

EnCal 3000 Quad Gas Chromatograph Software Manual

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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 Quad (Measuring unit and an optional Encal3000 controller)



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.



😓 RGC 3000 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	Ŧ
 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".

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

Leave this advice with a click on "Next"



RCC 2000 Seture	
C 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, e 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 >	Cancel

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 war folder, you can either type a new name, or select an existing folder from the list.	nt to use the default
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		8
?	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

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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><u>N</u>ext > <u>C</u>ancel</u>

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 Cancel

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> ancel	

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 location, either type in a new path, or click Change to browse for an existing folder.
Install HistoryLog to:
c:\HistoryLog Change
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 of folder, you can either type a new name, or select an existing folder from the list.	lefault
Shortcut Folder:	
Chromatography	-
 Install shortcuts for current user only Make shortcuts available to all users 	
< <u>B</u> ack <u>Next</u> > <u>C</u> ance	!



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 compute	er.
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	Cancel

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".



S Micro GC Firmware Update Tool Setup	8	X
Installation Folder Where would you like Micro GC Firmware Update Tool to be installed?	He he	
The software will be installed in the folder listed below. To select a different local new path, or click Change to browse for an existing folder.	tion, either type	e in a
Install Micro GC Firmware Update Tool to:		
C:\Micro-GC Tools\Firmware Update\2.30	Change	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	ant to use the o	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.



🎭 Micro GC Firmware Update Tool Setup	6	
Ready to Install You are now ready to install Micro GC Firmware Update Tool 2.30	- Alt	
The installer now has enough information to install Micro GC Firmware Update 1 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> ance	

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 🔹 🍣 UpdateA
--

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
1977 - 1994 - 1994 - 1994 - 1994 - 1994	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:



🔍 Update Micro GC		
	UpdateFirmware	
	⊂Internet Protocol (TCP/IP)	Properties:
	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	ev. 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.

💙 Update 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
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	v. 2.1.0.24088 Copyright(C)	2013 Agilent Technologies
Wait till Micro GC is rebool	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	
	 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	ev. 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 : adn : den	าin าง		
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
dmin:	admin	admin
ervice:	service	demo
ead 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".



RGC 3000 (Admin)		Z - • x
File Control Help		
	Control	
	Configured Instruments	EnCal 3000
# Serial	Title Connection	olstor
		Instromet
		© Agilent Technologies, 2014 Elster Instromet
Select 'File' - 'New Instru	ment' to configure a new instrument	
Calact 'File' - 'New Instau	mant' to configure a new instrument	© Agilent Technologies, 2014 Elster Instromet

Choose "New Instrument "in File-Menu.





nstrument Type:	EnCal 3000	
Gerial Number:	××××××	Ra
ītle:	EnCal 3000	L

Select "Configure"

🥴 En	Cal 3000 Con	figuration (Adn	nin)				
_ Ethe	ernet Communicati	ion Setup			Se	rvices	
ю	Address: 10	190 6	10	Colum ID address		Calibrate pre	essure sensors
н г Г	Address. j To	J 130 J 6.	5 1 10	<u>Setup IP address</u>]	Reboot 6	0.02100
						1160001	Incar Jobb
⊢ 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 sampl	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	Reset	Config
			<u>0</u> K	Cancel			

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



👔 Setup Ethernet (Connection	×
-Select IP address -		1
IP Address:	0 . 190 . 65 . 10 Ping	Close
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	IP address, make sure the instrument is started in BOOTP mode.	
# IP addres	s 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	t Connection	8
CSelect IP address		
IP Address:	0 190 65 10 Ping	<u>C</u> lose
⊢Assign new static IP	address	1
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 instrument is started in BOOTP mode.	
Detected EnCal 300)0's	
# IP addres:	s serial number controlled by workstation	
1. 10.49.	124.232 60700235 free	
1	Find ExCal 2000's an the submet	

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.

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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"

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 inst	rument 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	ıfig 📉 🗶
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	0 . 190 . 65 .	10 Ping	Close
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	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)

The procedure for assigning an IP address depends on which main board your GC has installed. This procedure is for GC's with main board G3581-6500. For GC's with old main board CP740010, follow the procedures described in the previous pages. Upon arrival from the factory, the GC has a default static IP address



configured. The active IP address is specified on the sticker together with the MAC address and the main board serial number (see following table)

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

1. To complete this procedure, the Micro GC must be in static IP address Mode. To verify this, be sure the DHCP switch, is in the left position. 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.
- 5. On the web page, click **Network**.
- Log in as administrator. Use the factory default login and password: Login name: admin Password: agilent

The server 192 username and	2.168.1.10 at Web Server Authentication requires a password.
Warning: This sent in an inse connection).	server is requesting that your username and password be cure manner (basic authentication without a secure
	admin •••••• Image: 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.

• • • • • • • • • • • • • • • • • • •	90.206/	✓ 4+ X Google	
Favorites A90 Micro G	ic		
A survey	a bara bara bara		
Aglient le	cnnologies	490 MICRO GC	
	Configuration: Netw	vork - Overview	
tatus	The everyiew below s	shows this instruments currently active network configuration and how this	
<u>rmware</u>	configuration was obt	configuration was obtained.	
ontrol	Configuration source	Kernel command line, DHCP or BootP	
<u>eset</u>	MAC Address	00:30:D3:21:09:34	
onfiguration	IP Address	156.141.90.206	
etwork	Subnet mask	255.255.255.0	
anies	Delault gateway	150.141.50.1	
aintenance			
Juale	Configuration: Netw	vork - Manual configuration settings	
e rvice pload	Below shows this ins	Below shows this instruments manual TCP/IP configuration parameters can be altered.	
	Note 1: If DHCP mod	Note 1: If DHCP mode is active, configuration parameters will be saved, but remain inactive until	
Support Agilent	DHCP mode is deaction on the back of the ma	vated. DHCP mode can be activated and deactivated using the DHCP DIP switch ainboard. After operating DHCP DIP switch, a restart (warm or cold) is required.	
	Note 2: If DHCP mod immediately, leading	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, this	
	Note 3: Check if DHC overview above. If th configuration is active	CP mode is active or inactive by opserving the <i>Configuration source</i> in the the <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 dateway	192 168 100 1	
	Delault 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:

	. j io	49	124 232	Setup IP address		Calibrate pressure sensors
						Reboot EnCal 3000
nfin untice	oottingo					
Ha	ardware		User	RGC 3000	Automatio	n Info
			L		Max column	
		<u>GC Channel</u>	Heated Injector	Backflush to vent	temp. [°C]:	Detector
Chan	nel 1:	Installed	🦳 Installed	Installed	180	TCD
Chan	nel 2:	Installed	🦳 Installed	Installed	180	TCD 💌
Chan	nel 3:	Installed	🔲 Installed	Installed	180	TCD 💌
Chan	nel 4:	 Installed 	Installed	Installed	180	TCD
Comm	<u>on:</u>	Heated sa	mple line			
Availa	ble license	<u>18.</u>				
		PRO Licer	nse 🗆 Er	ergy Meter option	API chapter 2	1
		Modbus se	erial 🥅 Mo	odbus TCP/IP	🔽 Web server	
_						
I Vi	rtual EnCal	3000				
						1

