GE Healthcare
Life Sciences

UNICORN™ 5.31

Administration and Technical Manual

Table of Contents

1 Network setup 5
1.1 Network terms and concepts 6
1.2 Network environment 8
1.3 UNICORN network example 10
1.4 How to configure the workstations 11
1.4.1 How to configure Windows XP workstations 12
1.4.2 How to configure Windows 7 workstations 18

2 Installation 32
2.1 Installation overview 33
2.2 Hardware installation 34
2.2.1 When to install hardware 35
2.2.2 How to install CU-950 36
2.2.3 How to install CU-960 38
2.3 Software Installation 40
2.3.1 Preparations before installing UNICORN 5.31 on Windows 7 41
2.3.2 How to install UNICORN 44
2.3.3 How to install UNICORN for ÄKTAxpress 64
2.3.4 Upgrade a previous UNICORN 5.x installation to UNICORN 5.31 80
2.3.5 Define a system after UNICORN 5.31 is installed 84
2.3.6 Windows 7 post-installation settings 92

3 System connections 99
3.1 System connection facts 100
3.2 How to connect a system 101
3.3 Connection modes 103
3.4 How to leave and lock a system 105
3.5 How to disconnect a system 107

4 Calibration 109
4.1 Calibration facts 110
4.2 How to calibrate monitors for ÄKTAdesign systems 112

5 Security 115
5.1 Access security 116
5.2 Connection security 117
5.3 Data security 118
5.3.1 Network communication failure - remote station 119
5.3.2 Network communication failure - local station 121
5.3.3 Local station failure 122
5.4 How to prevent accidental shut-down 124
5.5 The Options dialog box 125

6 Administration 131

6.1 Administration overview 132
6.2 System administration 134
6.2.1 System definitions 135
6.2.2 Audit trails 146
6.2.3 How to back up and restore system definitions 157
6.3 User Administration 161
6.3.1 User access groups 162
6.3.2 Access items 166
6.3.3 How to create a new user 169
6.3.4 How to assign user properties 175
6.3.5 How to change user passwords and user attributes 184
6.3.6 How to delete users and folders 188

7 System settings 191

7.1 The Instructions dialog box 192
7.2 Alarms settings 194
7.3 Specials settings 197
7.4 Monitors settings 198
7.5 Curves settings 199
7.6 CU-950/CU-960 settings 200

8 Troubleshooting 202

8.1 Advice on operation: Logon 203
8.2 Advice on operation: UNICORN access 206
8.3 Advice on operation: Methods 209
8.4 Advice on operation: Evaluation 213
8.5 Advice on operation: ÄKTAdesign systems 214
8.6 Advice on operation: CU-950/CU-960 215

A Technical specifications 218

A.1 System recommendations 219
A.2 UNICORN control capacity 221
A.3 Data sampling 222

Index 224

1 Network setup

Introduction

With UNICORN installed in a network environment, chromatography systems can be controlled from any PC in the network which has the UNICORN software installed. This chapter describes how to set up the network environment of a UNICORN network.

In this chapter

This chapter contains these sections.

Section	See page
1.1 Network terms and concepts	6
1.2 Network environment	8
1.3 UNICORN network example	10
1.4 How to configure the workstations	11

1.1 Network terms and concepts

Introduction

In this section, some important network terms and concepts are explained.

Administrator categories and duties

The administrator duties can be divided into two categories with different responsibilities:

- Network administrator: Responsible for network setup, software installation and software maintenance.
- UNICORN administrator (or system administrator): Responsible for the use of UNICORN to control chromatography systems.

The network administrator and the UNICORN administrator can be the same person, but the tasks can also be carried out by two different persons.

Administrator security responsibilities

The different security responsibilities of the network administrator and the UNICORN (system) administrator are listed below.

Area	Network administrator responsibilities	UNICORN administrator responsibilities
Data storage security (back-up routines)	Back-up routines for server and local disks.	Control user access to home and shared folders, for example to place all home folders on a shared disk to prevent data from being scattered through the network.
Network access security	Maintenance of user passwords and access rights to shared resources.	-
UNICORN security	-	Maintenance of user profiles.

Local and remote stations

In a UNICORN network, the workstations can be categorized as either local stations or remote stations.

Workstation type	Description
Local station	A PC to which a chromatography system is physically connected.
Remote station	A PC to which no chromatography system is physically connected but which can control systems over a network link.

Network terms

In the table below are explanations for some terms which are important to understand when working with UNICORN in a network.

Term	Explanation
Storage of data	Methods and log files are stored in a folder shared between the local and the remote UNICORN.
Communication	The local and the remote UNICORN use either named pipes or sockets to send commands and data between them.
Named pipes communication	From the remote UNICORN, commands are sent, e.g. "run method foo.met". From the local UNICORN, messages and trend data are sent to the remote UNICORN.
Network failure in the middle of a run	The local UNICORN will continue the run and store log file on the *local* hard drive when the run is over.
Access to the network drive while running	When a method is started it is copied from the network drive to a local directory. During the run the method is read from the local directory.
Server in a UNICORN network setup	UNICORN requires a directory for log files and method templates to be accessible by both the local and the remote UNICORN. It is generally a good idea to use a directory on a Windows™ server for easy backup.

1.2 Network environment

Who can perform the network setup?

The network setup should be performed by someone with experience in Windows XP/Windows 7 and network installations. Preferably, a competent network administrator should be involved in the network setup, the installation of the UNICORN software and the maintenance of the network.

Reference: Network recommendations are listed in *Section A.1 System recommendations, on page 219*

UNICORN versions

All computers in the UNICORN network must have the same version of the UNICORN software installed, both the computers directly connected to chromatography systems and the remote control computers.

