

EnCal 3000 Gas Chromatograph Software Manual

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Con	tact	Information	2
Gas	quali	ity measurement system EnCal 3000	3
1	Intr	oduction	5
	1.1 1.2 1.3 1.4 1.5 1.6	System Requirements Installation CD RGC3000 installation WinDCS History Log Update MicroGC	.5 .6 11 14
2	IP S	ettings PC	25
	2.1 2.2 2.3	Configuration with default IP Settings Configuration with customer specific IP Settings Upload of GC Configuration	31 36
3	Ove	rview of the Main Functions4	1
	3.14 3.15 3.16	Verification Check and Alarms (Menu Application) Relays (Menu Application)	41 43 45 48 49 51 52 53 55 56 58 50 51
4		ndard Operations	
_	4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8	Introduction	52 56 72 73 75 76 80
5	Quic	k Start-up 8	33
	5.1 5.2 5.3 5.4 5.5 5.6 5.7	Introduction	83 84 85 87 88



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Gas quality measurement system EnCal 3000

The gas quality measurement system EnCal 3000 consists in its basic configuration of a measuring unit and an optional EnCal3000 controller.

The measuring unit of the analysis is conducted by measuring autonomy while using a PC program is parameterized. Optionally, additional computers can be installed (see Figure 1).

The parameterization of the measuring unit is done with the PC program "RGC 3000". This manual is describing this software. The other subsystems are described in 2 separate manuals.

The subsystems communicate with each other via Modbus. It is performed by a computer, the role of the Modbus master that controls the measuring unit (Modbus slave). The other two optional computers behave as so-called listener, i.e. they read the communication with the Modbus and extract the relevant data. The Modbus listeners send and process any commands.

The controller can be used as main display and recording device inside the gas quality measurement system EnCal 3000. Each controller can process one or two gas streams, in which a gas stream can also be assigned to several computers. So that it is possible to, for example, to distribute the data of a gas stream to multiple (DSfG) buses. The measured values are displayed on the display.

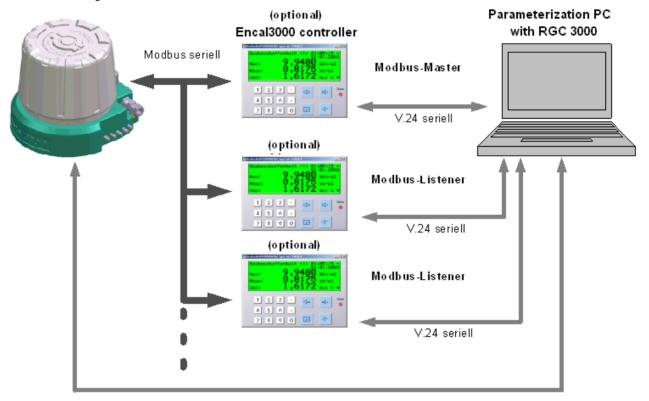
In its function as a Modbus master, the controller serves as a tool to operate the process gas chromatograph (e.g. a calibration can be performed). In addition to the main registration function the controller gives additional a number of operating functions.

The parameterization of the controller is done via the PC program "Gas Works". This software and further details of the computers are in a third manual described.

A fourth optional manual is finally for an overview on specific applications of the EnCal 3000.



Basic configuration EnCal 3000 (Measuring unit and an optional Encal3000 controller)



Measuring unit , Modbus-Slave

Ethernet 10Base-T

Figure 1



1 Introduction

This chapter describes how to install RGC3000 and other optional and convenient tools. All programs can be found on the Installation CD-ROM, included with the unit.

1.1 System Requirements

Hardware

Processor speed:	Processor with 1000MHz Clockspeed or higher
Internal RAM:	Recommended 512MB RAM or more.
Peripherals:	CD-Rom player
-	Free Ethernet port
	Free USB slot Software:

Software

Windows versions:

Windows 2000 or Windows XP professional edition (Service Pack 1 or higher) or Windows 7 *If Windows XP SP2 is installed, the windows firewall must be disabled!*

1.2 Installation CD

Before installation:

Users must log in as a "Windows administrator". Make sure no other Windows applications are running during the installation.

Caution: Make a Backup before you change the software installation. Save the existing Settings from "Method"; "Application"; "Sequence"; "Site Information" and "Modbus Settings" as described in chapter 3.5!

The CD-Rom is auto-starting. If not, double-click on the file "autorun.exe" located in the CD main directory. Following programs are on the CD:

SetupPROstation
SetupHistoryLog
SetupWinDCS

Depending on the chosen menu item it will install:

setupPROstation	Configuration, trouble-shooting and generation of reports exclusively designed for
	the EnCal 3000
🌄 SetupHistoryLog	Data log of the last 35 days according API chapter 21.1
🛃 SetupWinDCS	Test and simulation tool for the ModBus communication (serial and TCP/IP) of the EnCal 3000

After choosing a menu item the setup will guide the user through the Installation procedure. See the next chapters for details.

Please note: Versions shown in the pictures of this documentation are not always the same as you will install!



1.3 RGC3000 installation

After choosing the SetupPROstation item from the setup menu a welcome screen will be visible, this shows the software version and displays some important notes.



Clicking on "Next" leads to the license Agreement. Read this carefully.



NGC 3000 Setup	×
License Agreement Please read the following license agreement carefully.	
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ATTENTION: DOWNLOADING, COPYING, PUBLICLY DISTRIBUTING, OR USING THIS SOFTWARE IS SUBJECT TO THE AGREEMENT SET FORTH BELOW.	
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IF YOU DO NOT AGREE TO BE BOUND BY THE SOFTWARE LICENSE AGREEMENT	-
 I agree to the terms of this license agreement I do not agree to the terms of this license agreement 	
< <u>B</u> ack <u>N</u> ext > <u>C</u> ancel	

Select the button "I agree to the terms of this license agreement" and click on "Next".

😓 RGC 3000 Setup	×
Important Information Please read the following information.	
RGC 3000 is only capable of controlling Encal 3000	*
	Ŧ
< <u>B</u> ack <u>N</u> ext > <u>C</u> ancel	

Leave this advice with a click on "Next"



86 RGC 3000 Setup	×
Installation Folder Where would you like RGC 3000 to be installed?	
The software will be installed in the folder listed below. To select a different location new path, or click Change to browse for an existing folder.	, either type in a
Install RGC 3000 to:	
c:\RGC 3000	Change
Space required: 42.9 MB Space available on selected drive: 176.62 GB	
< <u>B</u> ack <u>N</u> ext >	<u>C</u> ancel

Select the folder where RGC3000 will be installed. Click on "Next".

😓 RGC 3000 Setup	— ×
Shortcut Folder Where would you like the shortcuts to be installed?	
The shortcut icons will be created in the folder indicated below. If you don't wa folder, you can either type a new name, or select an existing folder from the list.	
Shortcut Folder:	
Chromatography	-
 Install shortcuts for current user only Make shortcuts available to all users 	
< <u>B</u> ack <u>N</u> ext >	Cancel



Fill in the name of the Shortcut folder and select whether shortcuts may be available to all users. Then click "Next".

Note: Installing shortcuts for the current user only is not a hard protection mechanism. Only the current user will have a RGC3000 shortcut in the Windows Start menu. Another user can still run RGC3000 if he finds the PROstation on the hard disk

RGC 3000 Setup	×
Ready to Install You are now ready to install RGC 3000	
The installer now has enough information to install RGC 3000 on your computer	г.
The following settings will be used:	
Install folder: c:\RGC 3000	
Shortcut folder: Chromatography	
Please click Next to proceed with the installation.	
< <u>B</u> ackInstall	<u>C</u> ancel

Setup is now ready to transfer files to the computer, click on "Install".





After the installation is finished the computer *must be restarted* to complete the installation.

The Following notice becomes shown

Notice	83	
?	Your computer must be rebooted in order to complete the installation. Would you like to reboot your system now?	
	Ja Nein	

With a click on "Ja" (yes) the computer will reboot.



1.4 WinDCS

Before installation:

Users must log in as a "Windows administrator". Make sure no other Windows applications are running during the installation.

After choosing the ^{5etupWinDC5} item from the setup menu a welcome screen will be visible, this shows the software version and displays some important notes.



Clicking on "Next" leads to the license Agreement. Read this carefully. Select the button "I agree to the terms of this license agreement" and click on "Next".

😼 WinDCS Setup	×
Important Information Please read the following information.	
WinDCS is a tool simulating a Master Modbus DCS system via Modbus TCP/IP or Modbus serial communication protocol.	
< <u>B</u> ack <u>N</u> ext >	<u>C</u> ancel

EnCal 3000 – Software Manual



Leave this advice with a click on "Next"

WinDCS Setup
Installation Folder Where would you like WinDCS to be installed?
The software will be installed in the folder listed below. To select a different location, either type in a new path, or click Change to browse for an existing folder.
Install WinDCS to:
c:\Micro-GC Tools\WinDCS Change
Space required: 3.52 MB
Space available on selected drive: 26.06 GB
< <u>B</u> ack <u>Dext</u> <u>C</u> ancel

Select the folder where WinDCS will be installed. Click on "Next".

🖫 WinDCS Setup 🔀
Shortcut Folder Where would you like the shortcuts to be installed?
The shortcut icons will be created in the folder indicated below. If you don't want to use the default folder, you can either type a new name, or select an existing folder from the list.
Shortcut Folder:
Micro-GC Tools
 Install shortcuts for current user only Make shortcuts available to all users
< <u>B</u> ack <u>Next</u> > <u>C</u> ancel

Fill in the name of the Shortcut folder and select whether shortcuts may be available to all users. Then click on "Next"



Note: Installing shortcuts for the current user only is not a hard protection mechanism. To prevent unauthorized access, so please pay attention to an appropriate allocation of access rights.

🎭 WinDCS Setup	×
Ready to Install You are now ready to install WinDCS 2.20.0.5	
The installer now has enough information to install WinDCS on your computer.	
The following settings will be used:	
Install folder: c:\Micro-GC Tools\WinDCS	
Shortcut folder: Micro-GC Tools	
Please click Next to proceed with the installation.	
< <u>B</u> ack	<u>C</u> ancel

Setup is ready to transfer files to the computer, click on "Install".

After installation close the window with "Finish"

The Following notice becomes shown:



After the installation the computer *must be restarted* to complete the installation. Click on "Ja" (Yes) to do this.



1.5 History Log

Before installation:

Users must log in as a "Windows administrator". Make sure no other Windows applications are running during the installation.

After choosing the ^{5etupHistoryLog} item from the setup menu a welcome screen will be visible, this shows the software version and displays some important notes.



Clicking on "Next" leads to the license Agreement. Read this carefully.



😓 HistoryLog Setup	×
License Agreement Please read the following license agreement carefully.	
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IF YOU DO NOT AGREE TO BE BOUND BY THE SOFTWARE LICENSE AGREEMENT	-
 I agree to the terms of this license agreement I do not agree to the terms of this license agreement 	
< <u>B</u> ack <u>N</u> ext > <u>C</u> ancel	

Select the button "I agree to the terms of this license agreement" and click on "Next".

😓 HistoryLog Setup	×
Important Information Please read the following information.	
For proper operation, HistoryLog requires the instrument license "API chapter 21"!	*
	Ŧ
< <u>B</u> ack <u>N</u> ext > <u>C</u> ance	

Click "*Next*" to continue the installation.



😓 HistoryLog Setup	—
Installation Folder Where would you like HistoryLog to be installed?	
The software will be installed in the folder listed below. To select a different loca new path, or click Change to browse for an existing folder.	ation, either type in a
Install HistoryLog to:	
c:\HistoryLog	C <u>h</u> ange
Space required: 15.6 MB Space available on selected drive: 176.51 GB	
< <u>B</u> ack <u>N</u> ext >	<u>C</u> ancel

The default installation folder is "C:\HistoryLog". If you want to change this folder click "change" and select another folder. Then click "*Next*" to continue.

😓 HistoryLog Setup 🛛 💌
Shortcut Folder Where would you like the shortcuts to be installed?
The shortcut icons will be created in the folder indicated below. If you don't want to use the default folder, you can either type a new name, or select an existing folder from the list.
Shortcut Folder:
Chromatography -
 Install shortcuts for current user only Make shortcuts available to all users
< <u>B</u> ack <u>N</u> ext > <u>C</u> ancel



The shortcut folder refers to the icon on the desktop. It is possible to change the default folder. Click "*Next*" when finished.

🛃 HistoryLog Setup
Ready to Install You are now ready to install HistoryLog 2.44.0.1
The installer now has enough information to install HistoryLog on your computer.
The following settings will be used:
Install folder: c:\HistoryLog
Shortcut folder: Chromatography
Please click Next to proceed with the installation.
< <u>B</u> ack <u>I</u> nstall <u>C</u> ancel

Click "Install" to start the installation. The installation will copy now all files to your computer.

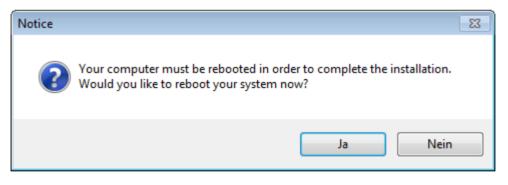




Click "Finish" to end the installation.

After the installation is finished the computer *must be restarted* to complete the installation.

The Following notice becomes shown.



Click on "Ja" (yes) to restart the computer.



1.6 Update MicroGC

If necessary, you will receive a software update. The following section describes the installation and use for the update from version 2.20 build 19606. If you want to update an older version (e.g. 1.4.1) you must it update to version 2.20 build 19606 in a first step. The procedure to do that is given in the attached manufacturer description "firmware_update_manual".

For initial installation and commissioning of new equipment, you can skip this section and continue with chapter 2. If the new mainboard from the type G3581-65000 is used, the firmware version 3.27 should be already installed. This section can also be skipped in this case.

Please note: Versions shown in the pictures of this documentation are not always the same as you will install!

Before installation:

Users must log in as a "Windows administrator". Make sure no other Windows applications are running during the installation.

After choosing the file setupUpdateMicroGC_2.30 a welcome screen will be visible, this shows the software version and displays some important notes.

👼 Micro GC Firmware Updat	te Tool Setup. Agilent Technologies 🛛 🛛
	Welcome to the installer of Micro GC Firmware Update Tool. This tool updates the Micro GC firmware to version 2.30. Please note that updates can only be performed on firmware versions 2.00 or newer. Click Next to continue.
	< <u>B</u> ack <u>Next</u> <u>Cancel</u>

Clicking on "Next" leads to the license Agreement.

Read this carefully.

Select the button "I agree to the terms of this license agreement" and click on "Next".



B Micro GC Firmware Update Tool Setup	8	X
Installation Folder Where would you like Micro GC Firmware Update Tool to be installed?	H	
The software will be installed in the folder listed below. To select a different loca new path, or click Change to browse for an existing folder.	ition, either type	ein a
Install Micro GC Firmware Update Tool to:		
C:\Micro-GC Tools\Firmware Update\2.30	C <u>h</u> ange	a
Space required: 4.80 MB Space available on selected drive: 260.73 GB		
< <u>B</u> ack <u>N</u> ext >	<u>C</u> ancel	

The default installation folder is **C:\Micro-GC Tools\Frirmware Update\2.30**. If you want to change this folder click "Change..." and select another folder. Then click "*Next*" to continue.

So Micro GC Firmware Update Tool Setup	8	
Shortcut Folder Where would you like the shortcuts to be installed?		11
The shortcut icons will be created in the folder indicated below. If you don't wa folder, you can either type a new name, or select an existing folder from the list		Jefault
Shortcut Folder:		
Micro-GC Tools\Firmware Update\2.30		*
< <u>B</u> ack <u>N</u> ext≻	<u>C</u> ance	9

The shortcut folder refers to the icon on the desktop. It is possible to change the default folder. Click "Next" when finished.



Son Micro GC Firmware Update Tool Setup	4	×
Ready to Install You are now ready to install Micro GC Firmware Update Tool 2.30	H	4
The installer now has enough information to install Micro GC Firmware Update computer.	Tool on your	
The following settings will be used:		
Install folder: C:\Micro-GC Tools\Firmware Update\2.30		
Shortcut folder: Micro-GC Tools\Firmware Update\2.30		
Please click Next to proceed with the installation.		
< <u>B</u> ack <u>N</u> ext >	<u>C</u> ancel	

Click "Next" to start the installation. The installer will now copy all the files on your computer.



Click "Finish" to end the installation



With the following dialog you can start the program right now, select "Yes" or you can leaf the installation sheet by a click on "No".

Run Up	dateMicroGC.exe	8	\mathbf{X}
?	Do you want to upda	te a Micro-G	C now?
	Yes	No	

If you have chosen "No", you can open the update program through the following path:

📑 Programs 🔹 🖮 Micro-GC Tools 🔹 👘 Firmware Update 🎽 📻 2.30 🔹 📚 UpdateM
--

It appears the launch window "Update Micro-GC" in which you must enter the IP address first.

This requires a proper connection to the GC!

The IP address can be found as described in Section 2.1.