After upload:

🧶 En	nCal 3000 Cont	figuration (Adm	in)			9	
Eth	ernet Communicati	on Setup			Se	vices	
						Calibrate pressure sensors	
IP	'Address: 10	49 124	232	Setup IP address		D. I. I. D. I. 0000	-
						Reboot EnLai 3000	
- Cor	ofice mation settings						
ſ	Hardware		Iser	RGC 3000	Automation	Info	
			I			I	
		GC Channel	Heated Injector	Backflush to vent	Max. column temp. [°C];	Detector	
	Channel 1:	Installed	✓ Installed	Installed	160	TCD 🔹	
	Channel 2:	Installed	🔽 Installed	Installed	180	TCD 💌	
	Channel 3:	Installed	Installed	Installed	180		
	Channel 4:	Installed	Installed	Installed	180		
	Common	F Heated sample	line				
	Available licens	es:					
		🔽 PRO License	🔽 Ene	rgy Meter option	API chapter 21		
		🔽 Modbus serial	🔽 Maa	dbus TCP/IP	Veb server		
	🔲 Vitual EnCa	al 3000					
Inst	rument serial numb	er: 6070023	5		Upload Config	Beset Config	
	\$		<u>O</u> K	Cancel			

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 gas</u>			
Channel 1:	🔲 Disabled	Helium	•		Download
Channel 2:	🔲 Disabled	Helium	•		
Channel 3:	🔲 Disabled	Helium	-		
Channel 4:	🔲 Disabled	Helium	-		
<u>Common:</u>	I Continuous flo I Peak simulatic Flush cycles: N	w n one 💌]	Activated Licenses: ✓ PR0 activated ✓ Energy-Meter option a ✓ API 21 logging option	ctivated activated

Example EnCal 3000

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.
------------------------------------	--------------

Hardware	User	PROstation	Automation	Info
<u>Channel 1:</u> □ Di Channel 2: □ Di Channel 3: □ Di Channel 4: □ Di <u>Common:</u> ▼ Co Flush	nel disabled Carrier gas sabled Helium sabled None		Activated Licenses: PRO activated Energy-Meter option at API 21 logging option a	Download ctivated activated



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
Channel 1: Channel 2: Channel 3:	Description [CP-4900 [CP-4900	<u>n:</u> Column Module, 40cm HS/ Column Module, 5CB Heat	A Heated I ed Inject		
<u>Common:</u> Pressure units:	kPa	T			
User Application	<u>Settings:</u> 1	•			

Example EnCal 3000 (2 Channels)

Hardware	Ì	User	PROstation	Automation	Info
	<u>Descrip</u>	tion:			
Channel 1:	40cm H	ISA Heated Injector, for Ins	tromet		
Channel 2:	8m 5CE	3 Heated Injector, for Instror	net		
Channel 3:	CP-490	0 Column Module, 5CB Hea	ated Inject		
Channel 4:	10m PF	PU Unheated Injector, Elste	ſ		
<u>Common:</u> Pressure units: <u>User Applicatior</u> Instrument #:	kPa n Settings	• •			

Example EnCal 3000 Quad (4 Channels)

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



Select tab Automation

🏥 EnCal 3000 Configuration (Admin)	
Ethernet Communication Setup	
Calibrate gressure	e sensors
IP Address: 10 16 1 91	2000
	3000
Configuration settings	
Hardware User PROstation Automation	Info
I/O: To be used Available Stream Selector Alarm Relays: 3 8 Streamer Type: Relays (solenoids) Do Alarm Relays: 3 3 Stream Selector Do Timed Relays: 3 3 Stream Selection requests from a host system Do Digital Inputs: 3 3 Stream Selection requests from a host system Do	wnload
Analog Outputs: 0 0 Analog Inputs: 2 6 Comport VICI: Not used Baudrate:	<u>Somm.</u> 9600
Extension board detection: LCD Display: Not connected Databits: 8 Board#: 0 Modbus: Comport 1 Stopbits: 1 0 Address: 1 Next Next Not connected Parity: Not connected Not connected 0	▼ ▼
Show I/O Configuration miscellaneous: Postpone run till external 'Ready In'	
Instrument serial number: 61100591 Upload Config Reset Config	g
<u>QK</u> <u>C</u> ancel	

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



Select tab Info

onfiguration settings				
Hardware	User	│ RGC 3000 │	Automation	Info
EnCal 3000 Softw. MPU: 2,21 I/O Controller: RGC 3000 InstDataExchange.dll: Gc_dll.dll:	are version D build 22375 1,15 3,00 build 004 1,40 build 002	Firmware I/O Ext. Channel 1: 1,00 Channel 2: 1,00 Channel 3: - Channel 4: -	Serial# Analy.I Module 60156 61113 -	Part number# 490103 74136350 -
nstrument serial number:	61000486		Upload Config	Reset Config

Example EnCal 3000 (2 Channels)

Hardware	User	PRO)station	Automation	Info
Micro-GC: Softw MPU: 2.2 I/O Controller:	are version 0 build 19606 1,15	Channel 1: Channel 2: Channel 3: Channel 4:	Firmware I/O Ext. 1.00 1.00 1.00 1.00 1.00	Serial# Analy.I Module 64819 64260 55230 62551	Part number# 74136450 74136350 74136550 74286150
<u>PROstation:</u> InstDataExchange.dll: Gc_dll.dll:	2,20 build 006				

Example EnCal 3000 Quad (4 Channels)

This tab shows the version number of the installed software.

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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
I	<u>0</u> K	<u>C</u> ancel		

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

🎂 Configure Instr	ument	8 🛛
Instrument Type:	EnCal 3000	Configure
Serial Number: Title:	60700235	I .
OK	Cancel	

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



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

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:

Instrument	Instrument			hanced					
Automation:									
State: Idle			Run IE) #:	0				
Sample type: Analy	sis		Seque	ence line #:	0				
Sample stream #: 0	0		Line n	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	nel 1	Chanr	nel 2		Chan	nel 3	Chan	nel 4
	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
	50	50.0	50	50.0		n/a	n/a	n/a	n/a
Injector temp. [°C]:	110	110.3	110	110.8		n/a	n/a	n/a	n/a
Injector temp. [°C]: Column pressure [kPa]:	110								

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				_ 🗆 ×
Instrumen	Instrument		nced	<u> </u>
Power Supply [V]:	11.9	Analog In #1:	0.0000	External Ready In: n/a
Battery 1 Supply [V]:	n/a	Analog in #2:	0.0000	External started: False
Battery 2 Supply [V]:	n/a	Analog in #3:	0.0000	Digital Input received:
Cabinet temp. [°C]:	26	Analog in #4:	0.0000	
Cabinet pressure [kPa]	100.4	Analog in #5:	0.0000	
Method Protection:	On(locked)	Analog in #6:	0.0000	