Operating systems

UNICORN 5.31 is compatible with

- Windows XP Professional US (32-bit)
- Windows 7 Professional US (32-bit and 64-bit versions)

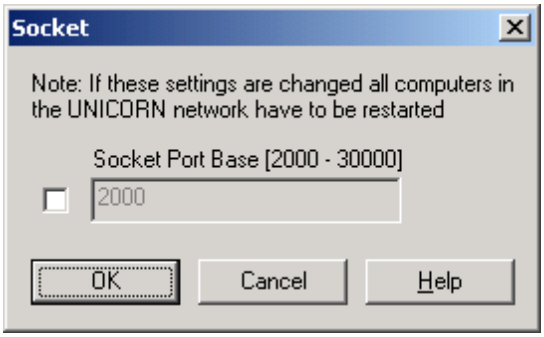
Windows user right

The user must have the Windows user right ***Access this computer from network*** to connect to the local station in remote control.

If named pipes cannot be used

In some networks, the policy is to not allow named pipes. In such a case TCP/IP communication via sockets must be used.

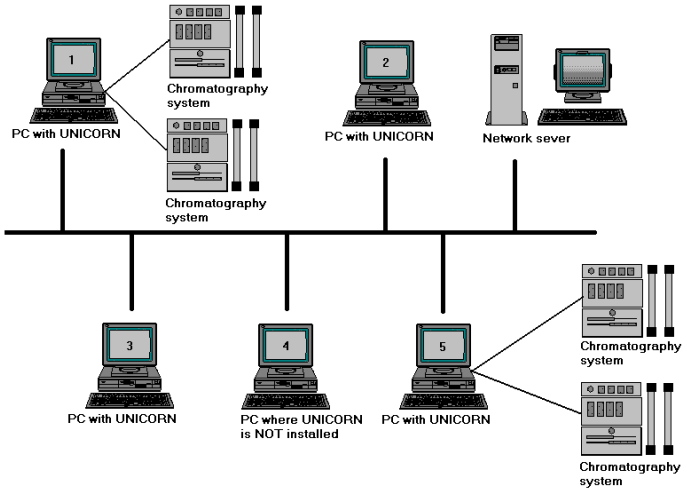
Follow the instructions in the table below to enable sockets and disable named pipes:

Step	Action
1	Choose ***Administration:System Setup...*** in the ***UNICORN Manager***. *Result*: The ***System Setup*** dialog is displayed.
2	Click the ***Socket*** button in the ***System Setup*** dialog. *Result*: The ***Socket*** dialog is displayed.
3	• Check the check box in the ***Socket*** dialog.  • Click ***OK***. • Click ***Close***.

1.3 UNICORN network example

Network illustration

The figure below illustrates how a UNICORN network can be organized:



Comments to the illustration

Below are some comments to the network illustration shown in the figure above.

- PCs 1 and 5 are *local stations*: they have UNICORN installed and are directly connected to chromatography systems. To have a chromatography system accessible remotely, the local station must be switched on and logged on to the network.
- PCs 2 and 3 are *remote stations*: they have UNICORN installed but are not directly connected to chromatography systems. Via the network, the remote stations can control the chromatography systems that are connected to the local stations.
- PC 4 does not have UNICORN installed and therefore cannot control any chromatography systems although it is connected to the network.
- The network server does not have UNICORN installed and is not involved in the chromatography control process as such.

1.4 How to configure the workstations

Introduction

This section describes how to configure the workstations in the UNICORN network depending on the operating system installed on the workstations.

In this section

This section contains these topics.

Section	See page
1.4.1 How to configure Windows XP workstations	12
1.4.2 How to configure Windows 7 workstations	18

1.4.1 How to configure Windows XP workstations

Introduction

This subsection describes how to configure Windows XP workstations in a UNICORN network with a Windows server and TCP/IP network protocol.

User rights

All users must have the Windows user right ***Access this computer from the network***, which is also the default user right. If the user right is not correct the network administrator can change it.

How to set the correct user right

Follow the instructions in the table below to set the user right to ***Access this computer from the network***.

Step	Action
1	Log on to the workstation with administrative rights.
2	Choose ***Start:Control Panel:Administrative Tools:Local Security Policy***. **Note:** If you cannot see the individual items in the Control Panel you have to click the link ***Switch to Classic View*** in the left pane of the Control Panel.
3	Choose ***Security Settings:Local Policies:User Rights Assignment*** in the tree structure.
4	Double-click the ***Access this computer from the network*** option.

Step	Action
5	Click the ***Add User or Group*** button. *Result:* The ***Select Users or Groups*** dialog box is opened.

Make sure the correct domain is displayed in the text field ***From this location***.

Click the button

- ***Object Types...*** to change the type of objects to select
- ***Locations...*** to change the root location (domain) from which to begin your search.

6 Choose one of the following options:

Option 1: Write the name

1 Write the name of the group or user(s) in the text field ***Enter the object names to select (examples)***.

2 Click the ***Check Names*** button to check if the name is valid.

3 If the name is accepted, click ***OK*** and then ***OK*** again.

Option 2: Choose the name from a list

1 Click the ***Advanced...*** button. An expanded ***Select Users or Groups*** dialog box is opened.

2 Click the ***Find Now*** button to display a list of possible names.

3 Select one or more names and click ***OK***.

4 Click ***OK*** and then ***OK*** again.

Network components to install

In order to connect a Windows XP workstation to the network, the following network components need to be installed on the workstation:

- Client for Microsoft™ Networks
- File and Printer Sharing for Microsoft Networks
- TCP/IP Protocol
- A valid network card

How to install network components

Follow the instructions below to install the necessary network components.

Step	Action
1	• Start the computer with the appropriate network card inserted. • Log on to the Windows XP workstation with administrator rights. The adapter will be found and installed.
2	Choose ***Start:Control Panel:Network Connections***. *Result:* The ***Network Connections*** window is opened.
3	Right-click the ***Local Area Connection*** icon and choose ***Properties***. *Result:* The ***Local Area Connection Properties*** dialog box is opened and the ***General*** tab is displayed.
4	If the component ***Client for Microsoft Networks*** is already installed, go to step 5. Otherwise, • Click the ***Install*** button, select the component ***Client*** from the list and click the ***Add...*** button. • Select ***Client for Microsoft Networks*** from the list and click ***OK***.