Supdate Micro G	. 🗖 🗖 🔀
	UpdateFirmware
2007 - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10	Internet Protocol (TCP/IP) Properties:
	IP Address: 10.49.124.234
Get MPU version	Current firmware version: Instrument Serial Number:
Update Firmware	This program will update the Firmware of the Micro-GC to the version 2.30.
Reboot Micro GC	
	Rev. 2.1.0.24088 Copyright(C) 2013 Agilent Technologies

After entering the address in IP address, click the button "Get MPU version"

The page changes to display the installed version and the serial number. The Update Firmware button becomes active. See the following illustration:



Supdate Micro GC		
	UpdateFirmware	
	Internet Protocol (TCP/IP)	
	IP Address: 10.49.124.2	34
	Current firmware version:	Instrument Serial Number:
Get MPU version	2.20 Build 19606	60500225
Update Firmware	This program will update the to the version 2.30.	Firmware of the Micro-GC
Reboot Micro GC		
F	Rev. 2.1.0.24088 Copyright(C) 2	2013 Agilent Technologies
MPU version number su	ccesfully uploaded!	

Click on "Update Firmware"

The program performs the installation. The editing is displayed in the bottom line.

Supdate Micro GC		
	UpdateFirmware	
	Internet Protocol (TCP/IP)	Properties:
	IP Address: 10.49.124.23	34
	Current firmware version:	Instrument Serial Number:
Get MPU version	2.20 Build 19606	60500225
Update Firmware	This program will update the to the version 2.30.	Firmware of the Micro-GC
Reboot Micro GC		
Re	ev. 2.1.0.24088 Copyright(C) 2	2013 Agilent Technologies
All files transferred succes	sfully! Please reboot the GC.	

After the transfer, a message appears to reboot the GC. Therefore, click on "Reboot Micro-GC"

The GC will then perform a reboot, it takes about 45 seconds.



Supdate Micro GC		🗙
	UpdateFirmware	
	Internet Protocol (TCP/IP)	Properties:
	IP Address: 10.49.124.2	234
	Current firmware version:	Instrument Serial Number:
Get MPU version	2.20 Build 19606	60500225
Update Firmware	This program will update the to the version 2.30.	e Firmware of the Micro-GC
Reboot Micro GC		
Re	ev. 2.1.0.24088 Copyright(C)	2013 Agilent Technologies
Wait till Micro GC is reboo	ted and then select 'Get MPU	Version'

A note on the bottom line is announcing that once again the "**Get MPU version**" function has to be performed after the end of the reboot process. Wait for the reboot time and click the Next button.

(Note: If you click on "Get MPU version" too early an error message appears, you wait a bit and click again.)

💐 Update Micro GC		8 - 2
22	UpdateFirmware	
1 2007 	 Internet Protocol (TCP/IP)) Properties:
	IP Address: 10.49.124.2	234
	Current firmware version:	Instrument Serial Number:
Get MPU version	2.30 Build 24085	60500225
Update Firmware	This program will update the to the version 2.30.	e Firmware of the Micro-GC
Reboot Micro GC		
F	Rev. 2.1.0.24088 Copyright(C)	2013 Agilent Technologies
MPU version number su	ccesfully uploaded!	

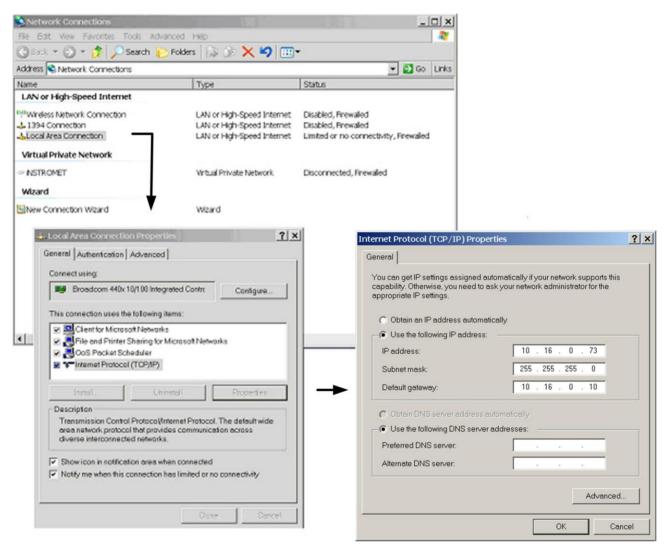
The display is updated to reflect the successful installation of the bottom line known.

Close to exit the window with the X for the operation.



2 IP Settings PC

To establish communication with the GC, both PC and GC have to be on the same network. The default IP settings for the EnCal 3000 are:



Of course other IP settings are possible. Always make sure however to have the GC and PC operating in the same IP range as defined by the Subnet Mask.





2.1 Configuration with default IP Settings

Double-click the RGC 3000 icon on your desktop and enter the following:

User name Login	e : adm : dem			
R	GC 3000			×
	<u>U</u> ser Name: <u>P</u> assword:	admin		
	ОК	Cancel	Change	

Default the password "demo" is set for the administrator level. Passwords can be changed or deactivated by clicking on "Change".

	Username	Password
Admin:	admin	admin
Service:	service	demo
Read Only:	read	

The following screen appears for a few seconds:



After that the Configuration dialog box opens, which gives an overview of the systems installed on the PC. It allows also creating a new instrument with selection of File "New Instrument".



🔡 RG	C 3000 (A	dmin)			
File	Control	Help			
D	3				
				Control	
				Configured Instruments	EnCal 3000
#	Serial		Title	Connection	elster
					© Agilent Technologies, 2014 Elster Instromet
Select	'File' - 'Nev	v Instrum	ent' to configure a new ins	strument.	

Choose "New Instrument "in File-Menu.





nstrument Type:	EnCal 3000	Configure
Serial Number:		E
Title:	EnCal 3000	
Fitle:	EnCal 3000	

Select "Configure"

😃 En	Cal 3000 Con	figuration (Adn	nin)			s - D x
_ Ethe	ernet Communicati	ion Setup			Ser	vices
ю	Address: 10	190 65	5 10	Setup IP address		Calibrate pressure sensors
1	Address. j To	J 130 J 0.	5 1 10	Setup IP address		Reboot EnCal 3000
						1100001 211001 30000
Con	figuration settings					
ſ	Hardware		User	RGC 3000	Automation	Info
					Max. column	
		<u>GC Channel</u>	Heated Injector	Backflush to vent	temp. [°C];	Detector
	Channel 1:	🔽 Installed	🔲 Installed	Installed	180	TCD -
	Channel 2:	🔽 Installed	Installed	🦳 Installed	180	TCD 💌
	Channel 3:	🔽 Installed	Installed	🦳 Installed	180	TCD 💌
	Channel 4:	🔽 Installed	Installed	Installed	180	TCD •
	Common:	Heated samp	le line			
	<u>Available licens</u>	es:				
		F PRO License	🔲 Ene	ergy Meter option	🔲 API chapter 21	
		🦳 Modbus serial	Moo	dbus TCP/IP	Veb server	
	🥅 Virtual EnCa	al 3000				
Instr	rument serial numb	er:			Upload Config	<u>R</u> eset Config
			<u>0</u> K	<u>C</u> ancel		

First the IP address has to be defined: double-click the button "Setup IP address" Typically a screen as below appears:



🌠 Setup Ethernet Co	onnection	×
Select IP address		
IP Address: 10	. 190 . 65 . 10 Ping	Close
Assign new static IP a	ddress	
Subnet Mask:	255.255.255.0	
Gateway:	10.190.65.1 Assign IP address	
Hostname:	EnCal 3000	
To assign a new IF	Paddress, make sure the instrument is started in BOOTP made.	
# IP address	serial number controlled by workstation	
	Eind EnCal 3000's on the subnet	

Select "Find EnCal 3000's on the subnet". The GC which is connected to the PC will be displayed in the lower dialog box.



🖀 Setup Ethernet	Connection	8 🛛
Select IP address		1
IP Address:	0 190 65 10 Ping	<u>C</u> lose
Assign new static IP	address	
Subnet Mask:	255.255.255.0	
Gateway:	10.190.65.1 Assign IP address	
Host name:	EnCal 3000	
To assign a new Detected EnCal 300 # IP address		
1. 10.49.	124.232 60700235 free	
	Eind EnCal 3000's on the subnet	

If this is the GC which should to be connected to the PC, click on the founded GC

1. 10.49.124.232 60700235 free

The Following window appears:



Click OK and close the dialog **Ethernet Connection** by clicking on the **Close** button. Follow the instructions in chapter 2.3, to continue with the configuration.

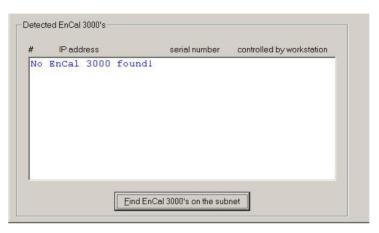
EnCal 3000 – Software Manual



2.2 Configuration with customer specific IP Settings

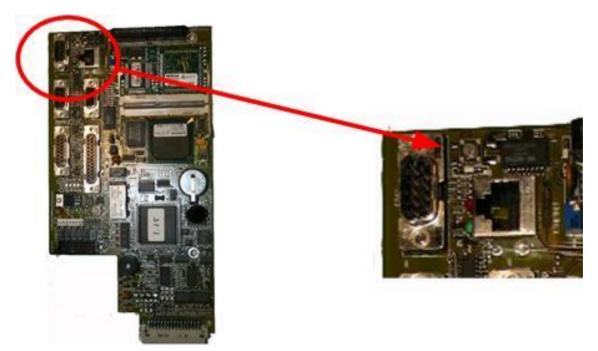
In case of the message "No EnCal 3000 found!" in the lower dialog box, there are 2 options:

- The IP address of the GC is not compatible with the IP settings of your PC. In that case new IP settings have to be assigned to the GC: see procedure on the next pages.
- Or something is wrong with the physical data communication. See Hardware manual Chapter "Hardware Installation "for the correct cabling configuration of the Ethernet cable.



Assign of an IP address with the old mainboard CP740010 (used until end of 2014):

• First the unit has to be set in BootP mode. Restart the unit while pressing the BootP button, located left above the Ethernet connector on the Processor Board





Hold the button during about 35 s, till 2 green LED's at the back of the Processor Board flash at a frequency of 1 Hz (during the start-up cycle, the 4 LED's at the back of the processor board will run continuously through a cycle of Green/Red/Orange/Green), which indicates the BootP status.

• First enter the desired IP settings for the GC in the Dialog Box and select then "Assign New Address"

ssign new static IP Subnet Mask:	255.255.255.0	
Gateway:	10.190.65.1	Assign IP address
Host name:	EnCal 3000	
To assign a new	IP address, make sure the ins	strument is started in BOOTP mode.

The IP settings will now be downloaded to the unit. This takes on average about 20s. When successful, the following message appears:

PGCCon	fig 🛛 🔀
1	Succesfully assigned IP address 10.16.0.21 to ethernet address 0.E0.4B.C.89.F9
	ОК

Select OK

🗿 Setup Ethernet	Connection		8 🛛
Select IP address IP Address:	0 190 65	10 Ping	<u>C</u> lose
Assign new static IP	address	,	
Subnet Mask:	255.255.255.0		
Gateway:	10.190.65.1	<u>A</u> ssign IP address	
Host name:	EnCal 3000		
To assign a new	IP address, make sure the in	strument is started in BOOTP mode.	

Close the dialog box "Ethernet Connection".



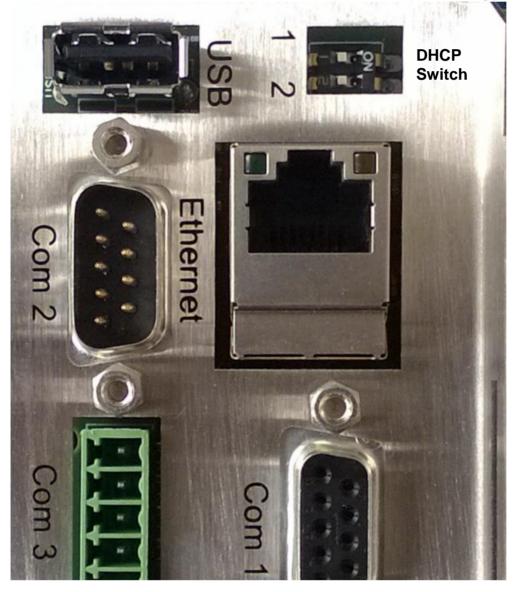
Assign of an IP address for an Encal3000 with new main board (type G3581-65000 used from the beginning of 2015)

For the new version of the main board the procedure for changing the IP address is different from the older version of the main board, for which the process has been described in the last section. The main board is delivered with a default IP address, which can always be adjusted again by continuously pressing the reset button for at least 3 seconds. This default address is:

Default IP address	192.168.100.100
Subnet mask	255.255.255.0
Host name	microgc
Default Gateway	N/A (not used)

The following steps are to be observed when changing the IP address with a new main board:

1. Check whether there is the DHCP switch (DHCP switch) in the left position (and thus is set to off). The DHCP switch is located on the back of the main board (see following picture).





- 2. Change the IP address of your laptop or PC to an address in the same range as the current IP address as the Micro GC.
- 3. Start up your web browser.
- 4. Connect to the Micro GC's website. Type the IP address of the Micro GC in the address field of the web browser. If no address is known, the standard adress shown in the last table can be set (press the reset button for at least 3 seconds). The Reset button is located at the bottom left on the board.
- 5. On the web page, click **Network**.
- 6. Log in as administrator, fill in the dialog as shown below (the real program displays the password as points).

indows Security	×
The server 192 username and	.168.1.10 at Web Server Authentication requires a password.
	server is requesting that your username and password be sure manner (basic authentication without a secure
	admin agilent Remember my credentials
	OK Cancel

7. In the network webpage, the upper section shows the current IP configuration. Type the **IP Address**, **Subnet mask,** and **Gateway** you want to assign to the Micro GC in the corresponding fields.

490 Micro GC - Windows Inter		✓ 42 X Google		
Favorites Ag0 Micro 0				
Sec. and sec.				
Agilent le	chnologies	490 Micro GC		
	Configuration: Netw	jork - Overview		
atus				
i <u>strument</u> rmware	The overview below s configuration was obt	shows this instruments currently active network configuration and how thi tained.	S	
	5			
ontrol eset	Configuration source MAC Address	Kernel command line, DHCP or BootP 00:30:D3:21:09:34		
	IP Address	156.141.90.206		
onfiguration etwork	Subnet mask	255.255.255.0		
ames	Default gateway	156.141.90.1		
aintenance				
<u>pdate</u>	Configuration: Netw	vork - Manual configuration settings		
e rvice pload	Below shows this inst	Below shows this instruments manual TCP/IP configuration parameters can be altered.		
		le is active, configuration parameters will be saved, but remain inactive u		
Jpport gilent		vated. DHCP mode can be activated and deactivated using the DHCP DIP ainboard. After operating DHCP DIP switch, a restart (warm or cold) is rec		
		le is <i>not</i> active, newly saved configuration parameters will be active to loss of connection with this web page and workstations. If this occurs	s this	
		tacted again on the newly saved IP address.	,	
	Note 3: Check if DHC	CP mode is active or inactive by opserving the <i>Configuration source</i> in the	l.	
		e <i>Configuration source</i> is <i>DHCP</i> , DHCP is active. If it is <i>Manual</i> , manual e, hence DHCP is inactive.		
	IP Address	192.168.100.100		
	Subnet mask	255.255.255.0		
	Default gateway	192.168.100.1		
	Default gateway			

8. Click **Save** to save the applied IP configuration. This IP address is now the active IP address. Communication with the Micro GC will be lost, since the active IP address has changed. To re-establish communication, type the new saved IP address in the web browser address bar, and click **Activate Communication.**

elster



2.3 Upload of GC Configuration

In the next screen, select "Upload" to upload the configuration data of the GC to the PC.

Before upload:

ernet Communicat	ion Setup			S	ervices
Address: 10	49 1	24 232	Setup IP address		Calibrate pressure sensors Reboot EnCal 3000
nfiguration settings					
Hardware		User	RGC 3000	Automatio	n Info
	<u>GC Channel</u>	Heated Injector	Backflush to vent	Max. column temp. [*C]:	Detector
Channel 1:	🔽 Installed	🔲 Installed	Installed	180	TCD
Channel 2:	🔽 Installed	🔲 Installed	Installed	180	TCD
Channel 3:	✓ Installed	🔲 Installed	Installed	180	TCD
Channel 4:	🔽 Installed	Installed	Installed	180	TCD
Common:	☐ Heated sam	ple line			
Available licens	:es:				
	PR0 Licens	e 🕅 Ene	ergy Meter option	API chapter 2	1
	🥅 Modbus seri	al 🗌 Mo	dbus TCP/IP	Veb server	
🔲 Virtual EnC	al 3000				
rument serial numb	per:			Upload Confi	g <u>R</u> eset Config

After upload:

Address: 10		49 124	232		≧etup IP address			alibrate <u>p</u> re: Reboot Er	nCal 3000
figuration settings Hardware		(i	lser) F	AGC 3000) Ai	tomation	Υ	Info
	GC C	hannel	Heated Inject	tor Ba	ackflush to vent	Max. colu temp. (*C)	mn Del	ector	
Channel 1:		istalled	✓ Installed		Installed	160			-
Channel 2:	🔽 In	istalled	✓ Installed		Installed	180	TC		-
Channel 3:	E in		Installed	Г		180	- '		
Channel 4:	🗆 İn	istalled	Installed	Г	Installed	180	1		
<u>Common:</u>	Пн	eated sample	line						
Available licen	ses:								
	PI PI	RO License		Energy N	leter option	🔽 API d	hapter 21		
	м М	lodbus serial		Modbus	TCP/IP	Veb:	server		
🔲 Vitual EnG	al 3000								
ument serial num	ber:	6070023	5			Uploa	d Config	<u>R</u> eset (Config

The software automatically detects the number of analytical channels are present in the device and displays this on the Hardware tab, as shown in the examples above.