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 Statu	ıs			
Instrum	nent	Enha	nced	<u> </u>
Power Supply [V]: Battery 1 Supply [V] Battery 2 Supply [V] Cabinet temp. [*C] Cabinet pressure [kf Method Protection:	11,9 11,9 1 n/a 26 29a): 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	External Ready In: n/a External started: False Digital Input received: 000
	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 3000: Ready	Ready
Pier View Weblod Application Adjoinator Control Report Window Hep	n Control Report Window Help
Upload	
Download	
Instrument Status Stream Selector Test	
Reset I/O Test I/O	
Reboot Instrument	
A carrie	
> Start	
	Chromotogram Go graffin
Full Automation	Chromatogram hie preix. Run_
	Maximum runs to keep: 0
Set Date-Time	Export file sample results: Export.txt
	Stream Position: 1
Single Run	
poor	Sample type: Analysis
Recalculate Current Run	
p O Nak	
Execute Calibration Block	only Execute Verification Block only
, <u> </u>	
Execute Single Sequence	eLine Line#: 0 ▼
· · ·	
Recalculate Reprocess L	ist 🛛 🙀 Column Reconditioning
	,
Recalculate Calibration C	urve 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 🗙
<u>.</u>	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	$10 \times$
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 Quad 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.

1 60	500225	Ready													6		
File V	iew Meth	nod Application Automation Cont	rol Report Wind	low Help													
		🛐 1: CP-4900 Column Mod 💌 📋		🔍 🔬 🜌		3											
📅 A 🖬	plicatio	on Report						👔 Instrument Status								_ 0	Þ^
SAM	PLE		ENERGY			ENVIRON *		Instrument		γ	Enhan	ced	Ì				
Samp	ling Time	05/10/2012 14:16:34	Calc.Meth	od I	50 6976	Sampling A											
Run	lumber	16	Compressi	bility C	,99759	Sampling Aı		Automation: State: Idlo			Lastre	enorted run # 68					
Hun I	ype See Leve	Analysis	Molar Mas	s 1	8,62309	Sampling Ai		Sample type: Analysis	3		Seque	nce line #: 0					
Stream	ation Leve	1	Molar Mas Rel Densit	snatto u 	1,64300	Sampling Al		Sample stream #: []	7		Line re Sec. n	eplicate #: 0					
Alarm	Status	' ∩к	Ahs Densi	y c hu f	83287	Sampling Ar		Calib.Level.: []			50q.1	opour					
Sum B	ESTD	97.2470	Hs	1	0.02711	Cabinet Ter		GC:									
Sum B	stimates	0,0000	Hi	9	05116	Ambient Pre		Instrument State:		Ready							
Sum /	Areas	1048417,0840	Wobbe Su	ip. 1	2,49321	Digital in #1		Sample line temp ["C]: Error Status:		n/a							
Total	Peaks	26	Wobbe Inf	1	1.27722	Dicital in #2 💌	1										
#	Channel	Peakname	ESTD Conc.	Norm. Conc.	Retention [s]	Area 🔺	1				~		~				
1	1	Nitrogen	11,586963	11,914978	5,82	136412,6264	1	<u>Guicnanne:</u> U	nanne et	Act	Set	Act	Set	Act	S	iannei 4 st Ac	zt
2	1	Methane	80,347591	82,622149	7,67	798795,8585		Column temp. [*C]: 6	0	60,0	80	80,0	n/a	n/a	n.	a n/	a
3	1	C02	1,402546	1,442251	20,14	19628,6142		Injector temp. [*C]: 7	0 40	70,0	105	105,0	n/a	n/a n/a	n	′a n/∶ ∕o n/i	a
4	1	Ethane	3,121543	3,209911	32,77	47235,2372		Autozero [mV]:	40	-47,967	200	9,756	112 01	n/a		a 11/- n/-	a
5	2	Propane	0,489777	0,503642	14,73	26090,6122											
7	2	n-Butane	0,070040	0,000000	18.46	5866 0472											Ξ
8	2	neo-Pentane	0.005980	0.006149	19,28	389.4828											
9	2	i-Pentane	0,023085	0,023738	23,73	1628,2571 -	1										
4			-			•	1		_								_
🛯 🖓 CI	nannel 1	: CP-4900 Column Module, 4)cm HSA Heate				1	Channel 2: 8m 5CB Heate	d Inj							_ 0	X
	550 -						Г		_								_
	500	1,79s, 164,82233mV					L	67,4s, 3868,23901m	4								
	450						L	1000									
	400						L	3500					111				
	200						L	3000									-
	350						L	2500									
m\v	000						L	mV									
	250	· · · · · · · · · · · · · · · · · · ·					L	2000 -									
	200						L	1500		<u>e</u>							-
	150						L	1000	. <u>.</u>								
	100	e e					L		iexar	e cyck		e				g	
	50						L	500 -		ethyl oluer		10 				- Ko	
	0						L				Η.				-		-
	Ó	50 100	150	20	0 25	0 300		0 50		100		150	200		250		30(🗸
<																	>
Meth.:	GC2AF_ne	w.pmet Appl.: 60500225.papp	Seq.: huangpi3.ps	eq Modb.	: 61200772.pmbs	FTP: 041212.pftp		Data: 20121005_1226_1.pdat	Repr	ocess:							_ //
Instrum	ent 60500.	225-EnCal 3000		Cont	rot: 10.49.124.234	Ready		Idle									11.



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	?≍ I RGC 3000 - #60500202-EnCal 3000; Ready							
Save in: 🗀 Meth	thod	▼ = 1 = 1		File View Method Application Automation Control Re	eport Window Help			
Pecani Pecani Desktop Pecal 3000 My PC Network File gam Save as	ne: New s type: Method files (* pmet)	<u>ع</u> م	jeve ancel	Image: Contract of the contra				



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 Comm	

Example EnCal 3000

🚹 Instrument S	etup	
🔞 Channel 1	🔞 Channel 2 🥘 Channel 3 🔞 Channel 4 Common	

Example EnCal 3000 Quad



Tab Sheet Channel (1 – 4)

			1	
Column temperature:	65	°C	Run time:	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 💌	🔲 Invert signal		
Pressure mode:	Static C Pr	ogrammed		
Initial pressure:	150	kPa		
			Carrier Gas:	Helium
			Channel description:	CP-4900 Column Module, 40cm HSA Heato

Tab Sheet Common.

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



3.7 Window Integration events (Menu Method)

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

🔣 RGC 3	000 - #60700235-EnCa	l 3000: Ready
File View	Method Application Auton	nation Control Report Window Help
	Instrument Setup Integration Events	▥▾ ▮◢◁ ề⊜ ‱# ⊟□≒ ४
	Peak Identification Peak Calibration	
	Advanced	
	Properties	_

Integration events contains a list per channel of integration actions which have to be taken during the analysis. When using an EnCal 3000 Quad up to four channels are possible. The submenu is illustrated in the following chapters.