Step	Action
5	If the component ***File and Printer Sharing for Microsoft Networks*** is already installed, go to step 6. Otherwise, • Click the ***Install*** button, select the component ***Service*** from the list and click the ***Add...*** button. • Select ***File and Printer Sharing for Microsoft Networks*** from the list and click ***OK***.
6	If the component ***Internet Protocol (TCP/IP)*** is already installed, go to step 7. Otherwise, • Click the ***Install*** button, select the component ***Protocol*** from the list and click the ***Add...*** button. • Select ***Internet Protocol (TCP/IP)*** from the list and click ***OK***.
7	• In the ***Local Area Connection Properties*** dialog box, select ***Internet Protocol (TCP/IP)*** and click ***Properties***. • Configure the TCP/IP protocol with network-specific information.

How to connect the workstation to the domain

Follow the instructions in the table below to add the workstation to the Windows domain.

Step	Action
1	Log on to the Windows XP workstation with administrator rights.
2	Choose ***Start***:***Control Panel***:***System***. *Result:* The System Properties dialog is displayed.
3	Choose the ***Computer Name*** tab and click the ***Change...*** button. *Result*: The ***Computer Change Names*** dialog is opened.
4	• Select the ***Domain*** radio button and write the domain name in the text field. • Click ***OK***.

Step	Action
5	• Type ***User name*** and ***Password*** in the subsequent dialog and click ***OK***. • Click ***OK*** in the ***Domain Welcome*** dialog
6	A dialog is displayed which informs that the computer should be restarted for the changes to take effect. Click ***OK*** in the dialog and restart the computer.

To map a drive letter and install UNICORN

The last steps in the network setup are

- to map the shared folder to a drive letter
- to install the UNICORN software.

See the instructions below.

How to map the shared folder

Follow the instructions in the table below to map the shared folder to a suitable drive letter.

Step	Action
1	Log on to the Windows XP workstation with domain user rights. This user must also be a member of the user group created before.
2	Open ***Windows Explorer***.
3	Select ***Tools:Map Network Drive*** to connect the shared folder on the UNICORN file server to the designated drive letter:
4	• Select the drive letter in the upper drop-down list box. • Make sure the ***Reconnect at Logon*** option is selected. • Click the ***Browse*** button.
5	• Locate and select the shared folder UNICORN will use and click ***OK***. • Click the ***Finish*** button.

How to install UNICORN on a workstation

Follow the instructions in the table below to install UNICORN.

Step	Action
1	Install UNICORN. See *Section 2.3.2 How to install UNICORN, on page 44* (select the ***Network installation*** option) or *Section 2.3.3 How to install UNICORN for ÄKTAxpress, on page 64*.
2	Reboot the PC and log on as one of the domain users that will run UNICORN.
3	Connect the shared folder again. This is necessary since connected network drives are user-specific.
4	Open ***Windows Explorer***.
5	Select ***Tools:Map Network Drive*** to connect the shared folder on the UNICORN file server to the designated drive letter:
6	• Select the drive letter in the upper drop-down list box. • Make sure the ***Reconnect at Logon*** option is selected. • Click the ***Browse*** button.
7	• Locate and select the shared folder UNICORN will use and click ***OK***. • Click the ***Finish*** button.
8	Start UNICORN and set up • the system definitions, see *Section 6.2.1 System definitions, on page 135*. • the user profiles, see *Section 6.3 User Administration, on page 161*.

1.4.2 How to configure Windows 7 workstations

Introduction

This subsection describes how to configure Windows 7 workstations in a UNICORN network with a Windows server and TCP/IP network protocol.

User rights

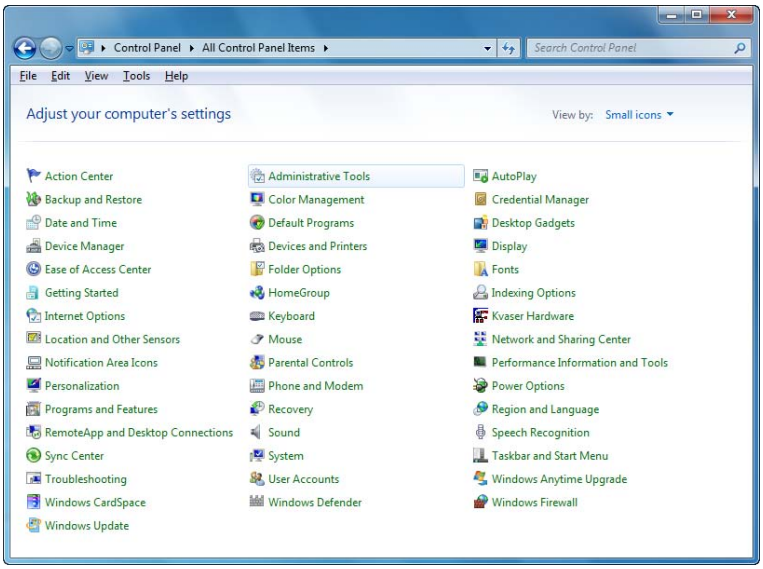
All users must have the Windows user right ***Access this computer from the network***, which is also the default user right. If the user right is not correct the network administrator can change it.

How to set the correct user right

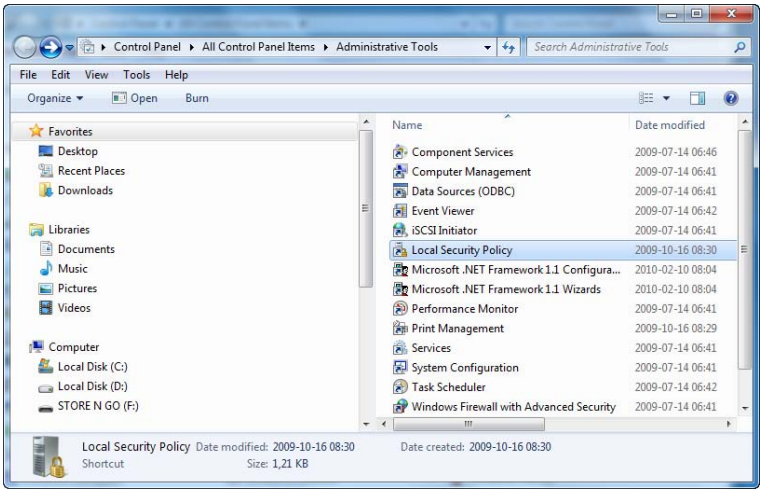
Follow the instructions in the table below to set the user right to ***Access this computer from the network***.