Select **User**, here for each channel, the carrier gas used can be selected.

Hardwa	re	User	RGC 3000	Automation	Info	
	<u>Channel disabled</u>	<u>Carrier qas</u>			Download	
Channel 1:	🔲 Disabled	Helium	<u>•</u>		Download	
Channel 2:	🔲 Disabled	Helium	•			
Channel 3:	🗖 Disabled	Helium	V			
Channel 4:	🗖 Disabled	Helium	-			
<u>Common:</u>	✓ Continuous flo Peak simulatio Flush cycles: No		Ī	Activated Licenses: PRO activated Energy-Meter option a API 21 logging option		

The number of Flush Cycles and the use of "continues flow" or "peak simulation" can be selected.

Typically, the device operates with **continues flow** without **peak simulation** and has the **Flush cycles** setting "**None**".

Make the settings as described and illustrated.

Then click on the **Download** button (in the same tab). In the case that the number of **Flush cycles** already is set to "**None**", no changes are necessary.

Select tab PROstation respectively RGC 3000

Hardware		User	RGC 3000	Automation	Info
	Description:				
Channel 1:	CP-4900 Co	olumn Module, 40cm HSA	A Heated I		
Channel 2:	CP-4900 Co	olumn Module, 5CB Heat	ed Inject		
Channel 3:					
Channel 4:					
	,				
Common:					
Pressure units:	kPa	•			
User Applicatio	n Settings:				
Instrument #:	1	<u> </u>			



The types of channels used / analytical columns are displayed on this page

Select tab Automation

🎒 EnCal 3000 Configuration (Admin)		
Ethernet Communication Setup	Setup IP address	rate <u>p</u> ressure sensors
Configuration settings	B	eboot EnCal 3000
Hardware User	PROstation Automation	Info
I/O: To be used Available Alarm Relays: 3 8 Timed Relays: 3 3 Digital Inputs: 3 3	Stream Selector Streamer Type: Relays (solenoids) ▼ Number of Streams: 8 Stream Selection requests from a host system 	Download
Analog Outputs: 0 0 Analog Inputs: 2 6		udrate: 9600
Extension board detection: Board#: O Address: 1 Next		tabits: 8 pobits: 1 ity: None
Show I/O Configuration	<u>miscellaneous:</u> Postpone run till external 'Ready In'	
Instrument serial number: 61100591	<u>U</u> pload Config	Reset Config
	<u>O</u> K <u>C</u> ancel	

The information on this page is independent of the number of used channels.



Select tab Info

Co	nfiguration settings						
ſ	Hardware	Ť	User	R	GC 3000	Automation	Info
	EnCal 3000 MPU: I/O Controller: <u>RGC 3000</u> InstDataExchar Gc_dll.dll:	2,20	are version) build 22375 1,15 3,00 build 004 1,40 build 002	Channel 1: Channel 2: Channel 3: Channel 4:	Firmware I/O Ext. 1,00 1,00	Serial# Analy.I Module 60156 61113 -	Part number# 490103 74136350 -
Ins	trument serial numb	er:	61000486			Upload Config	<u>R</u> eset Config

This tab shows the version number of the installed software.

In the shown example software version 2.20 build 22375 is installed with the Firmware 1.00 (on each modules of the chromatograph).

Additionally the serial number (Serial Analy. I. Module) and the Part number of the modules are shown.

The version of the RGC 3000 software (ProStation) is also specified.

Note: References in this guide addresses and version numbers are for example only.



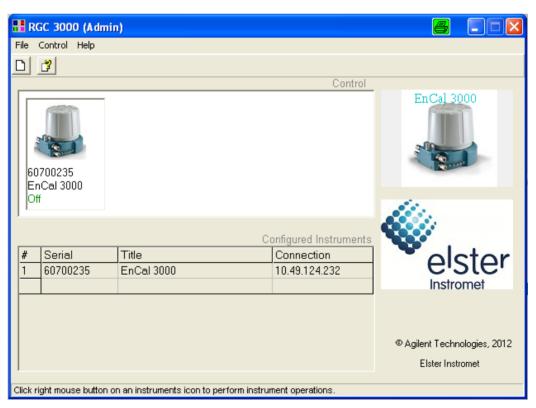
Click on **OK** in the in the lower part of the window

Instrument serial number: 60700235		Upload Config <u>R</u> eset Config	
	<u>D</u> K <u>C</u> ancel		

The window "Configure Instrument" displays the unit that is currently connected to the PC.

Configure Instruction	ument	6 🛛
Instrument Type:	EnCal 3000	Configure
Serial Number:	60700235	
Title:	EnCal 3000	
OK	Cancel	

Select "**OK**" again. Than the Instrument Selection menu appears again, displaying the unit currently connected to the PC.



The software configuration of the EnCal 3000 on the PC is now ready. To install another unit on your PC, select "**New Instrument**" under "**File**", and run through the same procedure.



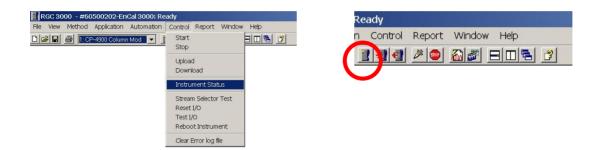
3 Overview of the Main Functions

3.1 Introduction

This section gives an overview of the most important menus. Each menu will be described in detail in the following chapters. This chapter however will allow the operator to do the basic operations, and get a first feel & look of RGC3000.

3.2 Instrument 'Status'

Instrument Status (activated through menu **Control** or by selecting the corresponding icon) displays the actual status of the device



Instrument Status has typically the following appearance:

			Enhanced						
Automation:									
State: Idle			Run II) #:	0				
Sample type: Analy	sis		Seque	ence line #:	0				
Sample stream #: 0	0			eplicate #:	0				
Flushing time:			Seq. r	epeat #:	0				
Calib.Level.: 0									
<u>GC:</u>									
Instrument State:		Ready							
Sample line temp [°C]:		n/a							
Error Status:		'Init passed'							
<u>GC channel:</u>	Chan		Chanr			Chan		Chan	
	Set	Act	Set	Act		Set	Act	Set	Act
	60	60.0	65	65.0		n/a	n/a	n/a	n/a
Column temp. [°C]:		50.0	50	50.0		n/a	n/a	n/a	n/a
Column temp. [°C]: Injector temp. [°C]:	50		440	110.8		n/a	n/a	n/a	n/a
		110.3	110	110.8					

The green colour indicates the user defined set-points. Actual values are displayed in blue in case they are within the internally defined limits of the device, and in red if outside these ranges.

Status gives a first overview of the unit, and allows the user to check quickly the pressure and temperature settings. It also gives an overview of the current analysis, analysis time, current stream and next stream. It is typically the first verification of the overall analyser status.



Protection of the Parameter settings in Instrument Status

In the enhanced instruments status the cabinet temperature, -pressure, the voltage for the power supply and the method protection are visible. If the method protections is "On (Locked)" like in the following picture, it is not possible to download changed parameter settings to the device.

Instrument Status					×
Instrument	Y	Enha	nced		_
Instrument Power Supply [V]: Battery 1 Supply [V]: Battery 2 Supply [V]: Cabinet temp. [*C]: Cabinet pressure [kPa]: Method Protection:	11,9 n/a n/a 26 100,4 On(locked)	Enhar Analog in #1: Analog in #2: Analog in #3: Analog in #4: Analog in #6:	nced 0,0000 0,0000 0,0000 0,0000 0,0000	External Ready In: n/a External started: False Digital Input received: 000	

If the method protection is "Off (unlocked)" like shown in the following picture, it is possible to download changed parameter settings like for example a changed sequence as described in chapter 3.5.

Instrument Status					
Instrument		Enha	nced	٦	,
Power Supply [V]: Battery 1 Supply [V]: Battery 2 Supply [V]: Cabinet temp. [*C]: Cabinet pressure [kPa]: Method Protection:	11,9 n/a n/a 26 100,4 Off (unlocked)	Analog in #1: Analog in #2: Analog in #3: Analog in #4: Analog in #5: Analog in #6:	0,0000 0,0000 0,0000 0,0000 0,0000 0,0000		n/a False DOO
	1				



3.3 Start (Control)

Start (activated through menu **Control** or by selecting the corresponding icon) allows to start a sequence or a single analysis.

RGC 3000 - #60500202-EnCal 300 File View Method Application Automa	
D B 1: CP-4900 Column Mod	n Control Report Window Help
	Download
	Instrument Status Stream Selector Test
	Reset I/O Test I/O
	Reboot Instrument Clear Error log file
	Lea Lito log ire
🖉 Start	
Parts -	Chromatogram file prefix: Run_
Ful	I Automation Maximum runs to keep: 0
	Set Date-Time Export file sample results: Export txt
	jenporente
	Stream Position:
Sir Sir	ngle Run
per su	igie Run Sample type: Analysis
Re Re	ecalculate Current Run
E	xecute Calibration Block only Execute Verification Block only
E	xecute Single Sequence Line Line#: 0
F	Recalculate Reprocess List Column Reconditioning
F	Recalculate Calibration Curve Action: No additional action
-	



Full automation starts the analysis series that was set in the menu **Sequence** and is used for continuous analysis of a series of sample gases (for more information see Section 4.2)

Single Run starts in this example, an analysis of measurement path 1. By "Sample type" the options Calibration, Blank and Verification can also be chosen.

If a run is selected by **Single Run** and the measurement path is changed the following message will appear:

Start Sir	ngle Run 🗙
1	Sample stream 1 is activated. Wait till the new activated stream is equilibrated. Then Press <ok> to start run.</ok>
	ОК

This message will remind you to wait until the newly activated measurement path is in equilibrated.

This time allows the unit to purge first the tubing with the sample gas before actually injecting into the column.

Wait at least 60 s to allow sufficient purging of the unit.

After this time click on **OK**, to start an analysis.

With **Execute Calibration Block only** a calibration can be started as configured in the menu "**sequence /** calibration table".

With **Execute Verification Block only** a test gas measurement can be started as configured in the menu "sequence / verification table".

Make sure that the gas with the correct pressure settings is connected on the gas chromatograph

Carrier gas	5-6 barg (71-86 PSIg) Recommended pressure 5.5 barg (80 PSIg)
Sample gas	1-4 barg (15-57 PSIg)
Calibration Gas	1-4 barg (15-57 PSIg)

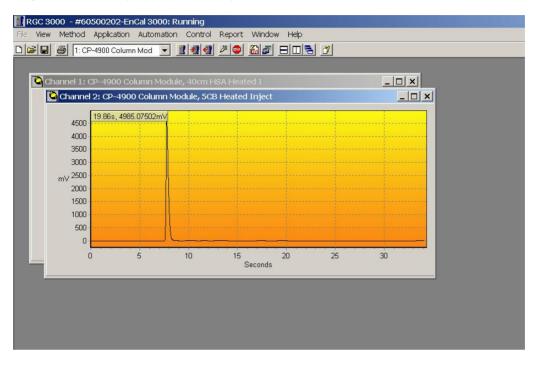
(For more details see Encal3000_Hardware_Manual, chapter 5).



3.4 Chromatogram

Once a **Run** is started, automatically chromatograms (one per channel) will be displayed.

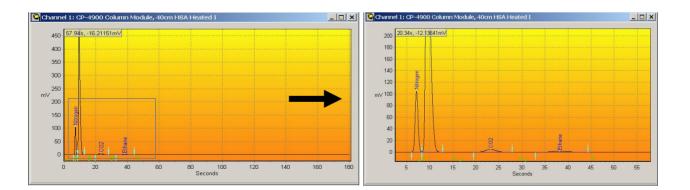
The chromatograms will initially appear randomly on the screen.



The view of a chromatogram can zoom (ZOOM IN), by:

- either with the right mouse button invokes the **Zoom**-Menu,
 - or by raising a square. Therefore hold the left mouse button pressed and begin in the upper left above the area to be magnified.

Сору	to Clipboard
Zoom	10 ×
Zoom	$100 \times$
Zoom	500 ×
Zoom	$1000 \times$
Zoom	5000 ×
Zoom	$10000 \times$
Unzoo	om 2 ×
Unzoo	om 10 x
Unzoo	om 100 x

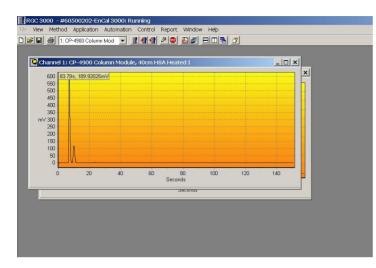


The view can be scaled with the same actions and (**(ZOOM OUT)**. Make sure that you start the bottom right, if you use the drag function of the mouse to display the entire chromatogram on the screen.

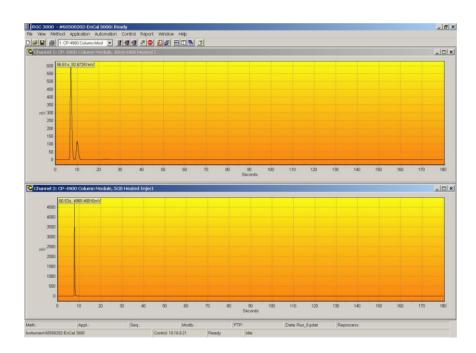
EnCal 3000 – Software Manual



Select the chromatogram of channel 1 and then the Horizontal Tile button to have them equally distributed over the screen, with Channel 1 on top.

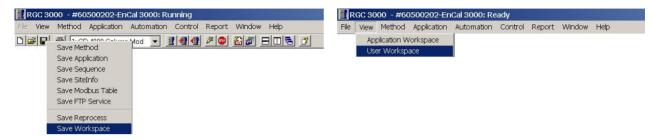








Use the menu item **Save Workspace** (to open the menu with the right mouse button click on the disk icon), this arrangement can be stored on the hard drive. Later, when you click on the menu item **User Workspace** in the View menu, this arrangement (or another custom arrangement) is retrieved and displayed.



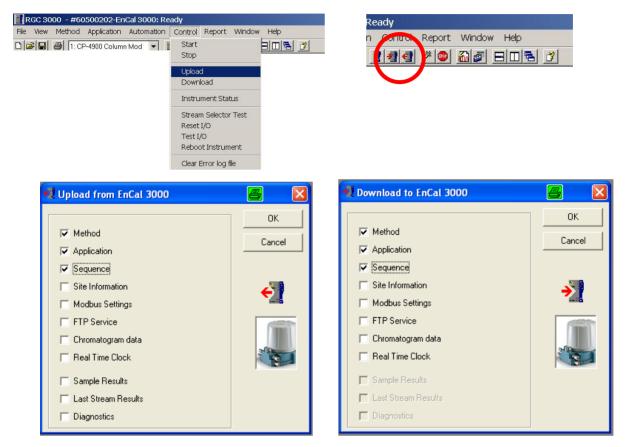
When you click the menu item **Application Workspace** in the **View** menu, the following pre-arrangement is shown on the screen.