Щ Ir	🖳 Integration Events: Channel 1											
#	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	M	3. Double Peak Width Now	15	0								
7	_	2. Set Threshold [10 nV]	15	1								
8	V	2. Set Threshold [10 nV]	28,5	0,5								
9	∠	14. Turn Integration Off	60	0								

🗓 In	tegratio	n Events: Channel 2		
#	Active	Event ID	Start Time	Value
1	\mathbf{r}	14. Turn Integration Off	0	0
2	\checkmark	1. Set Peak Width [s]	0	0,5
3	\mathbf{i}	10. Set Minimal Area	0	5
4	\mathbf{i}	13. Turn Integration On	14	0
5	\sim	22. Baseline Valley To Valley On	14	0
6	\sim	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

H In	tegratio	on Events: Channel 3		
#	Active	Event ID	Start Time	Value
1	<	14. Turn Integration Off	0	0
2	\sim	10. Set Minimal Area	0	5
3	\sim	1. Set Peak Width [s]	0	1
4	\checkmark	2. Set Threshold [10 nV]	4	1
5	✓	13. Turn Integration On	4	0
6		3. Double Peak Width Now	15	0
7	\checkmark	2. Set Threshold [10 nV]	18	0,05
8	\checkmark	22. Baseline Valley To Valley On	18	0
9	\checkmark	2. Set Threshold [10 nV]	33	0,02
10	\checkmark	23. Baseline Valley To Valley Off	40	0
11	\checkmark	1. Set Peak Width [s]	61	3
12	\checkmark	2. Set Threshold [10 nV]	61	0,01
13	\checkmark	22. Baseline Valley To Valley On	61	0
14	\checkmark	2. Set Threshold [10 nV]	105	0,007
15	\checkmark	1. Set Peak Width [s]	105	5
16	\checkmark	2. Set Threshold [10 nV]	117	0,01
17	\checkmark	14. Turn Integration Off	180	0

In	tegratio	on Events: Channel 4		
	Active	Event ID	Start Time	Value
	\mathbf{r}	14. Turn Integration Off	0	0
	\checkmark	1. Set Peak Width [s]	0	0,5
	\checkmark	10. Set Minimal Area	0	10
	\checkmark	13. Turn Integration On	15	0
	V	22. Baseline Valley To Valley On	22	0
	V	2. Set Threshold [10 nV]	15	1
	V	23. Baseline Valley To Valley Off	35	0
	V	2. Set Threshold [10 nV]	35	0,01
	\mathbf{i}	22. Baseline Valley To Valley On	40	0
)	\mathbf{i}	1. Set Peak Width [s]	40	2
	\checkmark	1. Set Peak Width [s]	47	1
2	\checkmark	2. Set Threshold [10 nV]	55	0,5
3	V	1. Set Peak Width [s]	60	3
Ļ	V	1. Set Peak Width [s]	155	25
5	V	14. Turn Integration Off	300	0



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	
	Peak Identification Peak Calibration	
	Advanced	
	Properties	

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

R P	Peak Identification / Calibration: Channel 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	\checkmark	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
•													

Po	Peak Identification / Calibration: Channel 2												
#	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	\checkmark	Propane	1	15,3675	5	5		0. Nearest		1,01	0	0	0
2	\checkmark	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	\checkmark	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	\checkmark	n-Nonane	10	272,1275	5	5		0. Nearest		0,0021	0	0	0
•													►

I P	🕽 Peak Identification / Calibration: Channel 3												
#	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	\checkmark	n-C8	1	13,64	5	5		0. Nearest		0,0073	0	0	0
2	\checkmark	n-C9	2	21,8425	5	5		0. Nearest		0,0021	0	0	0
3	\checkmark	n-Decane	3	36,3975	5	5		0. Nearest		0,00106	0	0	0
4	\checkmark	n-Undecane	4	63,37	5	5		0. Nearest		0	0	0	0
5	\checkmark	n-Dodecane	5	110,9	5	5		0. Nearest		0	0	0	0
•													

R P	Reak Identification / Calibration: Channel 4												
#	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	$\mathbf{>}$	C2H6	1	26,975	5	5		0. Nearest		4,02	0	0	0
2	\mathbf{i}	H2S	2	44,88	5	5		0. Nearest		0	0	0	0
3	\mathbf{i}	COS	3	52,5	5	5		0. Nearest		0	0	0	0
4	\checkmark	C3H8	4	60,7225	5	5		0. Nearest		1,01	0	0	0
•													►



3.9 Window Peak Calibration (Menu Method)

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

ill R	RGC 3000 - #60700235-EnCal 3000: Ready											
File	View	Method Application Auto	nation Control Report Window Help									
	2	Instrument Setup Integration Events Peak Identification Peak Calibration	100 ⊻ 🖁 🧐 🖉 🔎 🖓 🚮 ⊟ 🔲 🖷 🝸									
		Advanced										
		Properties										

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: Abs.	Channel Independent Settings: Total Calibration Levels.: 1 Calibration Check: Initial Calibration: Use GOST Calibration Retention Window Update: 1. Calibration
Calibration Results Nitrogen Methane CO2 Ethane	Changelist Scale Full screen 0
Sample Level 1 Area (Amount) 1 49513,811069 (3,996900)	



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

🔡 R	GC 30	000 - #60700235-EnCa	l 3000: Ready
File	View	Method Application Autom	nation Control Report Window Help
	2	Instrument Setup Integration Events	
		Peak Identification Peak Calibration	
		Advanced	
		Properties	

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

set the set of the set	
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.

M. No	ormaliz	ation Table									
#	Active	Peak Name	Channel	Ignore	Bridge Comp #	Estimate	Estim.Conc	Test.Conc	RefConcPeak#	RefPeakConc%	Group#
1	Z	Nitrogen	1		0. None	\checkmark	0	0	0	0	0
2	\sim	Methane	1		0. None	\checkmark	0	0	0	0	0
3	\sim	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	\checkmark	0	0	0	0	0
15	\checkmark	n-Decane	2		0. None	\checkmark	0	0	0	0	0
16	\checkmark	Benzene	2		0. None	\checkmark	0	0	0	0	0
17	\checkmark	Cyclohexane	2		0. None	\mathbf{M}	0	0	0	0	0
18	\checkmark	Methylcyclohexane	2		0. None	$\mathbf{\Lambda}$	0	0	0	0	0
19	\checkmark	Toluene	2		0. None	\mathbf{M}	0	0	0	0	0
20	\checkmark	n-Undecane	2		0. None	\mathbf{M}	0	0	0	0	0
21	\checkmark	n-Dodecane	2		0. None	\mathbf{M}	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	\checkmark	Oxygen	2		0. None	\checkmark	0	0	0	0	0
25	\checkmark	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.

