10 sec		7	Abs. volume con.	0	0	0	0	0	0	[ppm]
Bank name:				Mass concentr.	0	0	0	0	0	0	[mg/m3
Info:	D 1 1 1			Rel. mass concentr.							[mg/m3
inio.	Data read from a	analyzer No	Ç L	Relative emission							[g/GJ]
	1				Combus	tion paramet			Data logg	-	
Fuel:	NATURAL GAS	(D)			Fumes			14,3 °F	T1 Ext.		°F
ruci.		(R)		O2: 20,95 %	Amb te			75,9 °F	T2 Ext.		°F
	🗹 Original Fuel			CO2: 0,01 %	Stack I		1	00,0 %	T3 Ext.		°F
O2R:	3 %			COu: ppm		-	_	0,0 % 0,0 %	T4 Ext.		°F hPa
02R.	✓ Viginal O2R					y inc. com ed efficient		0,0 %	Pressur	e 0,00	V
					Excess		-y	0,0 %	U/I 2		v
Results	_								0.1.2		
		Drint			Dew Po	DINT		0.0 K			
Reauta		<u>P</u> rint		c [Dew Po	DINE		0,0 K			
rtoouno		<u>P</u> rint		(Dew Pe	DINE		0,0 K			
	Time	Print Tgas	Tamb	O2	CO2	SL	ET		СНх	NOx	1
	Time [hh:mm:ss]	_					ET %	A	CHx %	NOx ppm	F
1		Tgas	Tamb	O2	CO2	SL		A			
	[hh:mm:ss]	– Tgas °F	L⊒ Tamb °F	02 %	CO2 1	SL %	%		%	ppm	
1	[hh:mm:ss] 00:31:00	– Tgas °F 614,3	<u>⊢</u> Tamb °F 75,9	02 % 20,95	CO2 0 % p 0,01 -	SL % 100,0	% 0,0		% 0,00	ppm 0	
1 2	[hh:mm:ss] 00:31:00 00:31:10	Tgas °F 614,3 614,1	Tamb °F 75,9 75,9	02 % 20,95 20,95	CO2 0 % p 0,01 - 0,01 -	SL % 100,0 100,0	% 0,0 0,0	A I 5 i 0 (0 (0 (0 (% 0,00 0,00	ppm 0 0	
1 2 3	[hh:mm:ss] 00:31:00 00:31:10 00:31:20	Tgas °F 614,3 614,1 613,8	E Tamb °F 75,9 75,9 75,8	O2 % 20,95 20,95 20,95	CO2 0 % p 0,01 - 0,01 -	SL % 100,0 100,0 100,0	96 0,0 0,0		% 0,00 0,00 0,00	ppm 0 0 1	
1 2 3 4	[hh:mm:ss] 00:31:00 00:31:10 00:31:20 00:31:20	Tgas °F 614,3 614,1 613,8 613,9	Tamb °F 75,9 75,9 75,8 75,9	O2 % 20,95 20,95 20,95 20,95 20,95 20,95	CO2 0 % p 0,01 - 0,01 - 0,01 - 0,02 -	SL % 100,0 100,0 100,0 100,0	96 0,0 0,0 0,0	A I 5 F D (D (D (D (D (D (D (D (D (D (% 0,00 0,00 0,00 0,00	ppm 0 0 1 1	
1 2 3 4 5	[hh:mm:ss] 00:31:00 00:31:10 00:31:20 00:31:20 00:31:30 00:31:40	Tgas °F 614,3 614,1 613,8 613,9 614,1	Tamb °F 75,9 75,8 75,9 75,9 75,9 75,9 75,9 75,9	O2 % 20,95 20,95 20,95 20,95 20,95 20,95 20,95 20,95 20,95	CO2 9 % 9 0,01 - 0,01 - 0,02 - 0,01 -	SL % 100,0 100,0 100,0 100,0 100,0	9% 0,0 0,1 0,1 0,1 0,1		% 0,00 0,00 0,00 0,00 0,00	ppm 0 1 1 0	
1 2 3 4 5 6	[hh:mm:ss] 00:31:00 00:31:10 00:31:20 00:31:30 00:31:40 00:31:50	Tgas *F 614,3 614,1 613,8 613,9 614,1 613,8	Tamb °F 75,9 75,8 75,9 75,9 75,9 75,9 75,9 75,9 75,9 75,9 75,9 75,9 75,9 75,9	O2 % 20,95 20,95 20,95 20,95 20,95 20,95 20,95 20,95	CO2 9 % 9 0,01 - 0,01 - 0,02 - 0,01 - 0,01 -	SL % 100,0 100,0 100,0 100,0 100,0 100,0	% 0,1 0,1 0,1 0,1 0,1 0,1 0,1		% 0,00 0,00 0,00 0,00 0,00 0,00	ppm 0 1 1 0 0	
1 2 3 4 5 6 7	[hh:mm:ss] 00:31:00 00:31:10 00:31:20 00:31:30 00:31:40 00:31:50 00:32:00	Tgas *F 614,3 614,1 613,8 613,9 614,1 613,8 613,8 613,8	Tamb *F 75,9 75,9 75,8 75,9 75,9 75,9 75,9 75,9	O2 % 20,95 20,95 20,95 20,95 20,95 20,95 20,95 20,95 20,95 20,95 20,95	CO2 9 % 9 0,01 - 0,01 - 0,01 - 0,02 - 0,01 - 0,01 - 0,01 -	SL % 100,0 100,0 100,0 100,0 100,0 100,0	96 0,0 0,0 0,0 0,0 0,0 0,0 0,0 0,0	FA I 5 8 D 0 D 0 D 0 D 0 D 0 D 0 D 0 D 0 D 0 D 0 D 0 D 0 D 0 D 0 D 0 D 0 D 0	% 0,00 0,00 0,00 0,00 0,00 0,00 0,00	ppm 0 1 1 0 0 0	