Step	Action
1	Log on to the workstation with administrative rights.

Step	Action
2	Choose ***Start:Control Panel***. **Note:** If you cannot see the individual items in the Control Panel you have to choose ***View by: Small icons*** in the top right part of the Control Panel.

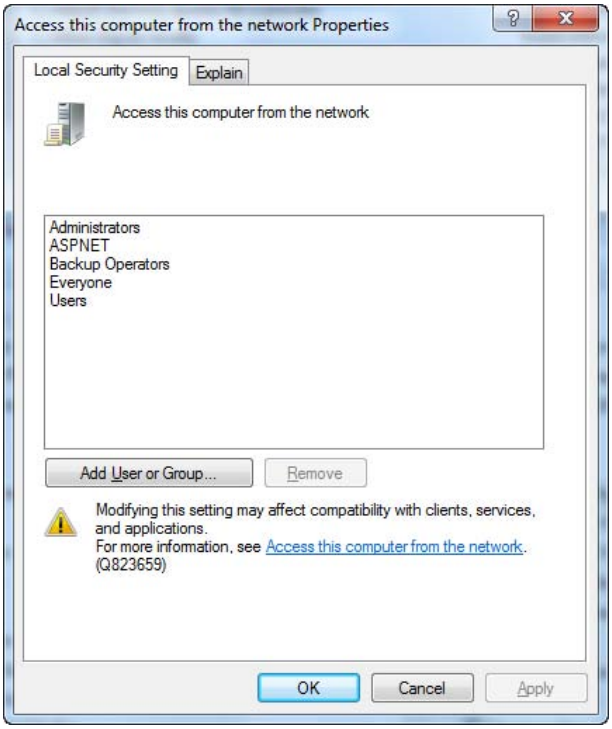


Step	Action
3	Double-click the ***Administrative Tools*** icon. *Result:* The ***Administrative Tools*** dialog opens.



4	Double-click the ***Local Security Policy*** item. *Result:* The ***Local Security Policy*** dialog opens.

Step	Action
5	• Click the arrow symbol by the ***Local Policies*** folder, • select the ***User Rights Assignment*** folder and • double-click the ***Access this computer from the network*** Policy item. *Result:* The ***Access this computer from the network Properties*** dialog opens.



6	Click the ***Add User or Group*** button. *Result:* The ***Select Users or Groups*** dialog box is opened. Make sure the correct domain is displayed in the text field ***From this location***. Click the button • ***Object Types...*** to change the type of objects to select • ***Locations...*** to change the root location (domain) from which to begin your search.

Step	Action
7	Choose one of the following options: **Option 1: Write the name** 1 Write the name of the group or user(s) in the text field ***Enter the object names to select (examples)***. 2 Click the ***Check Names*** button to check if the name is valid. 3 If the name is accepted, click ***OK*** and then ***OK*** again. **Option 2: Choose the name from a list** 1 Click the ***Advanced...*** button. An expanded ***Select Users or Groups*** dialog box is opened. 2 Click the ***Find Now*** button to display a list of possible names. 3 Select one or more names and click ***OK***. 4 Click ***OK*** and then ***OK*** again.

Network components to install

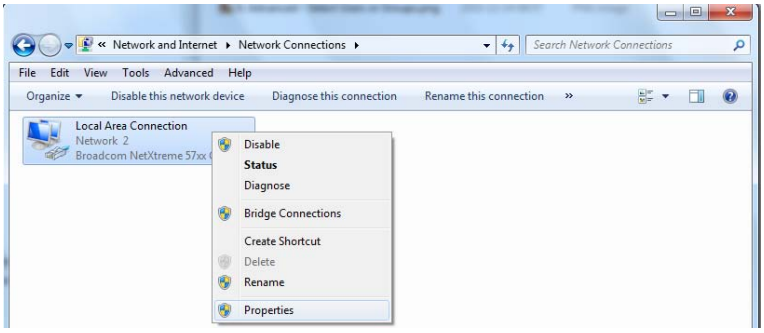
In order to connect a Windows 7 workstation to the network, the following network components need to be installed on the workstation:

- Client for Microsoft Networks
- QoS Packet Scheduler
- File and Printer Sharing for Microsoft Networks
- TCP/IP Protocol Version 4 (TCP/IPv4)
- Link-Layer Topology Discovery Mapper I/O Driver
- Link-Layer Topology Discovery Responder
- A valid network card