🗜 Calorific Power				
Calculation Metho	d Component Const	ants		
Calculation Method				
ISO 6976	Caloric Units Conversion Factor:	MJ/m3 -> KWH/m3	-	
C GPA 2172				
C ASTM D3588	Sum C6+ unidentified compor	nents		
C GOST-22667	Channel number C6:	2. Channel 2	•	
	Identify C6 component:	11. n-Hexane	-	
Method Settings				
Ĩ				
Reference Temperature:	273.15 K 🔹			
Compressibility Air (Zair):	0.99941			

	Calci	ulation Method	Сотро	onent Const	ants		
#	Active	e Component Name		Hs	Hi	SF	MW
1	V	1. Nitrogen	1	0	0	0	28,0135
2	√	2. Methane	2	39,82	35,88	0	16,043
3	\checkmark	3. CO2	3	0	0	0	44,01
4	√	4. Ethane	4	70,31	64,36	0	30,07
5	M	5. Propane	5	101,21	93,18	0	44,097
6	√	6. i-Butane	6	132,96	122,78	0	58,123
7	√	7. n-Butane	7	133,8	123,57	0	58,123
8	√	8. neo-Pentane	8	169,27	156,63	0	72,15
9	√	9. i-Pentane	9	169,27	156,63	0	72,15
10	√	10. n-Pentane	10	169,27	156,63	0	72,15
11	M	11. n-Hexane	11	187,4	173,17	0	86,177
12	M	12. n-Heptane	12	216,88	200,55	0	100,204
13	M	13. n-Octane	13	246,18	227,76	0	114,231
14	√	14. n-Nonane	14	276,33	256,23	0	128,258
15	M	15. n-Decane	15	306,48	284,7	0	142,285
16	M	16. Benzene	16	162,615	155,67	0	78,114
17	M	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-EnCal 300	00: Ready
File View Method	Application Automation	Control Report Window Help
D 🛩 🖬 🏼 🎒	Normalize Calorific Power	• 144 🎮 🍋 🏭 🖉 🖻 🖻 💈
	Verification Check	
	Alarms	
	Timed Relays	
	Analog Inputs	
	Digital Inputs	

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 Check				
Verification Settings	Verification Table]		
Verification parameters				
Verification Check				- - X
Verification Settings	Verification Table			
# Active Param Type	Parameter	Minimum	Maximum	
1 2. Normalized Amounts	1. Nitrogen (Chan 1)	80	1	
2 1. ESTD Amounts	2. Methane (Chan 1)	10	1	
3				

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.

📥 Alar	rms								
	Alarm Settings		Alarm	Table		$\overline{)}$			
Ala	rming parameters								
✓ Alarm table enabled									
rms									-
ırms	Alam Settings	ĭ	Alarm	ı Table					-
rms	Alam Settings Param Type	Parameter	Alarm	1 Table Maximum	Alarm On	Invert Alarm	Relay Alarm	Relay #	Invert Rela
rms Active	Alarm Settings Param Type 2. Normalized Amounts	Parameter 1. Nitrogen (chan 1)	Alarm Minimum 0	Maximum 22	Alarm On 5. All	Invert Alarm	Relay Alarm	Relay # 0. None	Invert Rela
rms Active	Alam Settings Param Type 2. Normalized Amounts 2. Normalized Amounts	Parameter 1. Nitrogen (chan 1) 2. Methane (chan 1)	Alarm Minimum 0 55	A Table Maximum 22 100	Alarm On 5. All 5. All	Invert Alarm	Relay Alarm	Relay # 0. None 0. None	Invert Rela
Active	Alam Settings Param Type 2. Normalized Amounts 2. Normalized Amounts 3. Normalized Amounts	Parameter 1. Nilogen (chan 1) 2. Methane (chan 1) 3. C02 (chan 1)	Alarm Minimum 55 0	Table Maximum 22 100 12	Alarm On 5. All 5. All 5. All 5. All	Invert Alarm	Relay Alarm	Relay # 0. None 0. None 0. None	Invert Rela
Active	Alam Settings Param Type 2. Normalized Amounts 2. Normalized Amounts 2. Normalized Amounts 2. Normalized Amounts	Parameter 1. Nitrogen (chan 1) 2. Methane (chan 1) 3. C02 (chan 1) 4. Ethane (chan 1)	Alarm 0 55 0 0	Table Maximum 22 100 12 14	Alarm On 5. All 5. All 5. All 5. All 5. All	Invert Alarm	Relay Alarm	Relay # 0. None 0. None 0. None 0. None	Invert Rela
Active	Alam Settings Param Type 2. Normalized Amounts 3. Normalized Amoun	Parameter 1. Nitrogen (chan 1) 2. Methane (chan 1) 3. CO2 (chan 1) 4. Ethane (chan 1) 5. Propene (chan 2)	Alarm Minimum 0 55 0 0 0 0	Table Maximum 22 100 12 14 5	Alarm On 5. All 5. All 5. All 5. All 5. All 5. All	Invert Alarm	Relay Alarm	Relay # 0. None 0. None 0. None 0. None 0. None	Invert Rela
Active	Alam Settings Param Type 2. Normalized Amounts 2. Normalized Amounts 2. Normalized Amounts 2. Normalized Amounts 2. Normalized Amounts 3. Normalized Amounts	Parameter 1. Nitrogen (chan 1) 2. Methane (chan 1) 3. C02 (chan 1) 4. Ethane (chan 1) 5. Propare (chan 2) 6. Houtane (chan 2)	Minimum 0 55 0 0 0 0 0 0 0 0 0 0 0 0	Table Maximum 22 100 12 14 5 5 1,5	Alam On 5. All 5. All 5. All 5. All 5. All 5. All 5. All	Invert Alarm	Relay Alarm	Relay # 0. None 0. None 0. None 0. None 0. None 0. None	Invert Rela
Active	Alam Settings Param Type 2. Normalized Amounts 3. Normalized Amoun	Parameter 1. Nitogen (chan 1) 2. Melhane (chan 1) 3. CO2 (chan 1) 4. Ethane (chan 1) 5. Propane (chan 2) 6. iButane (chan 2) 7. nButane (chan 2)	Alarm Mininum 0 55 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Table Maximum 22 100 12 14 5 1,5 1,5	Alarn On 5. All 5. All 5. All 5. All 5. All 5. All 5. All 5. All	Invert Alarm	Relay Alarm	Relay # 0. None 0. None 0. None 0. None 0. None 0. None 0. None	Invert Reize



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	RGC 3000 - #60700235-EnCal 3000: Ready											
File	View	Method	Application	Automation	Control	Report	Window	Help				
			Normalize Calorific Power		- 🔡	7	2					
			Verificatio Alarms	n Check								
			Timed Rel	lays								
			Analog In	puts								
			Digital Inp	outs								

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

0 <mark>2</mark> Ti	🛂 Timed Relays							
#	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 📃 🗖 🗙						
Gain	Offset					
4,41099353734102E-302	4,61864415153757E-62					
2,88299965706367E-144	3,23790861658519E-319					
	nputs Gain 4,41099353734102E-302 2,88299965706367E-144					

Called up by menu point **Digital Inputs** in **Application** menu:

🔣 Digital Inputs		×
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		1 🕤	2				
	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 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	

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
Protocol C MODICON C INSTROMET	T / 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 C Reverse	Comport Secondary: 0
☐ INT32 bit Type Conversion	Serial Transmission Mode
Normal C Reverse	C RTU © ASCII
Shift Modbus Addresses	



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	141 🖉 🚳 🚵 🔊 🖃 🗆 🖻 🙎						
	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.