Drawing 15. Information about the bank read from the analyser

The upper left part of this window is an informative part, that contains:

- Date, time of the measurement and it's length
- Number of single measurements
- Bank name e.g. customer's name
- Info additional information, comment, etc.
- Fuel fuel parameters, that will be considered during the results calculation.

Date: Time: Period	02-01-2001 01:19:35 10 sec	Total: Selected:	26 26
Bank name			
Info:	Data read fr	om analyzer No	* *
Fuel:			•
02R:	3 % V Original (
Results		<u>P</u> rint	

Drawing 16. Bank – Informative part

It is possible to print the bank contents. Print button opens the window with printout options (see Drawing 17.). www.madur.com

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er proper FCreator			Printer	r <u>S</u> etup	Befr	esh previe	900		ected ro	ows on	ly .			0		1		
, 210 × 29	97 mm					<u>P</u> rint		Ave	raged	values				<u>C</u> lose				
																		_
Analyzer Type: GA-40Tplus with dryer																		
	zer No: 44000		19			with dry	101											
	are Version: C																	
	d: 2011-06-09		113															
Bank	properties:																	
Bank	properties:																	
Data r	read from ana			00106 d	on 09-06	2011 as	bank :	#2										
Data n Date:	read from ana 2001-01-02 0			M	easurem	ents: 26		#2										
Data r Date: Perioc	read from ana 2001-01-02 0 d: 10 sec	1:19:3	5	M		ents: 26		#2										
Data r Date: Perioc	read from ana 2001-01-02 0	1:19:3	5	M	easurem	ents: 26		#2										
Data r Date: Perioc	read from ana 2001-01-02 0 d: 10 sec	1:19:3	5	M	easurem	ents: 26		#2										_
Data r Date: Perioo Refere	read from ana 2001-01-02 0 d: 10 sec ence oxygen f	1:19:3 D2R: 3	5	M	easurem	ents: 26		#2										_
Data r Date: Perioo Refere	read from ana 2001-01-02 0 d: 10 sec	1:19:3 D2R: 3	5	M	easurem	ents: 26		#2										_
Data r Date: Perioo Refere	read from ana 2001-01-02 0 d: 10 sec ence oxygen f urement res	1:19:3 D2R: 3 ults ta	5 :% ble	M Fu	easuren Jel: NAT	ents: 26 URAL G			ETA1	w Poi	co	NO	NO2	502	СНх	NOx	PRESS	_
Data r Date: Perioo Refere	read from ana 2001-01-02 0 d: 10 sec ence oxygen f	1:19:3 D2R: 3 ults ta	5 :% ble	M Fu	easurem	ents: 26 URAL G	AS		ETA1	* Poi	CO	NO	NO2	SO2	CHx %	NOx	PRESS	_
Data r Date: Perioo Refere	read from ana 2001-01-02 0 d: 10 sec ence oxygen 1 urement res <u>Time Tgas</u> <u>humns *F</u> 1:19:4€612,3	1:19:3: D2R: 3 D2R: 3 Ults ta Tamb *F 74,4	5 % ble <u>02</u> % 20,95	M Fu	easurem Jel: NAT	ents: 26 URAL G.	AS	IL % 0,0										
Data n Date: Perioc Referent Meas	read from ana 2001-01-02 0 d: 10 sec ence oxygen 1 urement res hmm:s F 1-19:46612,3 1:19:56612,6	1:19:3: D2R: 3 D2R: 3 Ults ta *F 74,4 74,4	5 ble 02 % 20,95 20,95	M Fu	easuren Jel: NAT	ents: 26 URAL G. 	ETA % 0,0 0,0	IL % 0,0 0,0	% 0,0 0,0	°C 0,0 0,0	ppm 0 0	ppm	ppm	ppm 0 0	% 0,00 0,00	ppm	hPa -0,08 -0,08	-