Deprint Status Instrument Status SAMPL ENERGY ENERGY ENERGY Enternation SAMPL Concressibly 0.9579 Serving Tar. Enternation Enternation Sampling Tar. Concressibly 0.9579 Serving Tar. Enternation Enternation Sampling Tar. Adaption Concressibly 0.9579 Serving Tar. Enternation Enternation Sampling Tar. Non-Robin Val 1 Main Mass Raio 0.65209 Serving Tar. Concrete Status Discrete St												Column Mod 💌 📋	1: CP-4900 C	8	נ 🖻
sereins The 05/10/2012 14/16.34 Calc Method 10 0.97% Sereins A tim Number 16 Compressibility 0.95% Sereins A abbrail 1.1 Methods 11 182.239 Sereins A abbrail 1.1 Methods 12 12.239 Sereins A 1 Notes 1.1 Methods 12 12.239 Sereins 12.339 Sereins A 1 Notes 1.1 Methods 12 12.239 Sereins 12.339 Sereins A 1 Notes 1.1 Methods 12 12.239 Sereins 12.339 Sereins 12.33						tatus	\rm Instrument Sta						n Report	plicatio	i A
Number 16 Corporeshilly 0.99799 Sampling A In Type Analysis Mole Mass 18.62209 Sampling A Markets 1 Mole Mass Table 0.6400 Sampling A Barsishun 0K Abzonniky 0.64417 Sampling A Markets 10.62207 Sampling A Sampling A Markets 10.62211 Cable Net - Sec repost # 0 Markets 10.62211 Cable Net - - Sec repost # 0 Markets 10.64417.0560 Wobbe Sup 11.27222 Diala Int Type - - - Sec repost # 0 Markets 10.64217.0560 Wobbe Sup 11.2722 Diala Int Type - <t< td=""><td></td><td></td><td>ed</td><td>Enhanced</td><td></td><td>ument</td><td>Instrur</td><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>			ed	Enhanced		ument	Instrur	_							
No. Type Andyrin: Modar Mass: 18.5200 Samelrop A. Abbrahr Level 1 Modar Mass: 18.5200 Samelrop A. Abbrahr Level 1 Modar Mass: 18.5200 Samelrop A. Mars Matal 0.6400 Samelrop A. Samelrop A. Mars Matal 0.6400 Samelrop A. Samelrop A. Mars Matal 0.6 Abbrahr Pre- Or 7 Line repolate R 0 Mars Matal 0.0000 Hi 9.05116 Anthorn Pre- Or 7 Line repolate R 0 Van Peaka 26 Workel rd 1.12722 Datal m R2 Or 7 Line repolate R 0 1 Minopen 158683 1194978 5.82 13641282544 Or 7 Datal m R2 1 Minopen 19.36837 19.4978 5.82 1364128254 Or 7 No.2758455 3 DO2 1402546 144221 Datal m R2 Datal m R2 Oarner 1 Oarner 1 Oarner 1 Oarner 1 1 Minare 0.002586												2012 14:16:34			
uh 1y2e Adagysis micka hash 16,86,309 Sateling Adagysis Sequence for £ 0 beam H 1 McBorniky 0,64300 Sameling Adagysis Sequence for £ 0 sime Subaco 0 K Abborniky 0,62327 Sameling Adagysis Sequence for £ 0 sime Subaco 0 K Abborniky 0,62327 Sameling Adagysis Sequence for £ 0 um Etholes 0,000 H 5,0016 Anher for bornik 0 0 um Atexis 0,000 H 5,0016 Anher for bornik Ready 0 other for bornik 0,000 H 1,00211 Cabent for bornig Ready other for bornik 0,000 H 1,00211 Satel 2,021 Diskin Htt.* 0 1 Nikoogen 11,06845,012 2,57 798/95,0584 1 1 2 Methore 0,0214731 262,22149 2,57 798/95,0584 1 20 6,0 86 6,0 0,0 3 1 0.022 1,40256 1,44256 2,31			oorted run #: 68	Last repo		Idle									
Image: 1 Ref Dendy 0.54417 Sampling A Image: 1 Ab: Dendy 0.82327 Sampling A Image: 1 Ab: Dendy 0.82327 Sampling A Image: 1 0.000 Hi 500/11/2 Image: 1 1 1 0.000 Hi 500/11/2 Image: 1 1 1.002 1.002 1.002 1.002 Image: 1 1.002 1.002 1.002 1.002 1.002 Image: 1 1.002 1.002 1.002 1.002 1.002 1.002 Image: 1 1.002 <td></td> <td></td> <td>ice line #: 🚺</td> <td>Sequence</td> <td>3</td> <td>Analysis</td> <td>Sample type:</td> <td></td> <td></td> <td></td> <td></td> <td>s</td> <td></td> <td></td> <td></td>			ice line #: 🚺	Sequence	3	Analysis	Sample type:					s			
am Statu: DK Ab.Density 0.83287 Samping A m ESTD 97,2470 Hs 1002711 Caber Te m ESTD 97,2470 Hs 1002711 Caber Te m Area 1048417,0840 Wobb Sup 12,49321 Digital nt m Area 1048417,0840 Wobb Sup 12,49321 Digital nt 1 1 Neogen 1158683 11,914978 5.82 1 1 12772 Diatal nt Z- 1 1 Neogen 1158683 11,914978 5.82 1 1002 - 14,002541 14,273 1282,814 2 1 Methane 03,347591 82,62749 7.87 19828,8865 1 19828,5142 2 1 Neopen 04,347791 82,62749 7.87 19828,5865 2 18,044me 00,75840 1442231 2014 112772 4225,2372 2 2 Propare 0,439777 05,0164 14,73 2008,0122 3 2 rites Team 0,099328 10,9382 18,46 986,0072 8 2 rites Team 0,099328 10,9382 18,46 986,0072 9 7,755 n/a Channel 1: CP-4900 Column Module, 40cm H5A Heated 1 Channel 1: CP-4900 Column Module, 40cm H5A Heated 1 Channel 1: CP-4900 Column Module, 40cm H5A Heated 1 Channel 1: CP-4900 Column Module, 40cm H5A Heated 1 Caber CP Status 10,09930 00149 12,32 139,94828 14 0 0005800 002378 2,373 16,82,8271 0 0 0005900 00149 12,32 139,94828 1 0 0005900 00149 12,32 14,32 14,348 14 14,348 14 14 14 14 14 14 14 14 14 14 14 14 14					7	* 0 7									
sim ESTD 97,2470 Hs 1002711 Cabinet Te Ministratione sim Estimate 0.0000 Hi 90,6116 Anthein Pro- Bargels Inte temp (°C) If any and the temp (°C) If any			Jeal #. U	Seq. repe		0									
mi stimole 0000 Hi SUDO 12452 mi Araben 102417 2940 Wobbe Sup. 124521 pal Peaks 26 1 Mehrine Peaksame 1 Nacyon 11595651 1131478 582 2 Nephrine Peaksame 1 Nacyon 11595651 1131478 582 2 Nephrine Peaksame 2 Nephrin							GC:					0			
minices 104417/0540 wobbe fun 11 2722 Diakai in fl barrel Peakrame ESTO Conc. Nom. Conc. Retenion (a) Area 1 Natogon 1158983 11314970 582 138412.6264 2 1. Mechane 80.34751 82.62143 7.67 798756.885 3 1 CO 2 1 Mechane 3121543 3209311 32.77 47235.2372 2 2 Propane 0.489777 0.503842 14.73 26090.6122 5 2 Propane 0.079580 0.000618 19.28 0489.00072 5 2 n Bulane 0.07580 0.000618 19.28 0489.0027 5 2 n Retare 0.005380 0.0006143 19.28 0498.0207 7 2 n Retare 0.005380 0.0006143 19.28 0498.0207 7 2 n Retare 0.003006 0.002373 1628.2571 7 2 n Retare 0.003006 0.002373 1628.25							Instrument State:								
Deaks 25 Wobbe Inf 112722 Deaks in fil2 I In Nitogen 1158683 1191479 Siz 136412624 1 I Nitogen 1158683 1191479 Siz 136412624 1 I Nitogen 10262 1402546 1442251 2014 195285122 1 I Ethane 3121543 3203911 22.77 47255.237 2 Propane 0.043770 0.0503842 14.73 2600.01512 6 2 JBuane 0.078640 0.08086 16.85 4680.0034 2 Incernate 0.003882 10.23.73 23.73 1628.2571 2 Incernate 0.023086 0.023738 23.73 1628.2571 2 Incernate 0.023086 0.023738 23.73 1628.2571 2 Incernate 0.023086 0.023738 23.73 1628.2571 2 Incernate 0.0230738 0.023738 23.73					n/a	ə ["C]:		Digital in #1	321	12	Wobbe Su	17,0840	1048417	reas	um A
Channel 1 Channel 1 Channel 2 Channel 3 2 1 Nethone 90347531 82,622149 2,67 29375,6565 Set Act Se							Endr Status.	Digital in #2 💌	22	11	Wobbe Inf.		26	Peaks	otal
1 Nitogen 11.580683 11.314978 5.82 136412.524 136412.524 Set Act								Area 🔺	etention [s]	lorm. Conc.	ESTD Conc.		Peakname	Channel	#
2 1 Mehane 80.347591 82.822143 7.67 789785858 3 1 C02 1.402546 1.442251 20.14 19628.8142 5 2 Propane 0.489777 0.50342 14.73 26990.6122 6 2 reporte 0.489777 0.50342 14.73 26990.6122 7 2 r.Phutane 0.005860 0.006149 19.28 39.4628 8 2 iPentane 0.005860 0.023738 23.73 152.8271 -47.967 9.756 n/a V - - - -47.967 9.756 n/a -47.967 8 2 iPentane 0.005860 0.006149 19.28 398.4628 - <td< td=""><td>Channel 4 Set Act</td><td></td><td></td><td></td><td></td><td></td><td>GC channel:</td><td>136412,6264</td><td>82</td><td>1,914978</td><td>11,586963</td><td></td><td>Nitrogen</td><td>1</td><td>1</td></td<>	Channel 4 Set Act						GC channel:	136412,6264	82	1,914978	11,586963		Nitrogen	1	1
1 Ethane 3,121543 3,209911 32,77 47235,2372 5 2 Propane 0,499777 0,503642 14,73 2609,06122 3 2 i+Buarne 0,0076640 0,000666 16,65 4865,00472 2 i+Buarne 0,0076840 0,00093862 18,46 5966,0472 i+Diane 3 2 i+Pertane 0,002395 0,023738 23,73 1628,2571 i+Diane Channel 1: CP-4900 Column Module, 40cm HSA Heated 1 Image: Column HSA Heated 1 Image: Column HSA Heated 1 Im	n/a n/a		80,0	80 8			Column temp. [°C]:	798795,8585	67	2,622149	80,347591		Methane	1	2
Image: Image:<	n/a n/a									,442251	1,402546		CO2	1	3
2 Progene U4897/1 U303842 14.7.3 260936122 2 Heutane 0.078640 0.080866 16.85 4689,0034 3 2 neo-Pertane 0.001288 0.033882 18.46 3896,0472 3 2 inco-Pertane 0.002305 0.023738 23.73 1528,2571 Image: Channel 1: CP-4900 Column Module, 40cm HSA Heated 1 Channel 1: CP-4900 Column Module, 40cm HSA Heated 1 Storage and a s	n/a n/: n/:					e [kPa]: 140					-		Ethane	1	_
2 rrButane 0.081288 0.093882 18.46 5866.0472 3 2 reo-Pentane 0.005890 0.006149 13.28 389.4828 3 2 iPentane 0.02306 0.023738 23.73 1528.2571 Channel 1: CP-4900 Column Module, 40cm HSA Heated 1 Image: Channel 2: 8m 5CB Heated Injector, for Instromet		11/ 4	0,730	í v	-47,007		Adiozoro (http:				-			-	_
8 2 neoPentane 0.005980 0.006149 19.28 389.4628 9 2 iPentane 0.023085 0.023738 23.73 1628.2571 I Channel 1: CP-4900 Column Module, 40cm HSA Heated I I I I Image: Channel 2: 8m 5CB Heated Injector, for Instromet 500 281.79s, 164.8223mV Image: Channel 2: 8m 5CB Heated Injector, for Instromet Image: Channel 2: 8m 5CB Heated Injector, for Instromet 450 Image: Channel 2: 8m 5CB Heated Injector, for Instromet Image: Channel 2: 8m 5CB Heated Injector, for Instromet 500 281.79s, 164.82233mV Image: Channel 2: 8m 5CB Heated Injector, for Instromet 500 281.79s, 164.82233mV Image: Channel 2: 8m 5CB Heated Injector, for Instromet 500 281.79s, 164.8223mV Image: Channel 2: 8m 5CB Heated Injector, for Instromet 500 Image: Channel 2: 8m 5CB Heated Injector, for Instromet Image: Channel 2: 8m 5CB Heated Injector, for Instromet 100 Image: Channel 2: 8m 5CB Heated Injector, for Instromet Image: Channel 2: 8m 5CB Heated Injector, for Instromet 100 Image: Channel 2: 8m 5CB Heated Injector, for Instromet Image: Channel 2: 8m 5CB Heated Injector, for Instromet											-			-	_
9 2 iPentane 0.023738 22,73 1628,2571 image: constraint of the state of the sta											-				
Channel 1: CP-4900 Column Module, 40cm HSA Heated 1								000.0574			-			-	_
Channel 1: CP-4900 Column Module, 40cm HSA Heated 1									5,73	,023738	0,023085		I-Pentane	2	
550 281,73s, 164,82233mV 450 67,4s, 3868,23801mV 400 950 400 950 300 950 300 950 100 150 100 500 500 100 500 500				for Instromet	d Injector,	5CB Heated	Channel 2: 8m 5			I	cm HSA Heated	olumn Module, 4	: CP-4900 Col	annel 1	
29/,98,104 ac23mV 67.8, 388,230/mV 450 350 460 350 300 350 100 100 50 100 50 100 50 500														550 -	
450					1	3868,23901mV						3mV	1,79s,164,82233r	29	
400 300 300 300 300 300 300 4 50 500 500 500 500 500 500															
300 300 200 100 50 50 50 50 50 50 50 50 50 50 50 50 5		1	1				3500							- 11	
300 m ^V 220 200 150 500 500 500 500 500 500 500 500 5							3000								
500 1000 500 500 500 500 500 500			l				2500							- 11	
															-
							2000							- 18	mv
					e.		1500							200	
					e e		1000							150	
	2		2	0 2	yclot	ee e							w	100	
	<mark>8</mark>		ģ		tept - the		500							50	
			4	11 firt -		10 1 111 m141	0						A L	0	
	Ĕ		-				111.11						21 ST 1		
	Ĕ	200 250	50					300	260	200	150	1 400			



3.5 Upload / Download

These menu items on the **Control** menu allow the operator to import data from the gas chromatograph to the hard disk (**upload**) or modify configuration settings, and then export to the process gas chromatograph (**download**). **Caution: Concepts / direction not to be confused with the actions on the Internet.**



Typically, the import the configuration settings from the chromatograph to the PC part of the start-up routine. Data's are stored under **Method**, **Application**, and **Sequence**.

Once the various configuration files are imported (**upload**), they must be stored on the PC hard drive under a defined name as a backup.

By default, they are stored in the directory which is automatically created on the hard disk with the serial number of the connected unit as name.

Save Method	? X KGC 3000 - #60500202-EnCal 3000; Ready
Save jn: 🗀 Method 💽 🔶 🖆 🖽 🔻	File View Method Application Automation Control Report Window Help
Pecent Default.pmet Desktop Default.pmet Default.pmet Default.pmet	Save Method Save Application Save Sequence Save StreInfo Save Reprocess Save Workspace

EnCal 3000 – Software Manual



3.6 Window Instrument Setup (Menu Method)

The window Instrument Setup is found under menu point Instrument Setup in menu Method



Instrument Setup allows configuration of channel temperature, head pressure, run time and other parameters. The number of tab sheets depended on the number of channels.

🔥 Instrument Setup		
Channel 1 🚫 Channel 2	Common	

Tab Sheet Channel (1 – 2)

Column temperature:	65 °C	Bun tim	e: 180	Sec
Injector temperature:	70 °C			
Inject time:	110 mSec			
Backflush time:	n/a Sec			
Detector state:	🔽 On			
TCD temp. limit check:	🔽 On			
Sensitivity:	Auto 🔽 🗖	nvert signal		
Pressure mode:	Static C Programm	ned		
Initial pressure:	150 kPa			
		Carrier Gas	p ronom	
		Channel de	escription: CP-4900 Column N	Aodule, 40cm HSA Heate



Tab Sheet Common.

Sample time:	0	Sec
Sample line temperature:	n/a	°C
Stabilizing time:	0	Sec
Continuous Flow:	Enabled	
Flush cycles:	0	
Peak Simulation:	Disabled	



3.7 Window Integration events (Menu Method)

The window Integration events is found under menu point Integration events in menu Method

🔣 RGC 30)00 - #60700235-EnCa	l 3000: Ready
File View	Method Application Auton	nation Control Report Window Help
	Instrument Setup Integration Events	▥▾ ▮◢◁ 拳● ẫਛ ⊟⊓≒ ↗
1	Peak Identification Peak Calibration	
	Advanced	
1	Properties	-

Integration events contains a list per channel of integration actions which have to be taken during the analysis. The submenu is illustrated in the following chapters.

#	Active	Event ID	Start Time	Value
1	\checkmark	14. Turn Integration Off	0	0
2	\checkmark	10. Set Minimal Area	0	100
3	\checkmark	1. Set Peak Width [s]	0	1,5
4	\checkmark	2. Set Threshold [10 nV]	4,5	1
5	\checkmark	13. Turn Integration On	5	0
6	\checkmark	3. Double Peak Width Now	15	0
7	\checkmark	2. Set Threshold [10 nV]	15	1
8	\checkmark	2. Set Threshold [10 nV]	28,5	0,5
9	\checkmark	14. Turn Integration Off	60	0

		on Events: Channel 2		
#	Active	Event ID	Start Time	Value
1	\checkmark	14. Turn Integration Off	0	0
2	\checkmark	1. Set Peak Width [s]	0	0,5
3	\checkmark	10. Set Minimal Area	0	5
4	\checkmark	13. Turn Integration On	14	0
5	\checkmark	22. Baseline Valley To Valley On	14	0
6	\checkmark	2. Set Threshold [10 nV]	14	1,5
7	\checkmark	23. Baseline Valley To Valley Off	15,8	0
8	\checkmark	2. Set Threshold [10 nV]	15,8	1,5
9	\checkmark	3. Double Peak Width Now	17,73	0
10	\checkmark	2. Set Threshold [10 nV]	17,73	0,05
11	\checkmark	2. Set Threshold [10 nV]	30	0,05
12	\checkmark	1. Set Peak Width [s]	45	3
13	\checkmark	2. Set Threshold [10 nV]	45	0,01
14	\checkmark	2. Set Threshold [10 nV]	127	0,007
15	\checkmark	1. Set Peak Width [s]	275	5
16	\checkmark	14. Turn Integration Off	300	0

EnCal 3000 – Software Manual



3.8 Window Peak Identification (Menu Method)

The window **Peak Identification** is found under menu point **Peak Identification** in menu **Method**

🔣 RGC 30	000 - #60700235-EnCa	l 3000: Ready
File View	Method Application Autom	nation Control Report Window Help
	Instrument Setup Integration Events	1₀₫ 👤 📲 🥙 🌌 🖉 🗏 🕅 🗮 🙎 🚺
	Peak Identification	
	Peak Calibration	
	Advanced	
	Properties	

Peak Identification contains a list of peak parameters (retention time, cal gas concentration, response factor etc.) for each channel. The submenu is illustrated in the following chapters.