Þ	🥦 Sequence							
	Sequence Table	Verification Table	Calibration Table					
C	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:

*	Seque	ence					
ſ	Sequence Properties			Verification P	roperties	Calibrati	on Properties
	Sequence Table		Ĭ	Verification Table		Calibrati	on 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:

🔀 Sequence								
ſ		Sequence Properties	Verification Properties			Calibrati	on Properties	
Sequence Table			ĭ	Verification Table		Calibrati	on 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	0. None 💌						
		0. None 1. Analysis 2. Calibration 3. Blank 4. Verification						

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 Flush	Stream Ahead Flushing	Stream Ahead Flushing	Stream Ahead Flushing	Stream Ahead Flushing
Injecti	on Injecti	ion Injecti	on Injecti	on Injection
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		
Sequence Table	Verification Table	Calibration Table
Sequence Properties	Verification Properties	Calibration Properties
Main Sequence ✓ Auto start sequence on power-up ● Run sequence continuously ● Times to repeat sequence Number of repeatings: 1 Run cycle time [sec]: 0 Stream Selector Home Position (on error and when sequence stops):	Ignore Cycle time for V Calibration runs I✓ Stream Ahea	erification and
Auto start sequence on power-up	- Automatic sta	rt of the sequence for switching

•	Auto start sequence on power-up.		Automatic start of the sequence for switching.
•	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:	d	Ignore duration of verification and calibration pass.
•	Home Position:	This is in case physic	either 0 (if all stream select valves need to be closed e of errors or when the sequence stops), or one of the ally connected streams
•	Stream Ahead Scheduling:	Selecte to anal selecte Analys	ed by default, if this option is activated the next stream yse would be flushed during the actual analysis. If not ed an extra flushing time is needed before the next is 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.

Calibration Settings	
Response Mode: Area Channel Independent Settings: Calibration Mode: External Standard Total Calibration Levels.: 1 Calibration Mode: External Standard Calibration Check: Image: Calibration Check: R.F. Type: Manual and Curve Initial Calibration: Image: Calibration Retention Update% 50 Use GOST Calibration Image: Calibration RF Unknown peaks: C Abs. Rel. Retention Window Update: 1. Calibration Download Calibration Curve with method: Download Calibration Curve with method: Image: Calibration Curve with method: Image: Calibration Curve with method:	T
Calibration Results Nitrogen Methane CO2 Ethane 0,5 0 0 10,000 20,000 Area Changelist Scale Fulls Scale Fulls Scale Fulls Scale Scale Fulls Scale Scale Fulls Scale Fulls Scale Fulls Scale Fulls Scale Fulls Scale Scale Fulls Fulls Fu	
Sample Level 1 Area (Amount)	
1 49513,811069 (3,996900)	



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 calibration 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.

R	RGC 3000 - #60600227-EnCal 3000: Ready											
File	View	Method	Application	Automation	Control	Report	Window	Help				
	2	9	2: CP-4900	Column Mod	- 🔢	- 1	<i></i> 🖉	🔏 💣		3		
	Instru	iment Sl	tatus									
ſ		Inst	trument			Enhand	ced					



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.

											$\boldsymbol{\frown}$	\mathbf{i}							\square	N
5	Pea	k Ider	tification / Calibrati	on: Chan	nel 1															
	# A	Active	Peak Name	ID	Ret.Time	Rel.Ret.Window	Abs.Ret.Window	Reference	Selection Mode	Rel.Ret.Peak	Level	11	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8 Rv	· 1
	1	M	Nitrogen	1	5,97086	5	5		0. Nearest		3,996	69	0	0				0	3,9969	-1
	2	\checkmark	Methane	2	7,713597	5	5		0. Nearest		88,89	937	0	0				0	88,8937	
	3	\checkmark	CO2	3	20,02209	5	5		0. Nearest		1,502	26	0	0)		0	1,5026	1
	4	\checkmark	Ethane	4	32,9556	5	5		0. Nearest		4,003	3	0	0	- ×	~	~	0	4,003	L
4													/							Ľ
																				_

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).

	_	~				
Linear coeff.	Qu	\$	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.

ľ	Reak Identification / Calibration: Channel 1											
	#	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	\checkmark	0	0	13635,3069538877	0		1	5	5	
	3	0. Linear	\checkmark	0	0	19479,2024882378	0		1	5	5	
	4	0. Linear		0	0	20920,0603969714	0		1	5	r i i i	
	_											



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	Sequence												
Sequence Properties					Υ	Verification Pro	operties	Calibration Properties					
Ĺ	Sequence Table				_	Verification Ta	ble	Calibration Table					
		#	Replicates	Calib.Level		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												
ſ	S	equence Proper	ties	Verification Propertie	25	Calibration Properties						
\square	S	equence Table	<u> </u>	Verification Table	C.	alibration Table						
	#	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.


Calibration Properties allows defining the following parameters:

Sequence Table Verification Table Calibration Table Sequence Properties Verification Properties Calibration Properties Activate Calibration Table on the following events: Image: Calibration Table on the following events: Image: Calibration Table on the following events: Image: On Sequence Startup When sequence is running Image: Calibration Table on the following events: Image: On Runs Performed [runs]: 2
Sequence Properties Calibration Properties Activate Calibration Table on the following events: Image: Calibration Table on the following events: Image: On Sequence Startup When sequence is running Image: On Runs Performed [runs]: 2
Activate Calibration Table on the following events: C On Sequence Startup When sequence is running O On Runs Performed [runs]: 2
On Time Elapsed [hours]: 1 On Fixed Time: Hour: 8 Minute: 30 Once Every n days: 1 On Verification Failure

- 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
6
Activate Calibration Table on the following events:
🗖 On Sequence Startup
When sequence is running
C On Runs Performed (runs): 0
O On Time Elapsed (hours):
On Fixed Time: Hour: OMinute: OMinute:
C None
On Verification Failure



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

It looks like this:

🖥 Site Info		
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	<u> </u>	
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:



#	Active	Peak Name	ID	Dectime	Rel.Ret.Window	Abs.Ret.Window	Reference	Selection Mode	Rel.Ret.Peak	Level 1	Level 2	Lev
1		Nitrogen	1	7.132815	5	5		0. Nearest		11.0037	0	0
2		Methane	2	9.397362	5	5		0. Nearest		86.011	0	0
3	M	CO2	3	23.26828	5	5		0. Nearest		1.552	0	0
4	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	l Report Window Help						
0 🛩 🖬	🞒 1: CP-4900 Column	Mod 💌 🔡 🛃 🚭	🚈 💿 🚵 🖉 🖻 🗆 🖻	5 3					
	1: CP-4900 Column 2: CP-4900 Column	Mod 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
Vethod	Cancel
Application	
Sequence	
Site Information	→
Modbus Settings	1005





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.

ill P	RGC 3	000 - #	60700235	EnCal 300	0: Read	у			
File	View	Method	Application	Automation	Control	Report	Window	Help	
		Normalize Calorific F	Power	•	7	2	8		
			Verificatio	on Check					
			Alarms						
			I Imed Re	lays Iouto					
			Digital Inp	outs					

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

		Verification Settings Verification Table			
#	Active	Param Type	Parameter	Minimum	Maximum
1	~	2. Normalized Amounts	1. Nitrogen (Chan 1)	10.8	11.2
2		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	M	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		6. ISO 6976 Results	8. Rel. Density	0.6285	0.6295

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

Y		
vermication Settings	Venication 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):	ving events:	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).