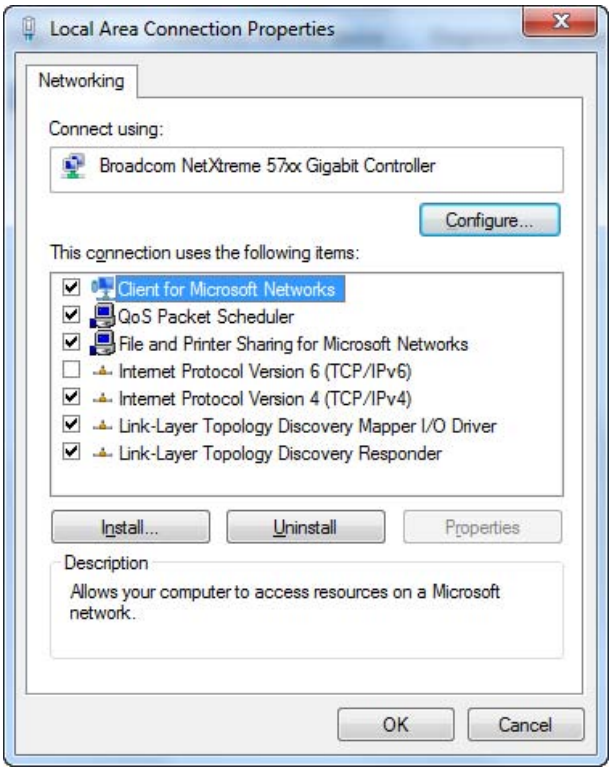
How to install network components

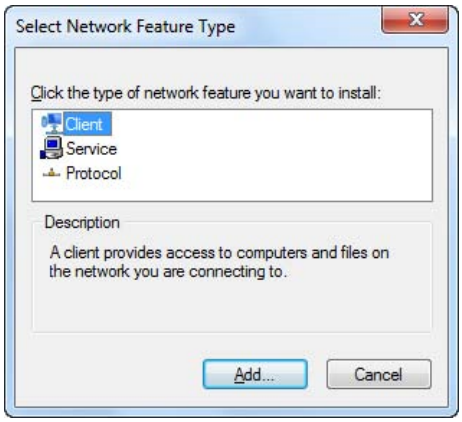
Follow the instructions below to install the necessary network components.

Step	Action
1	• Start the computer with the appropriate network card inserted. • Log on to the Windows 7 workstation with administrator rights. The adapter will be found and installed.
2	Choose ***Start:Control Panel:Network and Sharing Center***. *Result:* The ***Network and Sharing Center*** dialog is opened.
3	Click the ***Change adapter settings*** menu item. *Result:* The ***Network Connections*** dialog is opened.



Step	Action
4	Right-click the network card object and choose the ***Status*** menu item. *Result:* The ***Local Area Connection Properties*** dialog is opened.



Step	Action
5	If the component ***Client for Microsoft Networks*** is already installed, proceed with the next step. Otherwise, • Click the ***Install*** button, select the component ***Client*** from the list and click the ***Add...*** button.  • Select ***Client for Microsoft Networks*** from the list and click ***OK***. **Note:** If the list is empty, you may have to insert your installation CD and click the ***Have Disk*** button to install the protocol from the CD.
6	If the component ***QoS Packet Scheduler*** is already installed, proceed with the next step. Otherwise, • Click the ***Install*** button, select the component ***Service*** from the list and click the ***Add...*** button. • Select ***QoS Packet Scheduler*** from the list and click ***OK***.
7	If the component ***File and Printer Sharing for Microsoft Networks*** is already installed, proceed with the next step. Otherwise, • Click the ***Install*** button, select the component ***Service*** from the list and click the ***Add...*** button. • Select ***File and Printer Sharing for Microsoft Networks*** from the list and click ***OK***.

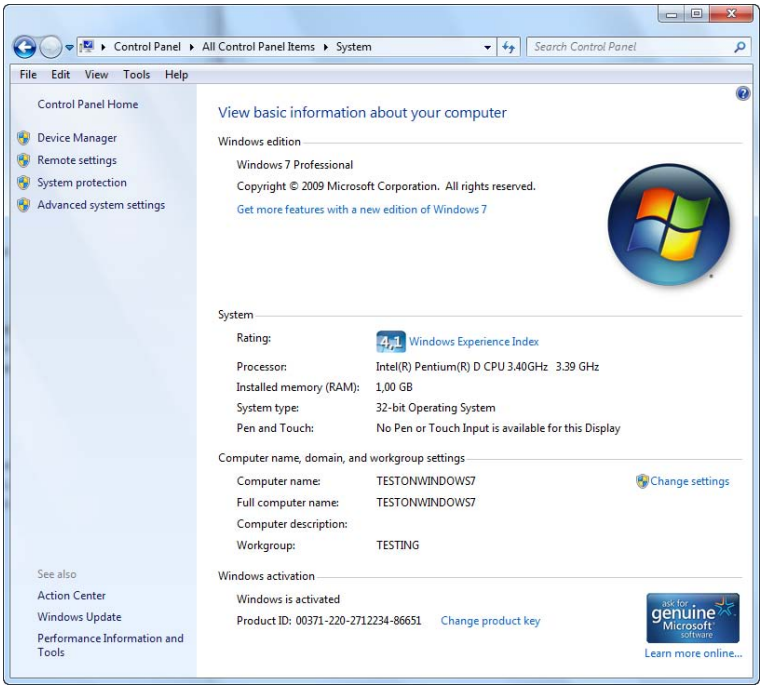
Step	Action
8	If the component ***Internet Protocol Version 4 (TCP/IPv4)*** is already installed, proceed with the next step. Otherwise, • Click the ***Install*** button, select the component ***Protocol*** from the list and click the ***Add...*** button. • Select ***Internet Protocol Version 4 (TCP/IPv4)*** from the list and click ***OK***.
9	• In the ***Local Area Connection Properties*** dialog box, select ***Internet Protocol Version 4 (TCP/IPv4)*** and click ***Properties***. • Configure the TCP/IP protocol with network-specific information.

How to connect the workstation to the domain

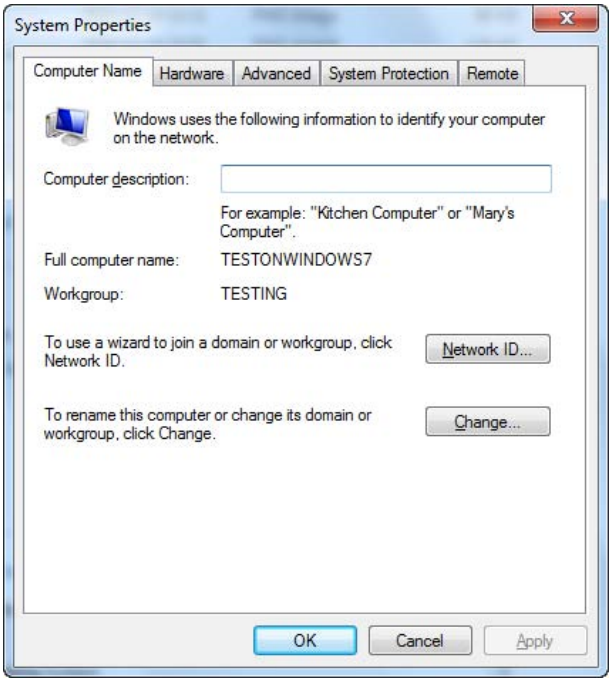
Follow the instructions in the table below to add the workstation to the Windows domain.