Data n Date: Period Referen	read from ana 2001-01-02 0 1: 10 sec ence oxygen 1 urement res <u>Time Tgas</u> hmm.s *F 1.19.4€612,6 1.20.0€612,6 1.20.0€612,8	1:19:3: D2R: 3 Ults ta Tamb *F 74,4 74,4 74,1	5 ble 20,96 20,95 20,95	M Fu	easurem Jel: NAT	ents: 26 URAL G. 	ETA % 0,0 0,0 0,0	IL % 0,0 0,0 0,0	% 0,0 0,0 0,0	*C 0,0 0,0 0,0	ppm 0 0	ppm 0 0	ppm 0 0 1	ppm 0 0	% 0,00 0,00 0,00	ppm 0 0 1	hPa -0,08 -0,08 -0,08	
Data r Date: Period Refere Meas	read from ana 2001-01-02 0 1: 10 sec ence oxygen 1 urement res 1:19:4612,3 1:20:16612,3 1:20:16613,0	1:19:3: D2R: 3 Ults ta *F 74,4 74,4 74,1 74,5	5 % ble 02 % 20,96 20,96 20,96 20,96	M Fu 0,01 0,02 0,02	easurem Jel: NAT	ents: 26 URAL G. International State State 100,0 100,0 100,0 100,0 100,0	ETA % 0,0 0,0 0,0	IL % 0,0 0,0 0,0 0,0	% 0,0 0,0 0,0 0,0	*C 0,0 0,0 0,0	ppm 0 0	ppm 0 0	ppm 0 0	ppm 0 0	% 0,00 0,00 0,00 0,00	ppm 0 0 1	hPa -0,08 -0,08 -0,08 -0,08	
Data r Date: Period Refere Meas	read from ana 2001-01-02 i: 10 sec ance oxygen l urement res <u>Time Tgas</u> hmms 'F 1.19:4612,3 1.19:4612,3 1.19:5612,6 1.20:0613,0 1.20:26613,0	1:19:3 D2R: 3 D2R: 3 Ults ta Tamb *F 74,4 74,4 74,4 74,5 74,6	5 % ble 20,96 20,96 20,96 20,96 20,96	M Fu 0,01 0,01 0,02 0,02 0,02	easurem Jel: NAT	ents: 26 URAL G . % . 100,0 . 100,0 . 100,0 . 100,0 . 100,0 . 100,0	AS ETA % 0,0 0,0 0,0 0,0 0,0	IL % 0,0 0,0 0,0 0,0 0,0	% 0,0 0,0 0,0 0,0 0,0	°C 0,0 0,0 0,0 0,0	ppm 0 0 0 0	ppm 0 0 0 0	ppm 0 1 0 0	ppm 0 0 0 1	% 0,00 0,00 0,00 0,00	ppm 0 1 0 0	hPa -0,08 -0,08 -0,08 -0,08 -0,08	
Data n Date: Period Refere Meas	read from ana 2001-01-02 0 3: 10 sec ence oxygen 1 urement res Time Tgas https://dia.org/ 1.19.4(612,3) 1.19.4(612,3) 1.20.1(613,0) 1.20.2(613,0) 1.20.2(613,0) 1.20.3(613,3)	1:19:3 D2R: 3 D2R: 3 Ults ta Tamb *F 74,4 74,4 74,4 74,5 74,6 74,6 74,7	5 % ble 20,96 20,96 20,96 20,96 20,96 20,96	M Fu 0,01 0,01 0,02 0,02 0,02 0,02	easurem uel: NAT	ents: 26 URAL G . 100,0 . 10	AS 0,0 0,0 0,0 0,0 0,0 0,0	IL % 0,0 0,0 0,0 0,0 0,0 0,0	% 0,0 0,0 0,0 0,0 0,0 0,0	*C 0,0 0,0 0,0 0,0 0,0 0,0	ppm 0 0 0 0 0	ppm 0 0 0 0 0	ppm 0 1 0 0 0	ppm 0 0 0 1 0	% 0,00 0,00 0,00 0,00 0,00	ppm 0 1 0 0 0	hPa -0,08 -0,08 -0,08 -0,08 -0,08 -0,08	
Data r Date: Period Refere Meas	read from ana 2001-01-02 i: 10 sec ance oxygen l urement res <u>Time Tgas</u> hmms 'F 1.19:4612,3 1.19:4612,3 1.19:5612,6 1.20:0613,0 1.20:26613,0	1:19:3 D2R: 3 Ults ta *F 74,4 74,4 74,5 74,6 74,6 74,9	5 % ble 20,96 20,96 20,96 20,96 20,96 20,96 20,96	M Fu 0,01 0,01 0,02 0,02 0,02 0,02 0,02	easurem Jel: NAT	ents: 26 URAL G . % . 100,0 . 100,0 . 100,0 . 100,0 . 100,0 . 100,0	AS ETA % 0,0 0,0 0,0 0,0 0,0	IL % 0,0 0,0 0,0 0,0 0,0	% 0,0 0,0 0,0 0,0 0,0	°C 0,0 0,0 0,0 0,0	ppm 0 0 0 0	ppm 0 0 0 0	ppm 0 1 0 0	ppm 0 0 0 1	% 0,00 0,00 0,00 0,00	ppm 0 1 0 0	hPa -0,08 -0,08 -0,08 -0,08 -0,08	