R P	eak Ide	ntification / Calibra	tion: Chan	nel 1									
#	Active	Peak Name	ID	Ret.Time	Rel.Ret.Window	Abs.Ret.Window	Reference	Selection Mode	Rel.Ret.Peak	Level 1	Level 2	Level 3	Leve
1	\sim	Nitrogen	1	6,067021	5	5		0. Nearest		4,02	0	0	0
2	\checkmark	Methane	2	7,584883	5	5		0. Nearest		88,80353	0	0	0
3	\checkmark	C02	3	20,38294	5	5		0. Nearest		1,51	0	0	0
4	\checkmark	Ethane	4	33,36982	5	5		0. Nearest		4,02	0	0	0
•									•	•			Þ

#	Active	Peak Name	ID	Ret.Time	Rel.Ret.Window	Abs.Ret.Window	Reference	Selection Mode	Rel.Ret.Peak	Level 1	Level 2	Level 3	Lev
1	\checkmark	Propane	1	15,3675	5	5		0. Nearest		1,01	0	0	0
2	✓	i-Butane	2	17,5	5	5		0. Nearest		0,201	0	0	0
3	\checkmark	n-Butane	3	19,0925	5	5		0. Nearest		0,202	0	0	0
4	\checkmark	neo-Pentane	4	19,9175	5	5		0. Nearest		0,05	0	0	0
5	\checkmark	i-Pentane	5	24,305	5	5		0. Nearest		0,051	0	0	0
6	\checkmark	n-Pentane	6	26,68	5	5		0. Nearest		0,05	0	0	0
7	\checkmark	n-Hexane	7	42,305	5	5		0. Nearest		0,051	0	0	0
8	✓	n-Heptane	8	74,355	5	5		0. Nearest		0,021	0	0	0
9	\checkmark	n-Octane	9	139,63	5	5		0. Nearest		0,0073	0	0	0
10	√	n-Nonane	10	272,1275	5	5		0. Nearest		0,0021	0	0	0



3.9 Window Peak Calibration (Menu Method)

The window **Peak Calibration** is found under menu point **Peak Calibration** in menu **Method**

🚹 RGC	3000 -	#60700235	-EnCal 300	0: Read	y			
File Vie	w Method	Application	Automation	Control	Report	Window	Help	
D 🚅	Inte Peal	rument Setup . gration Events k Identification k Calibration		- 1	ઝ ન	2	<u>a</u> 7	
	Adv	anced						
	Prop	perties						

Peak Calibration contains calibration settings and results for each channel. The submenu is illustrated in the following chapters.

🔀 Review Peak Calibration: Channel 1	
Calibration Settings	
Response Mode: Area Calibration Mode: External Standard R.F. Type: Manual and Curve Retention Update% 50 RF Unknown peaks: C Abs. C Rel.	Channel Independent Settings: Total Calibration Levels.: 1 Calibration Check: Initial Calibration: Use GOST Calibration Retention Window Update: 1. Calibration Download Calibration Curve with method:
Calibration Results Nitrogen Methane CO2 Ethane	Changelist Scale Full screen
Sample Level 1 Area (Amount) 1 49513,811069 (3,996900)	

EnCal 3000 – Software Manual



3.10 Window Advanced Settings (Menu Method)

The window Advanced Settings is found under menu point Advanced in menu Method



If reports are to be created on the hard disk, you must define the parameters to be saved in this screen. Activate Sie **Export enabled** and select the parameters to be stored on the hard drive, with the help of the black arrows. For each run, a line is added to the export file. The export file name is entered in **Start** screen (**Export file sample results**) under menu **Control**.

🕷 Method Advanced Settings		
Export to file Export to MLink32		
Export Results settings		_
🔽 Export enabled		
Export parameters available: Height Unnorm. concentration Response Factors	Selected: Retention Area Normalized conc. Energy Meter Ambient Temp., Pres.	

(Note: MLink 32, an Excel workbook can be used for the establishment of additional calculations during instruments acceptance phase. Settings are not changed.)



3.11 Window Method Properties (Menu Method)

The window Method Properties is found under menu point Properties in menu Method

RGC 3	3000 - #60700235-EnCal 3000: Ready	
File View	Method Application Automation Control Re	port Window Help
	Instrument Setup Integration Events	4 🎤 🔍 🖓 🖉 🖻 🖻 🕺
	Peak Identification Peak Calibration	
	Advanced	
	Properties	

In the window Method Properties is defined what is to be executed after a run.

4 Method Properties	
Peak Integration, Identification and Calibration calc	ulations
- 🔽 Application Calculations	
🖵 🗖 Application Use Test Amounts	

If ",,Peak integration, Identification and Calibration calculations"" is disabled, all runs are performed without calculations.

If only the top option is selected, only the data of a run become integrated. The identification of the peaks and the concentration calculations is carried out and the "Integration Report" shown

"Application Calculations" can only be activated if the first option is checked. Calculations are carried out and controlled by input / output signals. The results are entered in the "Application Report ".

The last option can be selected only if the above were elected. Calculations are performed using test sets instead of the actual calculated quantities.



3.12 Normalize and Calorific Power (Menu Application)

The table Normalize is found under menu point Normalize in menu Application



The **Application** menu includes three sections calculation information, alarms and relays. Calculation information that should be carried out with regard to the component analysis according to customer specification, either ISO, GPA, ASTM or GOST, are distributed to the tables **Normalize** and **Calorific Power**.

Table **Normalize** contains a list of available components, with channel location, estimated concentration and other parameters.

#	Active	Peak Name	Channel	Ignore	Bridge Comp #	Estimate	Estim.Conc	Test.Conc	RefConcPeak#	RefPeakConc%	Group#
1	\checkmark	Nitrogen	1		0. None	\checkmark	0	0	0	0	0
2	\checkmark	Methane	1		0. None	\checkmark	0	0	0	0	0
3	\checkmark	CO2	1		0. None	\checkmark	0	0	0	0	0
4	\checkmark	Ethane	1		0. None	\checkmark	0	0	0	0	0
5	\checkmark	Propane	2		0. None	\checkmark	0	0	0	0	0
6	\checkmark	i-Butane	2		0. None	\checkmark	0	0	0	0	0
7	\checkmark	n-Butane	2		0. None	\checkmark	0	0	0	0	0
8	\checkmark	neo-Pentane	2		0. None	\checkmark	0	0	0	0	0
9	\checkmark	i-Pentane	2		0. None	\checkmark	0	0	0	0	0
10	\checkmark	n-Pentane	2		0. None	\checkmark	0	0	0	0	0
11	\checkmark	n-Hexane	2		0. None	\checkmark	0	0	0	0	0
12	\checkmark	n-Heptane	2		0. None	\checkmark	0	0	0	0	0
13	\checkmark	n-Octane	2		0. None	\mathbf{M}	0	0	0	0	0
14	\checkmark	n-Nonane	2		0. None	\mathbf{M}	0	0	0	0	0
15	\checkmark	n-Decane	2		0. None	$\mathbf{\Lambda}$	0	0	0	0	0
16	\checkmark	Benzene	2		0. None	\checkmark	0	0	0	0	0
17	\checkmark	Cyclohexane	2		0. None	\checkmark	0	0	0	0	0
18	\checkmark	Methylcyclohexane	2		0. None	\checkmark	0	0	0	0	0
19	\checkmark	Toluene	2		0. None	\checkmark	0	0	0	0	0
20		n-Undecane	2		0. None	\checkmark	0	0	0	0	0
21	\checkmark	n-Dodecane	2		0. None	\checkmark	0	0	0	0	0
22	\checkmark	H2S	2		0. None	\checkmark	0	0	0	0	0
23	\checkmark	COS	2		0. None	\checkmark	0	0	0	0	0
24		Oxygen	2		0. None	\checkmark	0	0	0	0	0
25		Hydrogen	2		0. None	\checkmark	0	0	0	0	0
26	\checkmark	Helium	2		0. None	\checkmark	0	0	0	0	0



The table **Calorific Power** is accessed via the menu item **Calorific Power** in the **Application** menu and includes a menu of choices for the type of calculation method, the standard conditions and the type of peak grouping, and a table of calorific values, density values and compressibility (if applicable) for each component, which is selected in the **Peak Identification** menu.

E Calorific Power			
Calculation Meth	od Component Consta	ints	
Calculation Method ISO 6976 GPA 2172 ASTM D3588 G0ST-22667	✓ Sum C6+ unidentified compor Channel number C6:	2. Channel 2	
	Identify C6 component:	11. n-Hexane 💌	
Method Settings Reference Temperature: Compressibility Air (Zair):	273.15 K ▼ 0.99941		

1 2 3 4 5 6 7	Active	Component Name 1. Nitrogen 2. Methane	Index 1	Hs	Lui	-	
2 3 4 5 6 7	X X	2. Methane	1		Hi	SF	MW
3 4 5 6 7	V V			0	0	0	28,0135
4 5 6 7	N N		2	39,82	35,88	0	16,043
5 6 7	N	3. CO2	3	0	0	0	44,01
6 7		4. Ethane	4	70,31	64,36	0	30,07
7	v	5. Propane	5	101,21	93,18	0	44,097
	\checkmark	6. i-Butane	6	132,96	122,78	0	58,123
_	\checkmark	7. n-Butane	7	133,8	123,57	0	58,123
8	\checkmark	8. neo-Pentane	8	169,27	156,63	0	72,15
9	\checkmark	9. i-Pentane	9	169,27	156,63	0	72,15
10	\checkmark	10. n-Pentane	10	169,27	156,63	0	72,15
11	\checkmark	11. n-Hexane	11	187,4	173,17	0	86,177
12	\checkmark	12. n-Heptane	12	216,88	200,55	0	100,204
13	\checkmark	13. n-Octane	13	246,18	227,76	0	114,231
14	\checkmark	14. n-Nonane	14	276,33	256,23	0	128,258
15	\checkmark	15. n-Decane	15	306,48	284,7	0	142,285
16	\checkmark	16. Benzene	16	162,615	155,67	0	78,114
17	\checkmark	17. Cyclohexane	17	176,36	164,58	0	84,161
18	\checkmark	18. Methylcyclohexane	18	205,26	191,51	0	98,188
19	\checkmark	19. Toluene	19	176,26	168,18	0	92,141
20	\checkmark	20. n-Undecane	20	336,63	313,17	0	156,311
21	\checkmark	21. n-Dodecane	21	366,78	341,64	0	170,377
22	\checkmark	22. H2S	22	25,35	23,37	0	34,082
23	\checkmark	23. COS	23	24,46	24,46	0	60,076
24	\checkmark	24. Oxygen	24	0	0	0	31,998
25	\checkmark	25. Hydrogen	25	12,75	10,79	0	2,0159
26	\checkmark	26. Helium	26	0	0	0	4,0026



3.13 Verification Check and Alarms (Menu Application)

Verification Check screen is found under menu point Verification Check in menu Application

🔣 RGC 3000 - #	60700235	5-EnCal 3000: Ready
File View Method	Application	Automation Control Report Window Help
D 📽 🖬 🎒	Normalize Calorific P	
		tion Check
	Alarms	
	Timed Rel	
	Analog In	
	Digital Inp	nputs

The **Application** menu includes three sections calculation information, alarms and relays. The alarm section contains menu points **Verification Check** and **Alarms**. The window **Verification Check** consists of two tabs and set the parameter limits for the verification.

Verification Settings	Verification Table			
Verification parameters				
Verification table enabled				
erification Check				-
erification Check Verification Settings	Verification Table			_ (
	Verification Table	Minimum	Maximum	
Verification Settings		Minimum 80	Maximum 1	
Verification Settings # Active Param Type	Parameter		Maximum 1 1	
Verification Settings # Active Param Type 1 Image: 2 Normalized Amounts	Parameter 1. Nitrogen (Chan 1)	80	Maximum 1 1	

Window **Alarms** screen is found under menu point **Alarms** in menu **Application**. It consists of two tabs and set the parameter limits for the normal operation.

📥 Alarms		
Alarm Settings	Alarm Table	
Alarming parameters		



		Alarm Settings		Alarm	Table					
;	Active	Param Type	Parameter	Minimum	Maximum	Alarm On	Invert Alarm	Relay Alarm	Relay #	Invert Relay
	\checkmark	2. Normalized Amounts	1. Nitrogen (chan 1)	0	22	5. All			0. None	
2	V	2. Normalized Amounts	2. Methane (chan 1)	55	100	5. All			0. None	
	\checkmark	2. Normalized Amounts	3. CO2 (chan 1)	0	12	5. All			0. None	
ł	\checkmark	2. Normalized Amounts	4. Ethane (chan 1)	0	14	5. All			0. None	
;	\checkmark	2. Normalized Amounts	5. Propane (chan 2)	0	5	5. All			0. None	
;	\sim	2. Normalized Amounts	6. i-Butane (chan 2)	0	1,5	5. All			0. None	
,	\checkmark	2. Normalized Amounts	7. n-Butane (chan 2)	0	1,5	5. All			0. None	
:	V	2. Normalized Amounts	8. neo-Pentane (chan 2)	0	0,1	5. All			0. None	

3.14 Relays (Menu Application)

The **Application** menu includes three sections calculation information, alarms and relays. In the area there are relays the following tables:

🗄 R	GC 30	000 - #	60700235	EnCal 300	0: Read	y			
File	View	Method	Application	Automation	Control	Report	Window	Help	
D 🖻 🖬 🎒		Normalize Calorific F		- 🔡	7	2	8		
			Verificatio Alarms	n Check					
			Timed Rel	lays					
			Analog In	•					
			Digital Inp	outs					

Called up by menu point **Timed Relays** in **Application** menu:

02 Ti	med Relays				X
#	Event	Delay [s]	Timed Relay	Relay State	

Additional to **Timed Relays** the user can define **Alarm Relays** (see chapter 4.7)

Called up by menu point Analog Inputs in Application menu:

🚺 Analog	Inputs	_ 🗆 🛛
Channel	Gain	Offset
1	4,41099353734102E-302	4,61864415153757E-62
2	2,88299965706367E-144	3,23790861658519E-319

Called up by menu point Digital Inputs in Application menu:

Digital Input	Function	
Digital Input 1	0. None	
Digital Input 2	0. None	
Digital Input 3	0. None	



3.15 Sequence (Menu Automation)

RGC 3000 - #60700235-EnCal 3000: Ready						
File View Method Application	Automation Control	Report Window Help				
🗅 🚅 🔒 🎒 1: CP-4900 C	Sequence	141 🖉 📾 🖓 🖉 🖻 🗆 🗟				
	Site Information					
	Modbus Setup					
	FTP Service					
	Real Time Clock					
	Reprocess List					

The window **Sequence** determines the order of the sample gases and the calibration frequency. The submenu is illustrated in the following chapters.

Sequence		
Sequence Table	Verification Table	Calibration Table
Sequence Properties	Verification Properties	Calibration Properties
Main Sequence ✓ Auto start sequence on power-up ④ Run sequence continuously ① Times to repeat sequence Number of repeatings: 1 Run cycle time [sec]: 0 Stream Selector Home Position (on error and yhen sequence stops):	Ignore Cycle time for Verification and Calibration runs	

3.16 Modbus Setup (Menu Automation)

RGC 3000 - #60700235-EnCal 3000: Ready						
File View Method Application	Automation Control	Report Window Help				
🗅 🗃 🖶 🎒 1: CP-4900 C	Sequence	14 20 20 20 20 20 20 20 20 20 20 20 20 20				
	Site Information					
	Modbus Setup					
	FTP Service					
	Real Time Clock					
	Reprocess List					

Modbus Setup allows configuration of Modbus parameters. The submenu is illustrated in the following chapters.

🜉 Modbus Setup							
Process Settings	Registers Setup						
© MODICON © INSTROMET / DANIEL / ENRON / OMNI Synchronization with Modbus Master							
Reset-Time New Data Available flag [s]:	60						
Communication Settings	Serial communincation settings:						
Slave Address: 1	Port settings: 9600:N,8,1						
Floating Point Type Conversion	Comport Primary: 2						
Normal O Reverse	Comport Secondary: 0						
INT32 bit Type Conversion	Serial Transmission Mode						
Normal C Reverse	O RTU © ASCII						
Shift Modbus Addresses							
No Clup Cldown							



Standard Operations 4

4.1 Introduction

This menu describes standard operations which most of operators will perform on a regular base:

•	Sequence	(sample gas order)
---	----------	--------------------

- Calibration (calibration)
- Peaks (Setting the retention times)
- Verification (Verify) Alarms
 - (set the limits for alarms)
- . Modbus Setup (Setting up the Modbus table)
- Report (creating logs)

4.2 Sample gas order (Sequence)

The Automation / Sequence menu allows you to specify a particular sequence of measurement paths, calibrations and verifications.

RGC 3000 - #60700235-EnCal 3000: Ready					
File View Method Application	Automation Control	Report Window Help			
🗋 🗃 🔚 🎒 1: CP-4900 C	Sequence] 🕘 🖉 📾 🔊 🖃 🗆 🚍 👔			
	Site Information				
	Modbus Setup				
	FTP Service				
	Real Time Clock	-			
	Reprocess List				

The selection of the menu Sequence opens the following dialog box with several tabs. The Sequence is Independent of the number of channels used.

	🔀 Sequence		
	Sequence Table	Verification Table	Calibration Table
ĺ	Sequence Properties	Verification Properties	Calibration Properties

The tabs of the menu Sequence used to define the normal operating cycle. This cycle can be interrupted at customer defined times or events, through a verification or calibration: see sections below.