Step	Action
1	Log on to the Windows 7 workstation with administrator rights.

Step	Action
2	Choose ***Start:Control Panel:System***. *Result:* The ***System*** dialog is displayed.



Step	Action
3	Click the ***Change settings*** link in the ***Computer name, domain and work-group settings*** field. *Result*: The ***System Properties*** dialog is opened.



4	Click the ***Change*** button. *Result*: The ***Computer Name/Domain Changes*** dialog is opened.

Step	Action
5	• Select the ***Domain*** item in the ***Member of*** field • enter the ***Domain*** address and • click the ***OK*** button. *Result:* The ***Windows Security*** dialog is opened. 
6	• Type ***User name*** and ***Password*** and • click ***OK***.
7	Click ***OK*** in the ***Domain Welcome*** dialog.
8	A dialog is displayed which informs that the computer should be restarted for the changes to take effect. Click ***OK*** in the dialog and restart the computer.

To map a drive letter and install UNICORN

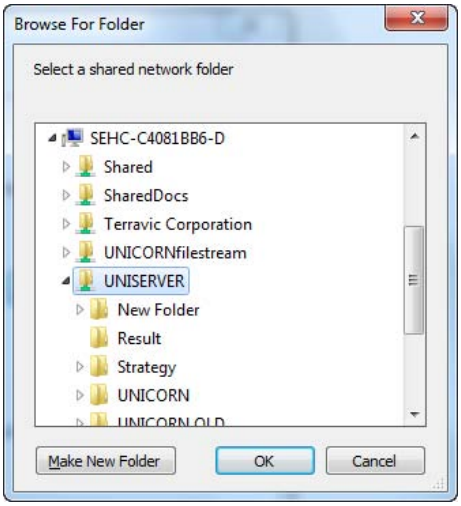
The last steps in the network setup are

- to map the shared folder to a drive letter
- to install the UNICORN software.

See the instructions below.

How to map the shared folder

Follow the instructions in the table below to map the shared folder to a suitable drive letter.

Step	Action
1	Log on to the Windows 7 workstation with domain user rights. This user must also be a member of the user group created before.
2	Choose ***Start:Computer***. *Result:* The ***Computer*** dialog is displayed.
3	Choose the ***Map network drive*** menu item. *Result:* The ***Map Network Drive*** dialog is displayed.
4	• Select the drive letter in the ***Drive*** droplist. • Make sure the ***Reconnect at Logon*** option is selected. • Click the ***Browse*** button. *Result:* The ***Browse For Folder*** dialog is opened. 
5	Locate and select the shared folder UNICORN will use and click ***OK***.
6	Click the ***Finish*** button in the ***Map Network Drive*** dialog.

How to install UNICORN on a workstation

Follow the instructions in the table below to install UNICORN.

Step	Action
1	Install UNICORN. See *Section 2.3.2 How to install UNICORN, on page 44* (select the ***Network installation*** option) or *Section 2.3.3 How to install UNICORN for ÄKTAxpress, on page 64*.
2	Reboot the PC and log on as one of the domain users that will run UNICORN.
3	Configure the Windows 7 power save settings as described in *Section 2.3.6 Windows 7 post-installation settings, on page 92*.
4	Connect the shared folder again. This is necessary since connected network drives are user-specific: Choose ***Start:Computer***. *Result:* The ***Computer*** dialog is displayed.
5	Choose the ***Map network drive*** menu item. *Result:* The ***Map Network Drive*** dialog is displayed.
6	• Select the drive letter in the ***Drive*** droplist. • Make sure the ***Reconnect at Logon*** option is selected. • Click the ***Browse*** button. *Result:* The ***Browse For Folder*** dialog is opened.
7	Locate and select the shared folder UNICORN will use and click ***OK***.
8	Click the ***Finish*** button in the ***Map Network Drive*** dialog.
9	Start UNICORN and set up • the system definitions, see *Section 6.2.1 System definitions, on page 135*. • the user profiles, see *Section 6.3 User Administration, on page 161*.

2 Installation

Introduction

This chapter describes how to install

- hardware (external controller)
- the UNICORN 5.31 software.

It also describes

- system connection management
- system monitor calibration.

In this chapter

This chapter contains these sections:

Section	See page
2.1 Installation overview	33
2.2 Hardware installation	34
2.3 Software Installation	40

2.1 Installation overview

Installation summary

The table below is an overview of the *complete* UNICORN installation procedure.

Step	Action
1	Back up files if you migrate from an older version of UNICORN to a newer version.
2	Set up the network environment (for network installations only) and the workstations. *Reference*: See *Section 1.4 How to configure the workstations, on page 11*.
3	Install UNICORN hardware and software. *Reference*: See *Section 2.2 Hardware installation, on page 34* and *Section 2.3 Software Installation, on page 40*.
4	Define access levels for the installation. *Reference*: See *Section 6.3.1 User access groups, on page 162*.
5	Define users with home folders and access profiles. *Reference*: See *Section 6.3.3 How to create a new user, on page 169* and *Section 6.3.4 How to assign user properties, on page 175*.
6	Check the system settings for the attached systems. *Reference*: See chapter *Chapter 7 System settings, on page 191*.

System recommendations

The hardware, software and network recommendations are listed in *Section A.1 System recommendations, on page 219*.

2.2 Hardware installation

Introduction

The hardware can be of two types:

- External controller: CU-950

  or

- External controller: CU-960

First of all, read *Section 2.2.1 When to install hardware, on page 35* to check if any hardware installation is necessary.