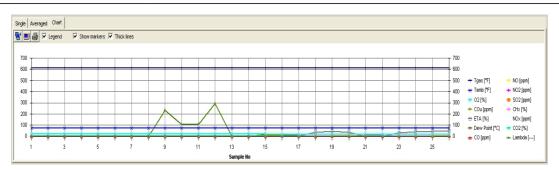
Drawing 17. Printout options window

	CO	NO	NO2	S	02	CHx	NOx	
Abs. volume con.	0	0	0		0	0	0	[ppm]
Mass concentr.	0	0	0		0	0	0	[mg/m3
Rel. mass concentr.								[mg/m3
Relative emission								[g/GJ]
02: 20,95 % C02: 0,01 % C0u: — ppm	Fumes t Amb tem Stack lo Efficience Loss by	np. Iss cy inc.comb d efficienc air	6 1	12,3 74,4 00,0 0,0 0,0 0,0 0,0	°F °F % % %	Data logge T1 Ext. T2 Ext. T3 Ext. T4 Ext. Pressure U/I 1 U/I 2		°F °F °F Pa V V

Drawing 18. Windows with data, read from the analyser's bank.

Choice of view (upper right part of the window) allows to switch between different views of the data from the bank / online measurements. The following view types are available:

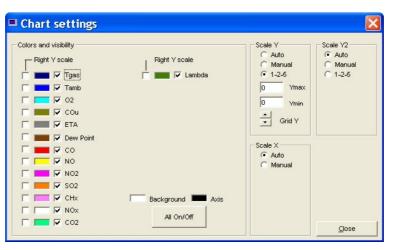
- Single shows detailed information about selected measurement:
- Averaged averages the result for the selected measurements
- **Chart** results are presented in a graphical form.



Drawing 19. Results presented in a graphical form

Chart window contains additional options (small icons above the graph):

- Zoom chart to full screen (Ctrl + Z) opens the chart in a larger window (as it is shown in Drawing 21.)
- Chart settings (F5) Opens a window with charts options. This is where one can select which values are presented in the chart, change its colour, or change the chart's scale.