Select tab sheet Sequence Table with a click on it:

	Sequence Propert		Verification P Verification T			ion Properties ion Table
#	Sample Type	Replicates	Calib.Level	Stream #	Flush time (s)	
1	1. Analysis	1	1	1	150	
2	1. Analysis	2	1	2	150	
3	1. Analysis	1	1	3	150	
4						

In the above Sequence Table, the following sequence of sample streams is programmed:

- 1. 1 run of STR1
- 2. 2 runs of STR2
- 3. 1 run of STR3

Once started, the analyser will run continuously through this cycle, only interrupted by verifications or calibration (see further).

In principle a calibration or verification could also be programmed in **Sequence Table**. See shown options in the next figure:

Sample Type Replicates Calib.Level Stream # Flush time (s) 1. Analysis 1 1 150 1. Analysis 2 1 2 150		Sequence Properties Sequence Table	<u>I</u>	Verification Pr	·	∕╹─────	on Properties on Table
1. Analysis 1 1 1 150 1. Analysis 2 1 2 150 1. Analysis 1 1 3 150 0. None		Sequence Table	<u> </u>	* childdion 11		Calibrat	
1. Analysis 2 1 2 150 1. Analysis 1 1 3 150 0. None	;	Sample Type	Replicates	Calib.Level	Stream #	Flush time (s)	
1. Analysis 1 1 3 150 0. None <th<< td=""><td></td><td>1. Analysis</td><td>1</td><td>1</td><td>1</td><td>150</td><td></td></th<<>		1. Analysis	1	1	1	150	
0. None		1. Analysis	2	1	2	150	
	1	1. Analysis	1	1	3	150	
0. None		0. None 💌	Í				
1. Analysis							

Analysis (Analysis), Blank (purge) Calibration (calibrate) Verification (verify)



.

Conducting verifications and calibrations is typically triggered based on a specific time or a specific event. But since this table is designed for continuous use, it is better to use the appropriate tabs for the verification and calibration.

Other parameters in Sequence Table:

- Replicates: number of runs to be done consecutively, normally 1
 - Calib. Level: The calibration level for the EnCal 3000 is default set to 1.
 - When using a multi-level calibration of the level 8 for daily calibration is used.
- Stream #: number of the physical connection port of the stream
- Flush time: should be less than 180 s.

The **Flush Time** will only be taken into account at the first run. During the next streams it will be hidden in the so-called **Stream Ahead Flushing**, which is standard programmed for the EnCal 3000. Flush time only serves as a safety back-up for the first run, but is not used once the analyser is running its continuous cycle of analyses.

Initial F	lush	Stream Ah	ead Flushing	Stream Ahe	ad Flushing	Stream Ah	ead Flushing	Stream Ahe	ead Flushing	
	Inje	ction	Injecti	on	Inject	ion	Injecti	on	Injecti	on
							-			
Last stream	:/	Last stream	:/	Last stream	:1	Last stream	:2	Last stream	:2	
Current Stream	:/	Current Stream	:1	Current Stream	:2	Current Stream	: 2	Current Stream	: 3	
Next Stream	:1	Next Stream	: 2	Next Stream	: 2	Next Stream	: 3	Next Stream	:1	



Sequence Properties allows defining the following parameters:

Sequence Table Verification Table Calibration Table Sequence Properties Verification Properties Calibration Properties Main Sequence Image: Calibration Properties Calibration Properties Image: Calibration Properties Image: Calibration Properties Calibration Properties
Main Sequence ✓ Auto start sequence on power-up ⓒ Run sequence continuously ⓒ Times to repeat sequence Number of repeatings: 1
Main Sequence ✓ Auto start sequence on power-up ⑥ Run sequence continuously ⑦ Times to repeat sequence Number of repeatings: 1 Run cycle time [sec]: 0 ✓ Ignore Cycle time for Verification and Calibration runs
Stream Selector Home Position (on error and 7 V Stream Ahead Scheduling when sequence stops):

•	Auto otalit ooquonoo on ponor up:	, atomato start er tre bequeries for ethioring.
•	Run sequence continuously:	Selected by default t.
•	Times to repeat sequence: Number of repeating's:	Not used in normal operation (only for test purposes)
•	Run cycle time:	Ration of a cyclic passage
•	Ingore Cycle time for Verification and Calibrarion run:	Ignore duration of verification and calibration pass.
•	Home Position:	This is either 0 (if all stream select valves need to be closed in case of errors or when the sequence stops), or one of the physically connected streams
•	Stream Ahead Scheduling:	Selected by default, if this option is activated the next stream to analyse would be flushed during the actual analysis. If not selected an extra flushing time is needed before the next Analysis on the other stream would be started.



4.3 Calibration

Most users will only have to change the calibration gas composition according to the actual calibration gas, and adjusting the calibration time according to contractual specifications. For the other parameters, it will not be needed to change the factory settings.

Make sure that the calibration gas composition corresponds to the process gas and the quality of the components is 2.0 (max. 1% relative uncertainty) or better. This is a requirement to ensure adequate accuracy of the device to achieve.

The definition of the calibration involves 5 menus:

- Calibration Settings: various calibration characteristics
- Peak Identification Table: calibration gas composition
- Calibration Table: timing of the calibration
- Calibration Properties: Start and completion time
- Site Info: calorific value and density of calibration gas

In the **Calibration Settings** dialog box under the menu item **Peak Calibration** (menu **Method**), the calibration settings for the selected channel will be displayed. Also the type of calibration can be set.

🔀 Review Peak Calibration: Cha	annel 1	
Calibration Settings		
Response Mode: Area Calibration Mode: External Stand R.F. Type: Manual and C Retention Update% 50 RF Unknown peaks: C Abs.		1 V V 1. Calibration V
Methane CO2 Ethane 3	Change 4,5 4,5 4,5 4,5 4,5 4,5 4,5 4,5 4,5 4,5	
Sample Level 1 Area (Amount) 1 49513,811069 (3,996900)) <u>)</u>	



Following parameters are defined:

Response Mode:	Area by default.
RF Type:	Manual and Curve by default.
Retention Update:	Defines the actual shift of retention time. Typically 50 % are sufficient for a correction of non-typical changes of the retention times.
RF Unknown Peaks:	Response factors of unknown variables can be set in two ways: Relative (Rel.) is used in a formula the response factor of the nearest known component. Absolute (Abs.) used in a formula or entered value from the literature. 0 is the default.
Calibration Check:	is enabled by default, so it is checked how much the response factors for the individual components in comparison to the last calibration and the basic cal- ibration has changed.
Initial Calibration:	Only activated during an initial calibration (FAT, SAT, or when a new calibra- tion gas is connected. When enabled, all deleted before calculated response factors and by a basic calibration recalculated
Use GOST Calibration:	This option allows you to calibrate the device after the GOST standard. By activating this field Calibration Check and / or Initial Calibration can be switched off and set further parameters on other sites already automatically.
Retention Window update:	Calibration is preset. An update of the Retention window for each analysis may be performed theoretically, but in practice this is not needed, and would impact the processor with an unnecessary amount of computations.
Download Calibration Curve with method:	Not activated by default. This option has to be used to download an entered response function. An example for the use of this option is entering an external calculated response function from a multilevel calibration.

In the **Calibration Settings** dialog box additional the **Calibration Results** are shown. To change the channel for viewing, click on the channel selection in the header. All existing channels can be chosen.

🔣 RGC 3000 - #60600227-E	nCal 3000: Ready
File View Method Application	n Automation Control Report Window Help
🗅 🚅 🗐 🎒 💈 2: CP-4900) Column Mod 💌 📑 📲 🥶 🎤 💷 🕋 🖉 🖃 🗔 😤 🝸
Instrument Status	
Instrument	Enhanced



The calibration gas composition needs to be entered in the **Peak Identification** table (under menu Method) for the all channels.

For standard applications the Level1 column is provided. When using a multi-level calibration for daily calibration Level 8 column is to use.

										\frown							\frown
N Pe	ak Ide	ntification / Cali	bration: Cha	nnel 1													
#	Active	Peak Name	ID	Ret. Time	Rel.Ret.Window	Abs.Ret.Window	Reference	Selection Mode	Rel.Ret.Peak	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8 Rw
1	M	Nitrogen	1	5,97086	5	5		0. Nearest		3,9969	0	0	1	1	-)	0	3,9969
2		Methane	2	7,713597	5	5		0. Nearest		88,8937	0	0		or.		0	88,8937
3	\checkmark	CO2	3	20,02209	5	5		0. Nearest		1,5026	0	0				0	1,5026
4	\sim	Ethane	4	32,9556	5	5		0. Nearest		4,003	0	0		~	~	0	4,003
_	-																

Therefore again, as described above, choose the corresponding channel in the header of the RGC 3000-software, the menu item **Peak Identification** remains open.

If the calibration according to the GOST standard used in this table also the values from those used in the standard tables "Table 2" and "Appendix A, Table 1," for each channel must be entered (see picture).

			5			
Linear coeff.	Q	۰ <u>،</u>	GOST-R7 T2:A%	GOST-R7 T2:B%	GOST-R7 A.T1:A%	GOST-R7 A.T1:B%
3.2839451420345E-05	0		0.03	0.0004	0.015	0.0002
3.11500028067349E-05	0	_	0.02	0.0002	0.01	0.0001
3.75380677369366E-05	0		-0.0056	0.62	-0.0028	0.31
2.49534244730259E-05	0		0.02	0.0003	0.01	0.00015
		_				

In the **Peak Identification** table also limits on the response factors for the individual components in comparison to the last calibration and the basic calibration are set. Should be the change over a certain threshold, in the figure below 5%, the newly determined response factors are discarded.

#	Curve Type	Thru origin	RF other peak	Intercept coeff.	Linear coeff.	Quadratic coeff.	Manual RF	Manual RF	InitialRF%	CurrentRF%
1	0. Linear	\checkmark	0	0	16172,3802703385	0		1	5	5
2	0. Linear	_	0	0	13635,3069538877	0		1	5	5
3	0. Linear	_	0	0	19479,2024882378	0		1	5	5
4	0. Linear	_	0	0	20920,0603969714	0		1	5	



The **Automation / Sequence** menu allow the tabs for the calibration to determine the nature and timing of calibration.

In tab. sheet **Calibration Table** the number and the nature of the passes, which are used for the calibration, indicated.

Þ	Sequ	ience					
Í		Sequence Properties Verification Properties		tion Properties	Calibration Properties		
Ĺ	Sequence Table		Verification Table		Calibrati	Calibration Table	
	#	Replicates	Calib.Level	l Calib.Type	Stream #	Flush time (s)	
	1	1	1	0. Ignore	6	150	
	2	2	1	2. Append	6	0	

In the above example, a calibration consists of:

- 1. One Ignore run, i.e. the system is flushed with calibration gas, but the analysis data are not taken into account for the calculation of the response factors
- 2. Two Append runs, i.e. the average response factors are calculated after all calibration runs are executed

For "**Calib. Type**", also "**Replace**" could be selected. This means a new calculation of the response factors after every new calibration run.

Note also that in the above example the calibration gas is physically connected to port 6, which might be different for other applications.

If the calibration after the GOST standard chosen, the tab **Calibration Table** automatically changes to the values shown below.

Sequence Properties		Verification Properties		Calibration Properties	
#	Replicates	Calib.Level	Calib.Type	Stream #	Flush time (s)
1	1	1	1. Replace	6	120
2	1	1	2. Append	6	0
3	1	1	2. Append	6	0
4	1	1	3. GOST optional	6	0
5	1	1	3. GOST optional	6	0

Please remember that a calibration by deselecting the GOST standard or a switch between GOST standard and the other calibration methods require a further adjustment of the table.

EnCal 3000 – Software Manual



Calibration Properties allows defining the following parameters:

🔀 Sequence		
Sequence Table	Verification Table	Calibration Table
Sequence Properties	Verification Properties	Calibration Properties
Activate Calibration Table on the folk On Sequence Startup When sequence is running On Runs Performed (runs): On Time Elapsed (hours): On Fixed Time: Hour: None On Verification Failure	2	very n days: 1

- Automatic start when starting the sequence (Auto start on sequence start-up)
- start at specific events (Start-up on events)
- (Number of times or the number of elapsed hours)
- calibration at a specified time (Calibration on fixed time): this is the default selection
- calibration with an error in the verification (Calibration on verification failure)

In the above example, the gas chromatograph is calibrated each day at 8:30 clock in the morning.

If the calibration is chosen according to the GOST standard can only be changed the day and time. The other parameters are locked.

🥦 Sequence	×
Sequence Table Verification Table Calibration Table	
Sequence Properties Verification Properties Calibration Properties	
Le contra de la co	
Activate Calibration Table on the following events:	
🔲 On Sequence Startup	
When sequence is running	
C On Runs Performed [runs]: 0	
C On Time Elapsed [hours]:	
On Fixed Time: Hour: O Minute: O Once Every n days:	
C None	
🗖 On Verification Failure	-



The calorific value and density are under the Automation menu submenu Site Info.

It looks like this:

🛃 Site Info		1
Site Name (see host name):	GQ	
Customer ID:		
Tag Number ID:		
Calibration Gas 1 Cylinder ID:		
Calibration Gas 2 Cylinder ID:		
Contract Time: Hour:	0 Minute: 0	
Density type API21 logging:	Relative Density	
Calorific Value:	11,1246	
Density:	0,80836	
Sample Streams Identity:		
# Stream Identity	▲	
1		
2		
3	_	

In the example above, the values of the calorific value and the density of the calibration are shown.

This data is transmitted to the controller EnCal 3000 for display and are under the Calibration menu appears (see manual of the controller EnCal 3000).

If these values are not specified, the target values for calorific value and density on the EnCal 3000 controller are not displayed correctly.



4.4 Setting the retention times (Peaks)

The retention times need to be adjusted in case the temperature or pressure settings of the channels are modified. All channels work completely independent, so if only one channel is touched, only the retention times of this channel have to be modified.

Adjustment occurs in menu Method / Peak Identification:



Ĭ ✓	Nitrogen	1	7.132815						
V			7.132013	5	5	0. Nearest	11.0037	0	0
	Methane	2	9.397362	5	5	0. Nearest	86.011	0	0
M	CO2	3	23.26828	5	5	0. Nearest	1.552	0	0
M	Ethane	4	38.13656	5	5	0. Nearest	0.75	0	0

The other channels can be selected in the header of the RGC 3000 software, if necessary:

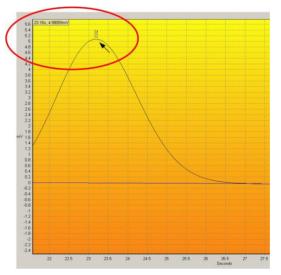
🕂 RGC 3000 - #60500202-EnCal 3000: Connecting										
File View	Method Application Automation Control Report Window Help									
0 🛩 🖬	🞒 1: CP-4900 Column Mod 🔽 🗾 🗐 🗐 🖉 🔎 🕋 🜌 🖃 🔲 🖶 🛐									
	1: CP-4900 Column Mod									
	2: CP-4900 Column Mod									

Once the analysis is stable, please record the retention time for each peak by using the mouse to click and read the signal peak in the upper left corner of the corresponding retention time (see figure).

Fill in the results under menu Peak Identification.

Save the method on the hard disk and export them to the gas chromatograph.

📲 Download to EnCal 3000	6 🛛
	ОК
✓ Method ✓ Application	Cancel
Sequence	
🔲 Site Information	→ `
Modbus Settings	- 48 <u>6</u>





4.5 Verification

Verification is typically used to evaluate the performance of the analyser by analysing the calibration gas and comparing the results with the certificate data.

In principle this could also be performed on any test gas with known composition, but the use of the calibration gas is of course the most practical option.

The measurement parameters are set via the menu item Verification Check in the menu Application.

🔡 R	IGC 3	000 - #	60700235	EnCal 300	0: Read	у			
File	View	Method	Application	Automation	Control	Report	Window	Help	
	2 E		Normalize Calorific F		•	7	2	8	
			Verificatio	on Check					
			Alarms						
			Timed Re	•					
			Analog In	•					
			Digital Inp	outs					

Verification Table allows entering minimum and maximum values for the measured properties:

		Verification Settings	Verificatio	on Table		
#	Active	Param Type	Parameter	Minimum	Maximum	
1		2. Normalized Amounts 📃 💌	1. Nitrogen (Chan 1)	10.8	11.2	
2	M	2. Normalized Amounts	2. Methane (Chan 1)	85.8	86.2	
3		2. Normalized Amounts	3. CO2 (Chan 1)	1.5	1.6	
4		2. Normalized Amounts	4. Ethane (Chan 1)	0.7	0.8	
5	M	2. Normalized Amounts	5. Propane (Chan 2)	0.25	0.35	
6	M	2. Normalized Amounts	6. i-Butane (Chan 2)	0.9	0.11	
7		2. Normalized Amounts	7. n-Butane (Chan 2)	0.9	0.11	
8	M	2. Normalized Amounts	8. neo-Pentane (Chan 2)	0.045	0.055	
9		2. Normalized Amounts	9. i-Pentane (Chan 2)	0.045	0.055	
10	M	2. Normalized Amounts	10. n-Pentane (Chan 2)	0.045	0.055	
11		2. Normalized Amounts	11. n-Hexane (Chan 2)	0.045	0.055	
12		2. Normalized Amounts	12. n-Heptane (Chan 2)	0.015	0.025	
13		2. Normalized Amounts	13. n-Octane (Chan 2)	0.005	0.015	
14	M	6. ISO 6976 Results	5. Hs	35.65	35.67	
15	M	6. ISO 6976 Results	8. Rel. Density	0.6285	0.6295	

Don't forget to activate the verification table in Verification Settings!