Note: Hardware installation for ÄKTAxpress™ is described in the ÄKTAxpress Installation Guide.

In this section

This section contains these topics:

Section	See page
2.2.1 When to install hardware	35
2.2.2 How to install CU-950	36
2.2.3 How to install CU-960	38

2.2.1 When to install hardware

Pre-installed systems

In most cases your system is pre-installed, that is it is installed by authorized personnel from GE Healthcare. If your system is pre-installed, no hardware installation is necessary.

When hardware installation is necessary

Hardware installation is only necessary for a PC which is directly connected to one or more systems. Whether this PC is connected to a network or not (stand-alone installation) does not matter.

In other words, if your system is not pre-installed and the computer is directly connected to a chromatography system, you must install hardware.

2.2.2 How to install CU-950

When to use CU-950

The CU-950 controller is an interface to connect chromatography or synthesis instruments to a PC. CU-950 can be used together ÄKTA™ instruments *except* ÄKTAprime™, ÄKTAxpress, ÄKTAprocess™ and ÄKTA avant.

ÄKTAprocess instruments are delivered with another controller which is similar to the CU-950 but also includes a Profibus interface. See *Section 2.2.3 How to install CU-960, on page 38* for more information.

ÄKTA avant instruments use a software controller and are not compatible with UNICORN 5.31.

The LEDs on CU-950

There are three LEDs on the front of the CU-950 which can be in three different states:

- Off (no light)
- Flashing
- On (steady light)

The table below describes what the state of each LED means.

LED	Off	Flashing	On
Power	Power off	Power on, BIT running or BIT not OK	Power on, BIT OK
PC	Power off	Power on, no PC communication	Contact with PC established
System	Power off	Power on, no system (ÄKTA instrument) communication	Contact with system (ÄKTA instrument) established

BIT = Built-in test

Note: The system LED will flash while the system is scanning to identify all components. At the same time the run data instruments in the ***System Control*** module will read ***Scanning***. When the scanning process is completed, the system LED will stop flashing and the instruments will read ***Ready***. If any instrument component causes an error or is missing, this will be indicated in the UNICORN ***System Control*** module during the test.

CU-950 USB and CU-950 Advanced

There are two versions of the CU-950 controller, USB and Advanced. The table below describes how they connect and how many that can be connected to the PC.

Controller	Connector	Max. units connected
CU-950 USB	USB (Universal Serial Bus)	1
CU-950 Advanced	Ethernet	4

CU-950 system installation

To be able to control a system (an instrument) with the CU-950 controller the UNICORN software has to be set up accordingly. Usually this is done when the UNICORN software is installed for the first time, but it can also be done afterwards.

System installation during UNICORN software installation

The system installation part of the UNICORN software installation is described in *Section 2.3.2 How to install UNICORN, on page 44*.

System installation after UNICORN software installation

You can perform a CU-950 system installation after the UNICORN software has been installed. This is described in *Section 2.3.5 Define a system after UNICORN 5.31 is installed, on page 84*.

CU-950 Advanced port numbers

The TCP ports used by UNICORN for the CU-950 Advanced are shown in the table below. The port numbers shown in the column labelled CU 1 will be used for the first CU-950 (by default for a single connected CU-950). Additional connected CU-950 may be assigned to the other CU IDs, up to the maximum number of four connected units. Bi-directional traffic for the ports in question must be allowed in the firewall settings. The settings must be configured manually.

Channel	CU 1	CU 2	CU 3	CU 4
Software & Data storage	60033	60133	60233	60333
Download & Manual	60032	60132	60232	60332
Trend & Event	60031	60131	60231	60331
Info	60030	60130	60230	60330

2.2.3 How to install CU-960

When to use CU-960

The CU-960 controller is an interface to connect chromatography or synthesis instruments to a PC. CU-960 is used primarily together with ÄKTAprocess instruments. It features a Profibus interface, a standardized and efficient serial fieldbus which is optimized for process automation applications.

The LEDs on CU-960

There are three LEDs on the front of the CU-960 which can be in three different states:

- Off (no light)
- Flashing, with different flash rates
- On (steady light)

The table below describes what the state of each LED means.

LED	Off	Flashing	On
Power	Power off	Power on, BIT running or BIT not OK	Power on, BIT OK
PC	Power off	Power on, no PC communication	Contact with PC established
System	Power off	Power on. • Flash rate 2 Hz: No contact with ÄKTA system • Flash rate 0.5 Hz: No contact with Profibus system • Flash rate 1 Hz: No contact with both ÄKTA and Profibus systems	Contact with systems established

BIT = Built-in test

Note: The system LED will flash while the system is scanning to identify all components. At the same time the run data instruments in the ***System Control*** module will read ***Scanning***. When the scanning process is completed, the system LED will stop flashing and the instruments will read ***Ready***. If any instrument component causes an error or is missing, this will be indicated in the UNICORN ***System Control*** module during the test.

CU-960 USB and CU-960 Advanced

There are two versions of the CU-960 controller, USB and Advanced. The table below describes how they connect and how many that can be connected to the PC.

Controller	Connector	Max. units connected
CU-960 USB	USB (Universal Serial Bus)	1
CU-960 Advanced	Ethernet	4

CU-960 system installation

To be able to control a system (an instrument) with the CU-960 controller the UNICORN software has to be set up accordingly. Usually this is done when the UNICORN software is installed for the first time, but it can also be done afterwards.

System installation during UNICORN software installation

The system installation part of the UNICORN software installation is described in *Section 2.3.2 How to install UNICORN, on page 44*.

System installation after UNICORN software installation

You can perform a CU-960 system installation after the UNICORN software has been installed. This is described in *Section 2.3.5 Define a system after UNICORN 5.31 is installed, on page 84*.

CU-960 Advanced port numbers

The TCP ports used by UNICORN for the CU-960 Advanced are shown in the table below. The port numbers shown in the column labelled CU 1 will be used for the first CU-950 (by default for a single connected CU-960). Additional connected CU-960 may be assigned to the other CU IDs, up to the maximum number of four connected units. Bi-directional traffic for the ports in question must be allowed in the firewall settings. The settings must be configured manually.