Drawing 20. Chart's settings

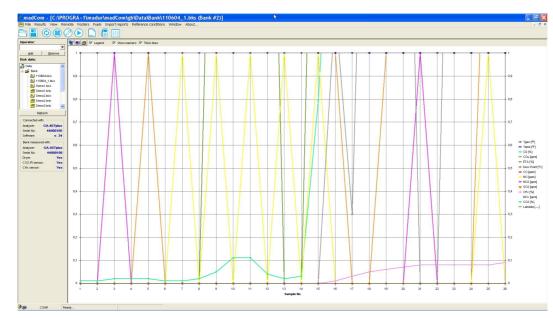
The right side part of chart settings window allows to change the chart's scale:

- **Auto** the scale is adjusted automatically
- **Manual** user can set the scale according to own needs.
- 1-2-5 the borderline values of the scale are the multiplications of numbers 1, 2 5

On the left there are options that allow to show / hide variables in the chart and allow to adjust the colour of the variable

- Chart printing
- Show / hide legend

Thick lines



Drawing 21. Chart in a full screen mode

All the aforesaid charts options are also available from the *Main menu* \rightarrow *View* sub-menu.

4.2.2 Read reports from the analyser

This option is active only when the analyser is connected. If the analyser contains reports a following window appears:

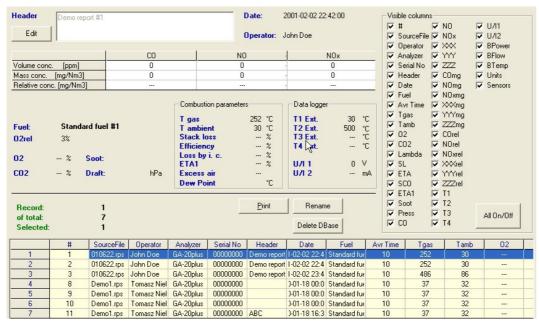
le: 110604.rps wed by operator:	Rename	Add to database	
le includes 3 reports	Delete file	Cancel	
Extended temperature range (ver. > 0.23) Report he	ader	ved by opera	
1		02-01-01	
2		02-01-01	
3		02-01-01	

Drawing 22. The readout of the reports from the analyser's memory.

This window contains information about the report's heading and the date when the report was taken. To read the report's contents the report must be added to a database first – button *Add to database*.

4.2.2.1 Opening database

To view the contents of a report one must open a database file where this report is assigned to (see the chapter4.2.2). From the side panel, from the **Disk data** section (see Drawing 4.) single-click a database to open it. The following window appears:



Drawing 23. Data read from the database.

The bottom part of the window contains a list of reports in the opened database. On the right in the *Visible columns* section, user can select which values are shown and can be printed.

From this window it is possible to modify the header, rename the database or to delete the database file from the hard disk.

4.2.3 Read online...

Online measurements are available from the **Main menu** bar: Results \rightarrow Read

online... or by pressing the \bigcirc icon from the **Quick access** bar or by pressing the F12 function key. During the online reading, the results from the analyser are presented on the PC monitor, and if proper option is selected, they are stored into csv file on a hard disk. Options related to the online reading are available from *Options – Communication settings* window (see chapter4.1.5for more details).

Drawing 24. Online measurements.

Online reading is similar in its functionality to bank readout from the analyser. User can view single result, averaged results (see chapter4.2.1) or to view them in a graph form (see Drawing 19.)

During the online reading it is possible to stop / resume the storage of the results into the csv file by selecting the option shown in the Drawing 25.. To stop the online measurements press *Stop online* button in the *Side bar* panel (see Drawing 26.)

Date: 1 Time: Period	3-06-2011 12:20:10 2 sec	Total: Selected:	16 16		Averaged
Bank name:					concentr.
Info:	Data read fron	n analyzer N	40	A	nass concentr. ive emission
Fuel:	NATURAL GA			• 02: co	
02R:	3 % V Original O2	2R		co	u: — ppn
Results		<u>P</u> rint			
C	🔽 Save result	ts to CSV		4	
	Time	Tgas	Tamb	T1	T2
	[hh:mm:ss]	°C	°C	°C	°C
1	12:20:12		<u> </u>		<u> (1 – 11)</u>
	10.00.15				

Drawing 25. Stop / resume online storage into csv file

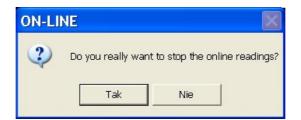
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Manual

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Analyzer:	GA-40Tplus
Serial No:	44000106
Software:	v. 34
Bank measured	d with:
Analyzer:	GA-40Tplus
Serial No:	44000 06
Dryer:	Yes
CO2 IR sensor	: Yes
CHx sensor:	Yes
Stop a	online

Drawing 26. Stop online readings



Drawing 27. Warning announcement before stopping the online measurements

4.3 View

View	
Chart settings	F5
Zoom chart to full screen	Ctrl+Z
Table settings	Ctrl+T
✓ Show all columns	Ctrl+A

Drawing 28. Functions available from the View submenu

This options is available only when viewing the contents of reports and banks. It allows to adjust the data presentation in tables and on the graph. Available functions are described in chapter 4.2.1.