Y		
Verification Settings	Verification Table	
ification parameters		
Verification table enabled		



Verification Properties allows to program verification as an event, for example every 10000 analyses.

🔀 Sequence		
Sequence Table	Verification Table	Calibration Table
Sequence Properties	Verification Properties	Calibration Properties
Activate Verification Table on the follow On Sequence Startup When sequence is running On Runs Performed (runs):	1000	very n days: 1

Verification Table allows defining the number of runs for the verification, and which physical stream to be selected (normally the calibration input).

>	Seque	ence									
ſ	Sequence Properties Verification Properties Calibration Properties										
Ĺ		Sequence Table	•)	Verification	n Table	Calibration Table					
	#	Replicates	Calib.Level	Stream #	Flush time (s)						
	1	1	1	6	150						
	2										
		•									



4.6 Setting the limits for alarms (Alarms)

Settings for alarm messages are done in the **Application / Alarms** menu:



The Alarm Table allows entering minimum and maximum values for the measured properties:

		Alarm Settings	· · · · · · · · · · · · · · · · · · ·	Alarm Table						
#	Active	Param Type	Parameter	Minimum	Maximum	Alarm On	Invert Alarm	Relay Alarm	Relay #	Invert Rela
1	\checkmark	2. Normalized Amounts	1. Nitrogen (chan 1)	0	22	5. All			0. None	
2	\checkmark	2. Normalized Amounts	2. Methane (chan 1)	55	100	5. All			0. None	
3	\checkmark	2. Normalized Amounts	3. CO2 (chan 1)	0	12	5. All			0. None	
4	\checkmark	2. Normalized Amounts	4. Ethane (chan 1)	0	14	5. All			0. None	
5	\checkmark	2. Normalized Amounts	5. Propane (chan 2)	0	5	5. All			0. None	
6	\checkmark	2. Normalized Amounts	6. i-Butane (chan 2)	0	1,5	5. All			0. None	
7	\checkmark	2. Normalized Amounts	7. n-Butane (chan 2)	0	1,5	5. All			0. None	
8	\checkmark	2. Normalized Amounts	8. neo-Pentane (chan 2)	0	0,1	5. All			0. None	
9	\checkmark	2. Normalized Amounts	9. i-Pentane (chan 2)	0	0,3	5. All			0. None	
10	\checkmark	2. Normalized Amounts	10. n-Pentane (chan 2)	0	0,3	5. All			0. None	
11	\checkmark	2. Normalized Amounts	11. n-Hexane (chan 2)	0	0,3	5. All			0. None	
12	\checkmark	6. ISO 6976 Results	5. Hs	7,3	14,9	5. All			0. None	
13	\checkmark	6. ISO 6976 Results	7. Abs. Density	0,72	1,2	5. All			0. None	
14	\checkmark	3. Sample results	1. Sum ESTD	97	103	5. All			0. None	
15	\checkmark	8. GC Status	1. Instrument Error	2	3	5. All			0. None	
16	\checkmark	2. Normalized Amounts	12. n-Heptane (chan 2)	0	0,3	5. All			0. None	
17	\checkmark	2. Normalized Amounts	13. n-Octane (chan 2)	0	0,3	5. All			0. None	
18	\checkmark	2. Normalized Amounts	14. n-Nonane (chan 2)	0	0,3	5. All			0. None	
19	\checkmark	2. Normalized Amounts	16. Benzene (chan 2)	0	0,3	5. All			0. None	
20	\checkmark	2. Normalized Amounts	17. Cyclohexane (chan 2)	0	0,3	5. All			0. None	
21	\checkmark	2. Normalized Amounts	18. Methylcyclohexane (chan 2)	0	0,3	5. All			0. None	
22	M	2. Normalized Amounts	19. Toluene (chan 2)	0	0,3	5. All			0. None	

In principle each alarm can be defined for only one sample type (i.e. analysis, calibration, verification or blank) in "Alarm On", but in practice this value will be put on "All". The table also allows assigning the alarm to a relay (max. 3).



Don't forget to activate the alarms in Alarm Settings!

EnCal 3000 – Software Manual



4.7 Configuration of ModBus Table (Modbus Setup)

In Automation / Modbus Setup menu Modbus parameters of EnCal 3000 can be configured:

🚹 RGC 3000 - #60700235	EnCal 3000: I	Ready	/		
File View Method Application	Automation Co	ntrol	Report	Window	Help
🗅 🚅 🔚 🎒 1: CP-4900 C	Sequence			2	🏭 🖉 🖻 🖻 📑 👔
	Site Information				
	Modbus Setup		l		
	FTP Service				
	Real Time Clo	:k			
	Reprocess Lis	:			

Process Settings defines the protocol settings. By default the EnCal 3000 is set-up for the Instromet RTU Modbus protocol, at a baud rate of 9600.

🜉 Modbus Setup	
Process Settings	Registers Setup
Protocol	
C MODICON C INSTROMET	7 DANIEL 7 ENRON 7 OMNI
Synchronization with Modbus Master	
Reset-Time New Data Available flag [s]:	60
Communication Settings	
Common settings:	Serial communincation settings:
Slave Address: 1	Port settings: 9600:N,8,1
Floating Point Type Conversion	Comport Primary: 2
Normal C Reverse	Comport Secondary: 0
INT32 bit Type Conversion	Serial Transmission Mode
Normal O Reverse	C RTU © ASCII
Shift Modbus Addresses	
● No C 1up C 1 down	



If needed, the baud rate could be changed in the configuration menu of the unit.

RGC 3	000 - #	60700235	EnCal 300	0: Read	у			
			Automation					
2	6	1: CP-4900 C	olumn Mod 🕒	- 🔡	3	2	🛍 🜌	3

Quit RGC3000, and return to the start-up menu.

Select first the connected unit, then Configure under Control

a 🗐 🗖 🗖 🖉
Control
EnCal 3000
Street and
Correct
Configured Instruments
Connection elster
10.49.124.232 Instromet
© Agilent Technologies, 2012
Elster Instromet
form instrument operations.

And again **Configure** in the next window.

Configure Instruction	rument	8 🛛
Instrument Type:	EnCal 3000	Configure
Serial Number:	60700235	R.
Title:	EnCal 3000	
OK	Cancel	

EnCal 3000 – Software Manual



Select tab sheet Automation in the configuration screen.

🦀 EnCal 3000 Configuration (Admin) 🖉 🔳 🗖 🔀
Ethernet Communication Setup
IP Address: 10 16 1 91 Setup IP address
IP Address: 10 16 1 91 Setup IP address Reboot EnCal 3000
Configuration settings
Hardware User PROstation Automation Info
I/O: To be used Available Stream Selector Alarm Relays: 3 8 Streamer Type: Relays (solenoids) Download Timed Relays: 3 3 3 Image: Stream Selection requests from a host system Download Analog Outputs: 0 0 0 Image: Stream Selection requests from a host system Image: Stream Selection requests from a host system
Analog Inputs: 2 6 Serial Ports: Modbus Serial Comm. Comport VICI: Not used Baudrate: 9600 LCD Display: Not connected Databits: 8
Extension board detection: LCD Display: Not connected Databits: 8 Image: Comport 1 Databits: 8 Image: Comport 1 Databits: 8 Image: Comport 1 Databits: 1 Image: Comport 1
Show I/O Configuration miscellaneous: Image: Postpone run till external 'Ready In'
Instrument serial number: 61100591
<u>O</u> K <u>Cancel</u>

In the right lower corner the baud rate can be changed. Don't forget to download the new setting to the unit (after which the unit will ask you to restart, which can be done with the button in the upper right corner).

Never change the COM port settings; these define the internal COM port configuration of the EnCal 3000.



Register Setup allows configuring the ModBus registers are user configurable:

#	Active	Register Type	Register #	Data Type	Parameter ID.	CH	nannel	Peak#
15		2. Holding Register (RW)	7009	3. Float	2401. Appl.: Stream Component Norm%(Double, CHAN=stream, PEAK)	1.	Stream 1	9
		2. Holding Register (RV		3. Float 💌	2401. Appl.: Stream Component Norm%(Double, CHAN=stream, PEAK)	•	1. Stream 1	-
		0. Coil Status (RW) 1. Input Status (R) 2. Holding Register (RW) 3. Input Register (R)		0. Bit 1. Int16 2. Int32 3. Floet	2401. Appl.: Stream Component Norm%(Double, CHAN=stream, PEAK) 2402. Appl.: Stream Alarm on Index(Int32, CHAN=stream, PEAK=index) 2403. Appl.: Stream Overall Alarm Status (Int32, CHAN=stream) 2404. Appl.: Stream Compressibility (Double, CHAN=stream) 2405. Appl.: Stream Wobbe Superior (Double, CHAN=stream) 2406. Appl.: Stream ISO Hs (Double, CHAN=stream) 2407. Appl.: Stream ISO Hs (Double, CHAN=stream) 2408. Appl.: Stream ISO Abs.Density (Double, CHAN=stream)		0. None 1. Stream 1 2. Stream 2 3. Stream 3 4. Stream 4 5. Stream 5 6. Stream 6	

- Register Type: Either Read Only (R) or Read/Write (R/W), and either bit (Status) or register size.
- Register #: User selectable. For the Instromet protocol be aware of the following restrictions:
 0 4999 : 2 bytes per Registers
 - 5000 6999: 4 bytes Integers
 - 7000 Higher: 4 bytes Floating Point
 - the Modicon protocol always uses 4 registers.
- Data Type: Bit when Status is defined, Integer (16 bit or 32 bit) or Float when Register is defined.
- Parameter ID: Instruction set which is available in EnCal 3000. See next pages for complete list.
- **Channel**: This column is reserved to define channel # or stream #, depending on the type of Parameter ID defined.
- **Peak #**: Component number, if applicable.
- Note: If components are added, changes must be made in the Modbus list to, submit the results of all components to a controller or flow computer. For the controller type gasnet EnCal 3000 a standard ModBus list is used, which contains up to 26 readable components.



4.8 Generation of reports (Report)

Reports can be created in the **Report** menu on the screen and print it out. The amount depends on the application and the number of components increases accordingly.

RGC 3000 - #60500202-EnCal 3000: Initializing	
File View Method Application Automation Control	Report Window Help
D 🖻 🖬 🎒 1: CP-4900 Column Mod 💌 📱 🗐	Integration Report Application Report Stream Application Report
	Diagnostics Print Integration Report Print Application Report
	Auto Print Application Report on Calibration Auto Print Application Report on Alarm

Integration Report gives details on the component analysis. It is only used for tests and diagnostics.

🖓 li																	_ _ ∠ ×
#	Channel	Peak #	Peakname	ESTD Conc.	Retention [s]	PeakRRT [s]	Area	Height	Width[s]	Separ.Code	Validation	Pk Start [s]	Pk End [s]	Assymetry 5%	Used RF	InitRF Alarm	CurrRF Alarm
1	1	1	Nitrogen	3,996900	5,97	0,0000	49513,8111	5463670,7454	0,5101	BV	0	4,90	6,93	1,0732	8,07229E-5		
2	1	2	Methane	88,893700	7,71	0,0000	925697,8401	57944446,1729	0.8912	VB	0	6,93	11,06	2,5198	9,60289E-5		
3	1	3	CO2	1,502600	20,03	0,0000	22143,2796	664857,6117	1,8760	BB	0	16,70	23,85	1,0567	6,78581E-5		
4	1	4	Ethane	4,003000	32,97	0,0000	63530,6756	1214006,2800	2,9413	BB	0	28,23	39,00	1,0976	6,30089E-5		
5	2	5	Propane	1,001600	12,38	0,0000	55851,5291	6701271,7125	0,4881	BB	0	11,79	13,14	1,0800	1,79333E-5		
6	2	6	i-Butane	0,200800	14,62	0,0000	13161,2786	1395326,3027	0,5396	BB	0	13,86	15,48	0,9992	1,52569E-5		
7	2	7	n-Butane	0,201000	16,36	0,0000	13933,4059	1384374,0881	0,5637	BV	0	15,51	16,96	1,0543	1,44258E-5		
8	2	8	neo-Pentane	0,050000	17.25	0,0000	3166,9130	304598,5274	0.6314	VB	0	16,96	18,35	1,6758	1,57882E-5		
9	2	9	i-Pentane	0,049900	22,29	0,0000	3752,4623	278968,5323	0,7595	BB	0	21,09	23,76	1,0091	1,32979E-5		
10	2	10	n-Pentane	0,050100	25,15	0,0000	3844,3802	282499,6063	0,7685	BB	0	23,76	26,46	1,0159	1,30320E-5		
11	2	11	n-Hexane	0,050400	44,71	0,0000	4411,3769	208259,2481	1,1940	BB	0	42,39	47,25	1,0120	1,14250E-5		
12	2	12	?	0,000239	54,64	0,0000	20,9421	773,6555	1,6910	BB	0	52,00	56,06	1,2355	1,14250E-5		
13	2	13	?	0,000191	80,45	0,0000	16,7472	267,1238	5,3552	BB	0	78,97	85,21	2,5750	1,14250E-5		
14	2	14	?	0,000118	146,20	0,0000	10,3256	263,3397	1,7033	BB	0	143,66	147,38	0,9630	1,14250E-5		

Screen Display Integration Report

RGC 3000 Integration report

Integration Report file: c:\RGC 3000\60700235\Data\UplTemp.pdat UserName: admin Print date: 02.Okt.2012 15:23

#	Ch	annel Peak #	Peakname	ESTD Conc.	Retention [s]	PeakRRT[s]	Area [x10nV·S]	Height [x10nV]	Width[s]	Sep.Code	Validation	Pk Start[s]	Pk End[s]	Asym 5%	Used RF
1	1	1	Nitrogen	3,996900	5,97	0,0000	49513,8111	5463670,7454	0,5101	BV	0	4,90	6,93	1,0732	8,07229E-5
2	1	2	Methane	88.893700	7.71	0.0000	925697.8401	57944446.1729	0.8912	VB	0	6.93	11.06	2,5198	9.60289E-5
3	1	3	CO2	1,502600	20,03	0,0000	22143,2796	664857,6117	1,8760	BB	0	16,70	23,85	1,0567	6,78581E-5
4	1	4	Ethane	4,003000	32,97	0,0000	63530,6756	1214006,2800	2,9413	BB	0	28,23	39,00	1,0976	6,30089E-5
5	2	5	Propane	1,001600	12,38	0,0000	55851,5291	6701271,7125	0,4881	BB	0	11,79	13,14	1,0800	1,79333E-5
6	2	6	i-Butane	0,200800	14,62	0,0000	13161,2786	1395326,3027	0,5396	BB	0	13,86	15,48	0,9992	1,52569E-5
7	2	7	n-Butane	0,201000	16,36	0,0000	13933,4059	1384374,0881	0,5637	BV	0	15,51	16,96	1,0543	1,44258E-5
8	2	8	neo-Pentane	0,050000	17,25	0,0000	3166,9130	304598,5274	0,6314	VB	0	16,96	18,35	1,6758	1,57882E-5
9	2	9	i-Pentane	0,049900	22,29	0,0000	3752,4623	278968,5323	0,7595	BB	0	21,09	23,76	1,0091	1,32979E-5
10	2	10	n-Pentane	0,050100	25,15	0,0000	3844,3802	282499,6063	0,7685	BB	0	23,76	26,46	1,0159	1,30320E-5
11	2	11	n-Hexane	0,050400	44,71	0,0000	4411,3769	208259,2481	1,1940	BB	0	42,39	47,25	1,0120	1,14250E-5
12	2	12	?	0,000239	54,64	0,0000	20,9421	773,6555	1,6910	BB	0	52,00	56,06	1,2355	1,14250E-5
13	2	13	?	0,000191	80,45	0,0000	16,7472	267,1238	5,3552	BB	0	78,97	85,21	2,5750	1,14250E-5
14	2	14	?	0,000118	146,20	0,0000	10,3256	263,3397	1,7033	BB	0	143,66	147,38	0,9630	1,14250E-5

Print out of Integration report



Application Report gives the complete analysis, with calculated data and stream information, and is the report normally used by the operator.