P	🔀 Sequence										
ſ		Sequence Prop	erties	Verification	n Properties	Calibration Properties					
Ĺ		Sequence Table	•	Verificatio	n Table	Calibration Table					
		1									
	#	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:

ł	Alaı	ms									
ſ	Alarm Settings			Alarm Settings Alarm Table							
	#	Active	Param Type	Parameter	Minimum	Maximum	Alarm On	Invert Alarm	Relay Alarm	Relay #	Invert Relay
	1	\mathbf{i}	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		2. Normalized Amounts	18. Methylcyclohexane (chan 2)	0	0,3	5. All			0. None	
	22	\checkmark	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!



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:	: Ready	/		
File View Method Application	Automation	Control	Report	Window	Help
🗅 📂 🔚 🎒 1: CP-4900 C	Sequence			2	🏭 🖉 🖻 🖻 🔮
	Site Informa	ation			
	Modbus Set	up			
	FTP Service				
	Real Time C	lock			
	Reprocess L	list			

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	
○ MODICON	/ DANIEL / ENRON / 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
NT32 bit Type Conversion	Serial Transmission Mode
Normal O Reverse	○ RTU
Shift Modbus Addresses	
⊙ No C 1 up C 1 down	



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

1	RGC 3	000 - #	60700235	EnCal 300	0: Read	у		
File	View	Method	Application	Automation	Control	Report	Window	Help
D	2	6	1: CP-4900 C	olumn Mod 📘	- 🔡	2	2	

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

Select first the connected unit, then Configure under Control

	RGC 30	00 (Admir	n)			8	
File	Control	Help					
D	Oper Oper	n n as Read or	nly				
	Oper	n Offline			Control	EnCal 200	0
	Conf	igure	<u> </u>			EliCargoo	Ŭ.
	Rem	ove from Co	ntrol				
	1						
	6070023	5 1	(Virtual)			Course .	
	EnCal 3(Off)00 E	EnCal 3000 Off				
	011						
				Co	nfigured Instruments		
#	Seria	al	Title		Connection	ole	tor
1	1 (Vir	tual)	EnCal 3000	10	127.0.0.1	Eis	le
2	6070	0235	EnCal 3000	10	10.49.124.232	Instrom	net
						© Agilent Technolo	gies, 2012
						Elster Instrom	et
Clic	k right mou	ise button o	n an instrument	nts icon to perform instrum	nent 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	



Select tab sheet Automation in the configuration screen.

🦀 EnCal 3000 Configuration (Admin) 🖉 🔳 🗖 🔀
Ethernet Communication Setup
Calibrate gressure sensors
IP Address: 10 16 1 91
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: Control of Streams: 8 Digital Inputs: 3 3 Digital Inputs: 3 3 Image: Control of Stream Selection requests from a host system Image: Control of Stream Selection requests from a host system Image: Control of Stream Selection requests from a host system
Analog Inputs: 2 6 Serial Ports: Modbus Serial Comm. Comport VICI: Not used Serial Comm. LCD Display: Not connected Databits: Common Serial Comm.
Extension board detection: Nodbus: Comport 1 Stopbits: 1 Board#: 0 Modbus Redundant: Comport 2 Parity: None Address: 1 Next
Show I/O Configuration miscellaneous: 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.	(Channel	Peak#
15 🗹	2. Holding Register (RW)	7009	3. Float	2401. Appl.: Stream Component Norm%(Double, CHAN=stream, PEAK)	l. 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)		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 💌 <u> 2 49 4</u>	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.

60																	_ C 🗵
#	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	002	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

#	Channe	el 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 0	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	12	11	n-Hexane	0,050400	44,71	0,0000	4411,3769	208259,2481	1,1940	BB	ō	42,39	47,25	1,0120	1,14250E-5
12	2 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	3 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	1 2	14	2	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.

🚮 Ap	pplicatio	on Report									X
SAM	PLE		ENERGY	r		ENVIRON	MENT		∏ Hide	e non Appl.pks	
Samp	ling Time	20/09/2012 17:29:58	Calc.Meth	iod I	SO 6976	Sampling Ar	nalog #1 0,000	00	□ Hide	anored Appl.pks	
Run N	Number	26	Compressi	ibility 1	,00000,	Sampling Analog #2		00			
Run T	Гуре	Analysis	Molar Mas	is 1	8,07313	Cabinet Ter	nperature 37				
Calibr	ation Leve	el O	Molar Mass Ratio),62402	Ambient Pre	essure 100				
Stream # 1		Rel.Density),62365	Digital in #1	0					
Sum B	Sum ESTD 100,0005		Abs.Densi	ity (),80633	Digital in #2	0				
Sum B	Sum Estimates 0,0000		Hs	1	1,14188	Digital in #3	0				
Sum A	Areas	1159054,9674	Hi	1	0,06183						
Total	Peaks	26	Wobbe St	ир. 1	4,10876	SITE INFO	נ				
ls Sta	rtup Run	False	Wobbe In	f. 1	2,74110	Customer ID)				
Unkn	own Peak	s 3				Instrument I	Name EnCa	13000			
Curren	nt Stream :	# 7				Serial Numb	er 6070	0235			
						Tag Numbe	r				
						Cylinder 1 T	ag				
	Channel	Paaknama	ESTD Cono	Norm Cono	Retention [a]	Area	Haiaht	Mathunday	Grouptt	DC	
1	1	Nitrogen	3 996900	3 996878	5.97	49513.8111	5463670 7454	1	n	8.072293E-05	
2	1	Methane	88 893700	88 893212	7.71	925697 8401	57944446 1729	2	0	9.6028855-05	-
3	1	CD2	1 502600	1 502592	20.03	22143 2796	664857 6117	3	0	6 785806E-05	-
4	1	Ethane	4.003000	4 002978	32.97	63530,6756	1214006 2800	4	0	6 300893E-05	-
5	2	Propage	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	1
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	
23	2	COS	0,000000	0,000000	0,00	0,0000	0,0000	23	0	0	1
24	2	Oxygen	0,000000	0,000000	0,00	0,0000	0,0000	24	0	0	
25	2	Hydrogen	0,000000	0,000000	0,00	0,0000	0,0000	25	0	0	
26	2	Helium	0,000000	0,000000	0,00	0,0000	0,0000	26	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