4.4 Remote control

This option allows to remotely (on the PC monitor) view the contents of the analyser's display. It also allows to send the commands to the analyser as they were evoked from the analyser's keyboard. Button *Capture display contents* creates a bmp file on hard disk (in \Data\Display directory) with a copy of the display's image.

Remote control	
+ BANKS	LIGHT OFF
ISTORAGE: BANKS TABLE +	7 8 9 STU WWX YZ/ ♠ 4 5 6 JKL MNO PQR ♠ ●
Variables: Tamb T9as 02 CO NO NO2 SO2 CO2 CxH9	1 2 3 ABC DEF GHI 0 C/Del DATA
Pres. NOx Period: 10 sec	PAPER PRINT MENU
Analyzer status Charging Flow too low Ready Check probe!	73% 88l/h Capture display
Dryer Battery low Backlight	Pump Flow Close

Drawing 29. Remote control panel

4.5 Footers

This function allows to create or edit the footers used in the printouts. It is possible to access this option be single-clicking a **ftr** file in the *Footer* folder from the side panel.

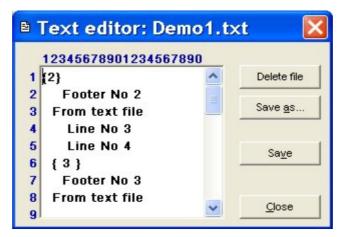
📽 Footers	
Footers list	Footer 2
#2: Footer No 2	Footer No 2 From analyzer Line No 3 Line No 4
#8: [Footer No 8] #9: [Footer No 9] #10: [Footer No 10] #11: [Footer No 11]	Analyzer Read from Send to
#12: [Footer No 12] #13: [Footer No 13] #14: [Footer No 14	File Open Save as
Import *.txt Export *.txt	Clear all Delete file Close

Drawing 30. Footer editor

The Footer editor's options:

- **Open** opens ftr file with footer definition from the hard disk.
- Save save changes in the edited footer.
- Save as saves the footer definition in a different file.
- **Read from...** read the footers from the analyser.
- Send to... send the edited footer back to the analyser.
- **Delete file** deletes the edited footer from the hard disk.
- Clear all clears all the line in the edited footer.

It is possible to import / export footer from / to txt file. Opening txt file from the side panel (form the Footer folder) opens footer editor:



Drawing 31. Editing footers from the txt file.

4.6 Fuels

This option allows to edit fuel parameters. It is important to use the correct fuel parameters as they are used for calculation made by analyser. Selecting Fuels, the following window is opened:

<u>ww.madur.com</u>				N	lanual						m	adCor
		Fuel No	Name	CO2max	HV	A1	В	Alpha	02ref	Vss	Vair	Eta bonus
Fuel # 0		1		%	MJ/m3 MJ/kg				%	m3	m3	%
Name Light oil		0	Light oil	15,4	42,7	0,5	0,07	52	13	10,53	11,2	0 (
CO2max 15,4	%	1	Natural gas	11,7	35,9	0,37	0,09	32	3	8,56	9,54	0 .
HV 42,7	MJ/kg	2	Town gas	13,1	16,1	0,35	0,11	32	3	3,61	3,9	0.
	MUKU	3	oke-oven ga	10,2	17,4	0,29	0,11	32	3	3,86	4,28	0 -
A1 coeff. 0,5		4	Liquid gas	14	93,2	0,42	0,08	32	3	22,3	24,36	0 .
B coeff. 0,07		5	Extra light oil	15,3	41,8	0,59	0	52	3	10,53	11,2	0 0
Alpha 52	«	6	Pit-coal 31.5	18,8	31,5	0,683	0	69	11	7,92	8,11	0 (
		7	Pit-coal 30.3	18,5	30,3	0,672	0	69	11	7,7	7,91	0 0
O2ref 13	%	8	Charcoal	19,1	0,93	0,988	0	69	11	4,01	4,09	0 0
Vss 10,53	m3	9	* Test fuel *	0	3,59	0,37	0,09	32	3	8,56	9,54	0 (
Vair 11,2	m3	10		15	0	0,6	0	0	3	8	8	0 (
		11	test	1	2	3	4	5	6	7	8	9 (
Fuel ETA bonus 0	%	255	Empty	12	0	0	0	52	3	10	10	0 0
Gaseous fuel												
Delete fuel(s) Add new fuel Send		lead from analyzer	<u>C</u> lose									