A M	oplicatio	on Report									
SAM	PLE		ENERG	r		ENVIRO	IMENT		⊢ Hid	e non Appl.pks	
Samp	ling Time	20/09/2012 17:29:58	Calc.Meth	nod	ISO 6976	Sampling A	nalog #1 0,00	00	⊢ Hid	e Ignored Appl.pks	
Runt	lumber	26	Compress	ibility	1,00000	Sampling A	nalog #2 0,00	00			
Run 1	јуре	Analysis	Molar Ma	88	18,07313	Cabinet Te	mperature 37				
Calibr	ation Leve	I 0	Molar Ma	ss Ratio	0,62402	Ambient Pr	essure 100				
Strea	m #	1	Rel.Dens	ty	0,62365	Digital in #	1 0				
Suml	ESTD	100,0005	Abs.Dens	ity	0,80633	Digital in #	2 0				
Suml	Estimates	0,0000	Hs		11,14188	Digital in #	3 0				
Sum /	Areas	1159054,9674	Hi		10,06183						
Total	Peaks	26	Wobbe S	up.	14,10876	SITE INF	0				
ls Sta	rtup Run	False	Wobbe Ir	ıf.	12,74110	Customer I	D				
Unkn	own Peak:	s 3				Instrument	Name EnCa	al 3000			
Curre	nt Stream ‡	# 7				Serial Num	ber 6070	0235			
						Tag Numb	er				
						Cylinder 1	Гад				
#	Channel	Peakname	ESTD Conc.	Norm. Conc.	Potentian (-)	4.00	Height	Meth-Index	Group#	R.F.	Т
# 1	Lhannel 1	Peakname Nitrogen	3,996900	3,996878	Retention [s] 5,97	Area 49513,8111	Height 5463670,7454	Meth-Index	Group#	8,072293E-05	-
2	1	Methane		88,893212	7,71		57944446,1729	2	0	9,602885E-05	-
2	1	CD2	88,893700	1.502592	20.03	925697,8401	664857,6117	2	0	9,602880E-05	_
	1				32.97	22143,2796	-	3	0		_
4		Ethane	4,003000	4,002978		63530,6756	1214006,2800	· · · · · · · · · · · · · · · · · · ·	-	6,300893E-05	_
5	2	Propane	1,001600	1,001595	12,38	55851,5291	6701271,7125	5	0	1,793326E-05	_
6	2	i-Butane	0,200800	0,200799	14,62	13161,2786	1395326,3027	6	0	1,525688E-05	_
7	2	n-Butane	0,201000	0,200999	16,36	13933,4059	1384374,0881	7	0	1,442576E-05	
8	2	neo-Pentane	0,050000	0,050000	17,25	3166,9130	304598,5274	8	0	1,578825E-05	
9	2	i-Pentane	0,049900	0,049900	22,29	3752,4623	278968,5323	9	0	1,329793E-05	
10	2	n-Pentane	0,050100	0,050100	25,15	3844,3802	282499,6063	10	0	1,303201E-05	
11	2	n-Hexane	0,050949	0,050948	44,71	4411,3769	208259,2481	11	0	1,1425E-05	
12	2	n-Heptane	0,000000	0,000000	0,00	0,0000	0,0000	12	0	0	
13	2	n-Octane	0,000000	0,000000	0,00	0,0000	0,0000	13	0	0	
14	2	n-Nonane	0,000000	0,000000	0,00	0,0000	0,0000	14	0	0	
15	2	n-Decane	0,000000	0,000000	0,00	0,0000	0,0000	15	0	0	
16	2	Benzene	0,000000	0,000000	0,00	0,0000	0,0000	16	0	0	
17	2	Cyclohexane	0,000000	0,000000	0,00	0,0000	0,0000	17	0	0	
18	2	Methylcyclohexane	0,000000	0,000000	0,00	0,0000	0,0000	18	0	0	
19	2	Toluene	0,000000	0,000000	0,00	0,0000	0,0000	19	0	0	
20	2	n-Undecane	0,000000	0,000000	0,00	0,0000	0,0000	20	0	0	
21	2	n-Dodecane	0,000000	0,000000	0,00	0,0000	0,0000	21	0	0	
22	2	H2S	0,000000	0,000000	0,00	0,0000	0,0000	22	0	0	
	2	COS	0,000000	0,000000	0,00	0,0000	0,0000	23	0	0	
23		Oxygen	0,000000	0,000000	0,00	0,0000	0,0000	24	0	0	
23 24	2	onygon	0,000000								
	2 2	Hydrogen	0,000000	0,000000	0,00	0,0000	0,0000	25	0	0	

Screen Display Application Report





RGC 3000 Application report

Application report file: c:\RGC 3000\60700235\Data\UplTemp.pdat UserName: admin Print date: 02.Okt.2012 15:21

Run 1 Run 1 Calib Strea Sum Sum Sum Total Is Sta Unkn	oling Time Number	r 1 100,0005 0,0000 1159054,96 26 False s 3			ENERGY Calc.Method Compressibili Molar Mass Molar Mass R Rel.Density Abs.Density Hs HI Wobbe Sup. Wobbe Sup.	ty 1,00 18,0 (atio 0,62 0,80 11,1 10,0 14,1	6976 0000 17313 1402 1365 1633 14188 16183 0876 14110		ENVIRONMENT Sampling Analog #1 Sampling Analog #2 Cabinet Temperature Cabinet Pressure Digital in #1 Digital in #2 Digital in #3 SITE INFO Customer ID Instrument Name Serial Number Tag Number Cylinder 1 Tag	0,0000 0,0000 37 100 0 0 0 EnCal 3000 60700235
# 1 2 3 4 5 6 7 8 9 10 112 3 4 5 6 7 8 9 10 112 3 4 5 6 7 8 9 10 112 3 4 5 6 7 8 9 10 112 3 4 5 6 7 8 9 10 112 3 4 5 6 7 8 9 10 112 3 4 5 6 7 8 9 10 112 3 4 5 6 7 8 9 10 112 3 112 112 112 112 112 112 112 112 1	Channe 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	I Peakname Nitrogen Methane CO2 Ethane Propane i-Butane n-Butane n-Pentane n-Pentane n-Pentane n-Hexane n-Hexane n-Hexane n-Hexane n-Decane Benzene Cyclohexane Methylcyclohexane Toluene n-Dodecane h2S COS Oxygen Hydrogen Helium	ESTD Conc. 3,996900 88,893700 1,502600 4,003000 0,200800 0,200800 0,050100 0,050100 0,050100 0,050100 0,050100 0,000000 0,000000 0,000000 0,000000 0,000000	Norm. Conc. 3,996878 88,893212 1,502592 4,002978 1,001595 0,200799 0,200999 0,050000 0,049900 0,050100 0,050100 0,050948 0,000000 0,000000 0,000000 0,000000 0,000000	Retention [s] 5.97 7.71 22,03 32,97 12,38 14,62 16,36 17,25 22,29 25,15 44,71 0,00	Area 49513,8111 925697,8401 22143,2796 63530,6756 55851,5291 13161,2786 13933,4059 3166,9130 3752,4623 3844,3802 4411,3769 0,0000	Height 5463670,7454 57944446,1729 664857,6117 1214006,2800 6701271,7125 1395326,3027 1384374,0881 304598,5274 278968,5323 282499,6063 208259,2481 0,0000	RF 8,072293E-05 9,602885E-05 6,300893E-05 6,300893E-05 1,525688E-05 1,525688E-05 1,525688E-05 1,329793E-05 1,303201E-05 1,303201E-05 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		

Print out of Application report



5 Quick Start-up

5.1 Introduction

This chapter is meant as a guideline for the operator to start-up the operation of the unit. It uses some of the information already given in the chapters before, but puts them now in a chronological order for a normal start-up procedure. This supposes that the unit is prepared for the actual site conditions, according to the customer's specifications.

Note: The above addresses or mapped or version numbers are just examples, the appearance of the window may also vary slightly. Since the function and the procedure is the same but will not constitute error represents

5.2 Build a connection



Double-click the RGC 3000 icon on your desktop and and fill out the following dialog as shown. (Default Settings) then click OK.

RGC 3000	×
User Name: admin	
Password: demo	
Instromet RGC 3000 license	
OK Cancel Change	

After a message window appeared with the version number for a few seconds, the configuration window will open with an overview of the gas chromatograph, which is set up on the PC.

RGC 3000 (Admin)	
File Control Help	
Control	
60700235 EnCal 3000 Off	EnCal 3000
Configured Instruments	
# Serial Title Connection	elster
1 60700235 EnCal 3000 10.49.124.232	Instromet
	® Agilent Technologies, 2012 Elster Instromet
Click right mouse button on an instruments icon to perform instrument operations.	

Double-click the icon of the unit in the field to open RGC 3000.



5.3 Instrument Status

First the status of the unit needs to be checked. To open **Instrument Status** use the menu shown or click on the highlighted icon.





Instrument Status-window has typically the following appearance:

Instrument			Er						
Automation:									
State: Idle			Run II) #:	0				
Sample type: Analys	sis		Seque	ence line #:	0				
Sample stream #: 0	0		Line r	eplicate #:	0				
Flushing time: 🖕			Seq. r	epeat #:	0				
Calib.Level.: 0									
<u> 30:</u>									
nstrument State:		Ready							
Sample line temp [°C]:		n/a							
Error Status:		'Init passed'							
GC channel:	Chan		Chanr			Chan	nol 9	Chan	nol 4
<u>56 channel.</u>	Set	Act	Set	Act		Set	Act	Set	Act
Column temp. [°C]:	60	60.0	65	65.0		n/a	n/a	n/a	n/a
njector temp. [°C]:	50	50.0	50	50.0		n/a	n/a	n/a	n/a
Column pressure [kPa]:	110	110.3	110	110.8		n/a	n/a	n/a	n/a
Autozero (mV):		-68.292		-47.967		1.0.54	n/a	1.0.54	n/a
		-00.202		-47.007			112 CI		LIV CI

The green colour indicates the user defined set-points. Actual values are displayed in blue in case they are within the internally defined limits of the device, and in red if outside these ranges. The latter case means that the unit is not yet in stable operation conditions (for example injector temperature not yet stable).

Normally stable conditions are reached within 5 minutes.



5.4 Calibration settings

If the gas chromatograph was not supplied with the calibration gas, calibration adjustments must be made. This is done in **Peak Identification** in menu **Method**.

R	GC 30	00 - #60)500202-En	Cal 3000: Re	ady i		
File	View	Method	Application	Automation	Control	Report	Window Help
	¥ 🖬		ment Setup . ation Events			2	
			dentification Calibration				
		Advan	iced				
		Prope	rties				

For standard applications, the column level 1 for the concentrations of the calibration gas used.

																		-
R P	eak lo	dentification / Calib	oration: Chan	nel 1														
#	Activ	e Peak Name	ID	Ret.Time	Rel.Ret.Window	Abs.Ret.Window	Reference	Selection Mode	Rel.Ret.Peak	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8 Ru	w
1	V	Nitrogen	1	5,97086	5	5		0. Nearest		3,9969	0	0	1			0	3,9969	_
2	V	Methane	2	7,713597	5	5		0. Nearest		88,8937	0	0		S P		0	88,8937	
3	V	CO2	3	20,02209	5	5		0. Nearest		1,5026	0	0		JI		0	1,5026	
4	V	Ethane	4	32,9556	5	5		0. Nearest		4,003	0	0			v	0	4,003	
•																		1

When using a multi-level calibration for daily calibration column level 8 is to use.

Warning: Use only appropriate calibration gases (see Section 4.3 Calibration)

The calibration parameters must be set for all channels. Select the appropriate channel in the header of the RGC 3000 software (as shown below). The menu item **Peak Identification** remains open.

RGC 30	00 - #60500202-EnCal 3000; Connecting
File View	Method Application Automation Control Report Window Help
	🎒 🛿 1: CP-4900 Column Mod 💌 📃 💐 🛃 🥔 🖉 🗐 🖾 🜌 🖃 🗔 🗟 🤔
	1: CP-4900 Column Mod
	2: CP-4900 Column Mod

Check also the calibration time in Automation/ Sequence, tab sheet Calibration Properties:

Sequence Table	Verification Table	Calibration Table
Sequence Properties	Verification Properties	Calibration Properties
tivate Calibration Table on the following events:		
On Sequence Startup		
When sequence is running		
O On Runs Performed [runs]:		
O On Time Elapsed [hours]: 1		
On Fixed Time: Hour: 6 Minute: 0	Once Every n days: 1	
C None		
On Verification Failure		

In the above example the unit will be calibrated daily at 6 AM, but this is of course site specific.



Finally check the alarm limits, which are also customer specific.

The alarm settings are defined in Application / Alarms

🔣 RGC 3000 - #	60700235-EnCal 30	00: Ready
File View Method	Application Automation	n Control Report Window Help
D 🖻 🖬 🎒	Normalize Calorific Power	- 144 🖉 🕯 🖓 🖉 🖻 🗆 🗧 😗
	Verification Check	
	Alarms	
	Timed Relays	
	Analog Inputs	
	Digital Inputs	
📥 Alarms		
Alarm Se	ttings	Alarm Table
Alarm Se Alarming parame	ters	
🔽 Alarm table e	nabled	

		Alarm Settings		Alarm Tabl	e	L			
#	Active	Param Type	Parameter	Minimum	Maximum	Alarm On	Invert Alarm	Relay Alarm	Relay#
1	M	4. Verifications	3. Unknown peaks detected	0	0	5. All			0. None
2	M	3. Sample results	1. Sum ESTD	35	45	5. All			0. None
3	M	6. ISO 6976 Results	5. Hs	35	45	5. All			0. None
4	M	6. ISO 6976 Results	8. Rel. Density	0.55	0.75	5. All			0. None
5	M	4. Verifications	4. Calibration alarm	0	0	5. All			0. None
6	M	2. Normalized Amounts	1. Nitrogen (chan 1)	0	10	5. All			0. None
7	M	2. Normalized Amounts	2. Methane (chan 1)	70	100	5. All			0. None
8	M	2. Normalized Amounts	3. CO2 (chan 1)	0	10	5. All			0. None
9	M	2. Normalized Amounts	4. Ethane (chan 1)	0	10	5. All			0. None
10	M	2. Normalized Amounts	5. Propane (chan 2)	0	5	5. All			0. None
11	M	2. Normalized Amounts	6. i-Butane (chan 2)	0	1	5. All			0. None
12		2. Normalized Amounts	7. n-Butane (chan 2)	0	1	5. All			0. None
13	M	2. Normalized Amounts	8. neo-Pentane (chan 2)	0	0.1	5. All			0. None
14	M	2. Normalized Amounts	9. i-Pentane (chan 2)	0	0.1	5. All			0. None
15	M	2. Normalized Amounts	10. n-Pentane (chan 2)	0	0.1	5. All			0. None
16	M	2. Normalized Amounts	11. n-Hexane (chan 2)	0	0.1	5. All			0. None
17	M	2. Normalized Amounts	12. n-Heptane (chan 2)	0	0.1	5. All			0. None
18	M	2. Normalized Amounts	13. n-Octane (chan 2)	0	0.1	5. All			0. None
19									



5.5 Sequence settings (ordering)

Check the sequence settings:

File View Method Application	Automation	Control	Report	Window Help
🗅 😂 日 🎒 1: CP-4900 Columr	Sequence		2	
	Site Information			
	Modbus Se	etup		
	FTP Servic	e		
	Real Time Clock			
	Reprocess	List		

The following dialog box appears

7	× Sequence		
	Sequence Table	Verification Table	Calibration Table
	Sequence Properties	Verification Properties	Calibration Properties

Select tab sheet Sequence Table:

ſ	S	equence Properties	Verifi	cation Properties	Ca	alibration Properties		
	Se	equence Table) Verifi	cation Table)́Са	Calibration Table		
	#	Sample Type	Replicates	Calib.Level	Stream #	Flush time (s) 🔺		
	1	1. Analysis	1	1	1	150		
	2	1. Analysis	2	1	2	150		
	3	1. Analysis	1	1	3	150		

Change the sequence of sample streams according to the site specifications.



5.6 Report settings

If reports need to be generated on hard disk, the parameters which need to be stored need to be selected.

Select **Advanced** in the menu **Method**:

il e	RGC 30	3000 - #60700235-EnCal 3000: Ready	
File	View	Method Application Automation Control F	eport Window Help
	2	Instrument Setup Integration Events	14 🖉 🔿 🖓 🖉 🖃 🖳 🙎
		Peak Identification Peak Calibration	
		Advanced	
		Properties	

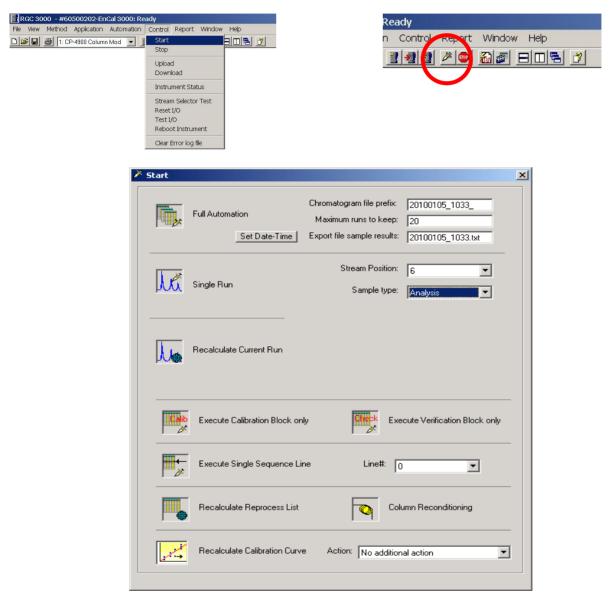
🍓 Method Advance	d Settings		
Export to file	Export to MLink32		
Export Results settin	ngs		_
🔽 Export enabled			
Export parameters a	vailable:	Selected:	
Height Unnorm. concentra Response Factors	tion	Retention Area Normalized conc. Energy Meter Ambient Temp., Pres.	
		1	

Activate "Export enabled" and select the parameters which need to be stored on hard disk with the black arrows.



5.7 Continuous Analysis

The unit is now ready for continuous analysis. Select **Start** in menu **Control** or click the appropriate icon in the toolbar:



If you want to store the reports on hard disk using RGC3000, make sure to define the settings for the export file:

 Maximum runs to keep: Export file name: limited by the size of the hard disk Export file name

The reports (in ASCII format) will then be stored in the Export directory underneath the directory automatically created on the hard disk for the connected unit, with the serial number of the unit as name.

Select Full Automation to start-up continuous analysis.

EnCal 3000 – Software Manual