Sampling Time 20 Run Number 26 Run Type Ar Calibration Level 0 Stream Number 1 Sum ESTD 10 Sum Estimates 0, Sum Areas 11 Total Peaks 26 Is Startup Run Fa Unknown Peaks 3 Current Stream # 7		20/9/2012 1 26 Analysis 1 0 100,0005 0,0000 1159054,96 26 False 3 # 7	7:29:58 74		ENERGY Calc.Method Compressibili Molar Mass Molar Mass R Rel.Density Abs.Density Hs Hi Wobbe Sup. Wobbe Inf.	ISC ty 1,0 18, 18, 0,6 0,8 11, 10, 14, 12,	0 6976 0000 07313 2402 2365 0633 14188 06183 10876 74110		ENVIRONMENT Sampling Analog #1 Sampling Analog #2 Cabinet Temperature Cabinet Temperature Digital in #1 Digital in #2 Digital in #3 SITE INFO Customer ID Instrument Name Serial Number Tag Number Cvlinder 1 Tag	0,0000 0,0000 37 100 0 0 0 EnCal 3000 60700235
#	Channel	Deakname	ESTD Conc	Norm Conc	Retention [s]	Δrea	Height	RF	Cymruch i rug	
1	1	Nitrogen	3.996900	3.996878	5.97	49513.8111	5463670,7454	8.072293E-05		
2	1	Methane	88,893700	88,893212	7,71	925697,8401	57944446,1729	9,602885E-05		
3	1	CO2	1,502600	1,502592	20,03	22143,2796	664857,6117	6,785806E-05		
4	1	Ethane	4,003000	4,002978	32,97	63530,6756	1214006,2800	6,300893E-05		
5	2	Propane	1,001600	1,001595	12,38	55851,5291	6701271,7125	1,793326E-05		
6	2	i-Butane	0,200800	0,200799	14,62	13161,2786	1395326,3027	1,525688E-05		
7	2	n-Butane	0,201000	0,200999	16,36	13933,4059	1384374,0881	1,442576E-05		
8	2	neo-Pentane	0,050000	0,050000	17,25	3166,9130	304598,5274	1,578825E-05		
9	2	I-Pentane	0,049900	0,049900	22,29	3752,4623	278968,5323	1,329793E-05		
10	2	n-Pentane	0,050100	0,050100	25,15	3844,3802	282499,0003	1,303201E-05		
11	2	n-Hexane	0,050949	0,050948	44,71	4411,3709	208259,2481	1,1425E-05		
12	2	n-Heptane	0,000000	0,000000	0,00	0,0000	0,0000	0		
14	2	n Nonano	0,000000	0,000000	0,00	0,0000	0,0000	0		
15	2	n-Decane	0,000000	0,000000	0,00	0,0000	0,0000	0		
16	2	Bonzono	0,000000	0,000000	0,00	0,0000	0,0000	0		
17	2	Cyclohevane	0,000000	0,000000	0,00	0,0000	0,0000	ő		
18	2	Methylcyclohexane	0,000000	0,000000	0,00	0,0000	0,0000	ő		
19	2	Toluene	0,000000	0,000000	0,00	0,0000	0,0000	ŏ		
20	2	n-Undecane	0,000000	0,000000	0,00	0,0000	0,0000	õ		
21	2	n-Dodecane	0,000000	0,000000	0,00	0,0000	0,0000	ō		
22	2	H2S	0.000000	0,000000	0.00	0,0000	0.0000	0		
23	2	COS	0,000000	0,000000	0,00	0,0000	0,0000	0		
24	2	Oxygen	0,000000	0,000000	0,00	0,0000	0,0000	0		
25	2	Hydrogen	0,000000	0,000000	0,00	0,0000	0,0000	0		
26	2	Helium	0.000000	0.000000	0.00	0.0000	0.0000	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.

File Control Help	
Control	
60700235 EnCal 3000 Off	EnCal 3000
Configured Instruments # Serial Title Connection 1 60700235 EnCal 3000 10.49.124.232	elster
Click right nouse button on an instruments icon to perform instrument operations	© Agilent Technologies, 2012 Elster Instromet

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:

insaumen		Enhanced							
Automation:									
State: Idle	e		Run II) #:	0				
Sample type: An	alysis		Seque	ence line #:	0				
Sample stream #: 0	0		Line r	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'							
GC channel:	Chan	nel 1	Chan	nel 2		Chan	nel 3	Chan	nel 4
	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	00.0					353072		
Column temp. [°C]: Injector temp. [°C]: Column pressure [kPa	50]: 110	110.3	110	110.8		n/a	n/a	n/a	n/a

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	0500202-En	iCal 3000: Re	ady i		
File	View	Method	Application	Automation	Control	Report	Window Help
		Instrui Integri	ment Setup . ation Events	"] 🔊 🛃	2	
		Peak I Peak C	dentification Calibration				
		Advan	iced				
		Proper	rties				

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

۲P	R Peak Identification / Calibration: Channel 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		Nitrogen	1	5,97086	5	5		0. Nearest		3,9969	0	0		1		0	3,9969 -
2	\checkmark	Methane	2	7,713597	5	5		0. Nearest		88,8937	0	0		N		0	88,8937
3	\checkmark	CO2	3	20,02209	5	5		0. Nearest		1,5026	0	0)		0	1,5026
4	M	Ethane	4	32,9556	5	5		0. Nearest		4,003	0	0	, v	, v	÷	0	4,003
•																	

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	🔡 RGC 3000 - #60500202-EnCal 3000: Connecting								
File Vie	w Method	Application	Automation	Control	Report	Window	Help		
	a 🚑 1: Ci	⊃-4900 Columi	n Mod 💌 📋	2 2 4	2	<u>a</u> 5			
	1: CF 2: CF	-4900 Columr -4900 Columr	n Mod n 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
vate Calibration Table on the following events:		
On Sequence Startup		
hen sequence is running		
On Runs Performed [runs]: 10		
On Fixed Time: Hour: 6 Minute: 0	Once Every n days: 1	
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	• • • • • • • • • • • • • • • • • • • •
	Verification Check	_
	Alarms	
Timed Relays		
	Analog Inputs	
	Digital Inputs	
📥 Alarms		
Alarm Se	ttings	Alarm Table
Alarming parame	ters	
🔽 Alarm table e	nabled	

		Alarm Settings		Alarm Table					1
#	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	1		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	M	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		» 💿 🌆 🗖 🖻	
	Site Inform	ation		
	Modbus Se	etup		
	FTP Servic	e		
	Real Time Clock			
	Reprocess	List		

The following dialog box appears

	Sequence		
l	Sequence Table	Verification Table	Calibration Table
ĺ	Sequence Properties	Verification Properties	Calibration Properties

Select tab sheet Sequence Table:

ſ	S	equence Properties	Verifi	cation Properties	Ca	alibration Properties
ſ	Se	quence Table	Verifi	cation Table) Ca	alibration Table
	# Sample Type R		Replicates	Calib.Level	Stream #	Flush time (s) 📥
	1	1. Analysis	1	1	1	150
	2 1. Analysis 2		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**:

🔡 RGC 3000 - #60700235-EnCal 3000: Ready						
File	View	Method Application Autor	mation Control Report Window Help			
	2 🖬	Instrument Setup	1od 🔽 🛃 🛃 🔎 🚳 🖓 🖃 🗆 🗟 🦿			
		Deals Telestices and	-			
		Peak Identification Peak Calibration				
		Advanced	-			
		Havancoa	-			
		Properties				

🍓 Method Advanced Set	tings		
Export to file	port to MLink32)	
Export Results settings =			
🔽 Export enabled			
Export parameters availabl Height Unnorm. concentration Response Factors		Selected: Retention Area Normalized conc. Energy Meter Ambient Temp., Pres.	

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.

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