Drawing 32. Fuel parameters window

Fuels highlighted in blue are predefined by manufacturer and they cannot be modified. Fuels highlighted in white are user-defined and are freely editable. User can:

- delete a fuel (applicable only to user-defined fuels)
- add a new fuel
- send fuel to / read fuel from the analyser's memory (true only to the Photon gas analyser)

4.7 Import reports from Photon SD / MMC card

Reports import	×
Reports import - select directory	
C:\PROGRA~1\madur\madCom	
	Browse
Import	Close

Drawing 33. Import reports from Photon SD / MMC card

Photon analyser is equipped with SD / MMC card reader where measurement reports are stored. This program's option allows to import reports stored on the SD / MMC card.

4.8 Reference conditions

Here is where it is possible to define coefficients used for recalculating the results from **ppm** to **mg**. Button *Default* restores the factory set values.

* Para	ameter	S		
	ents mg/ppm			Cancel
со	1,25	H2S	1,669	<u>0</u> K
NO	1,358	H2	0,09	
NO2	2,081	CI2	3,263	
NOx	2,081	нсі	1,661	
SO2	2,97	HCN	1,221	
		СНх	0,781	
				<u>D</u> efault

Drawing 34. Defining coefficients used for recalculating results from ppm to mg.

4.9 About

4 About	×
	OUL RONICS
mad Version Software for mad	n 1.1.8

Drawing 35. Information about the program.

This option displays information about the program – version, manufacturer, etc.

madCom

5 USING MADUR USB-TO-RS232 CONVERTER

The standard cable for communication with the madur analysers is "true" RS-232 cable. RS-232 is an industrial standard that provides stable, resistant to errors communication for long distances (even up to few hundred meters).



Drawing 36. "True" RS-232 communication cable

Because nowadays personal computers, especially laptops, are rarely equipped with RS-232 ports, **madur** offers its clients optional USB-TO-RS232 converter cable. This cable is build using the best quality parts, that provides the best communication stability.



Drawing 37. madur USB-TO-RS232 converter cable

As in case of most USB equipment, **madur** cable requires drivers for proper work. Suitable drivers are included in the madur software CD, in the *service_madur_USB* folder. They are also available from website: <u>http://www.ftdichip.com/Drivers/VCP.htm</u>.

www.madur.com Manual	madCom
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Detailed manuals concerning installation of USB drivers in different Windows platforms can be found here: <u>http://www.ftdichip.com/Support/Documents/In-</u> <u>stallGuides.htm</u>

To check if the installation of USB cable was successful, please go to *Control* $Panel \rightarrow System \rightarrow Device Manager$ and see if there is a USB Serial Port entry in Ports (COM & LPT) nod. Number in brackets (in the picture below it is COM3) specifies the COM port assigned to the madur USB-TO-RS232 converter cable – this COM port should be selected in the **madCom** program in the Communication Settings window – for more details see chapter4.1.6.

Device Manager	
le Action View Help	
• 🔿 📰 🔛 🔢 📷 📖 🔛 🙀 📭	
Floppy drive controllers	
> - IDE ATA/ATAPI controllers	
> - Keyboards	
Mice and other pointing devices	
🦻 📲 Monitors	
Network adapters	
Ports (COM & LPT)	
- Transmission Port (COM1)	
1 Duinter Dark (IDT1)	
USB Serial Port (COM3)	
Sound, video and game controllers	
⊳ 🚛 System devices	
🖌 🏺 Universal Serial Bus controllers	
🟺 Intel(R) 82801EB USB Universal Host Controller - 24D2	
🛄 🖣 Intel(R) 82801EB USB Universal Host Controller - 24D4	
🟺 Intel(R) 82801EB USB Universal Host Controller - 24D7	
📖 🟺 Intel(R) 82801EB USB Universal Host Controller - 24DE	
🟺 Intel(R) 82801EB USB2 Enhanced Host Controller - 24DD	
🖟 USB Root Hub	
🟺 USB Root Hub	
🖶 USB Root Hub	
🖶 USB Root Hub	
USB Root Hub	

Drawing 38. USB-TO-RS232 converter successfully installed.