Channel	CU 1	CU 2	CU 3	CU 4
Software & Data storage	60033	60133	60233	60333
Download & Manual	60032	60132	60232	60332
Trend & Event	60031	60131	60231	60331
Info	60030	60130	60230	60330

2.3 Software Installation

Introduction

The UNICORN software is normally pre-installed by a GE Healthcare representative. Follow the instructions in this chapter to install the program yourself if your system is not pre-installed.

Note: If the system is connected to the network and installed to support remote control, make sure that the same version of UNICORN is installed on *all* stations in the network.

In this section

This section contains these topics:

Section	See page
2.3.1 Preparations before installing UNICORN 5.31 on Windows 7	41
2.3.2 How to install UNICORN	44
2.3.3 How to install UNICORN for ÄKTAxpress	64
2.3.4 Upgrade a previous UNICORN 5.x installation to UNICORN 5.31	80
2.3.5 Define a system after UNICORN 5.31 is installed	84
2.3.6 Windows 7 post-installation settings	92

2.3.1 Preparations before installing UNICORN 5.31 on Windows 7

User Account Control on Windows 7

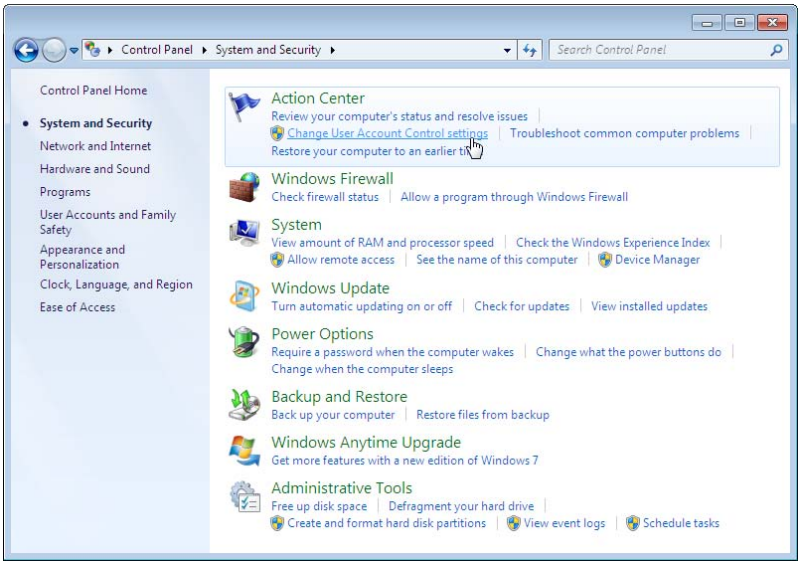
The User Account Control (UAC) feature in Windows 7 may cause problems during the UNICORN installation. Due to this, the UAC should be temporarily disabled before the installation. However, it is recommended that the UAC is restored immediately after the installation and system setup is completed. This is described in *Restore UAC, on page 97*.

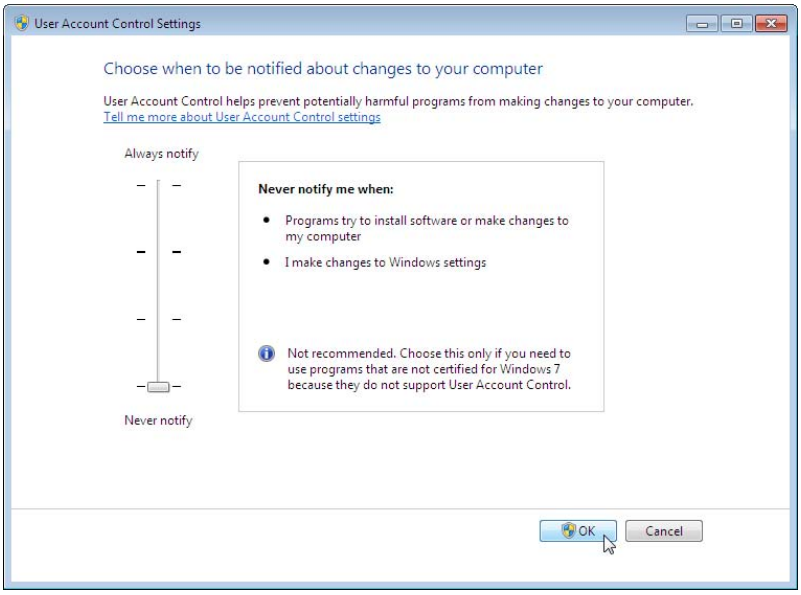
Disable UAC

The table below describes how to disable the Windows 7 User Account Control feature.

Step	Action
1	• Click the Windows ***Start*** button and • Choose the ***Control Panel***.
2	Click the ***Systems and Security*** heading.

Step	Action
3	Under the heading ***Action Center***, click the ***Change User Account Control settings*** option.



Step	Action
4	• Click and drag the slider control down to the position ***Never notify*** and • Click the ***OK*** button. 
5	• Acknowledge the change in the pop-up dialog, • close the Control Panel and • proceed with the UNICORN installation as described in *Section 2.3.2 How to install UNICORN, on page 44*.

2.3.2 How to install UNICORN

Different UNICORN versions

From UNICORN 5.01 on, different versions of the UNICORN software are available. Besides the Full version, a Remote and a Dry version are also available.

The table below describes the characteristics of the different versions.

UNICORN version	Characteristics
Full version	Complete functionality
Remote-only version	Only remote systems connected to an existing UNICORN server can be controlled. Local systems cannot be installed.
Dry version	The System Control module is not available. Therefore no systems can be controlled with this version of UNICORN.

In this section

In this section, the installation of the Full version of UNICORN is described. The installation procedure for the other versions is similar, though certain options are disabled.

This section describes a typical installation for an example system, an ÄKTAexplorer™. The procedure is similar for other ÄKTA systems, ÄKTAoligopilot systems, ÄKTAcrossflow™, BioProcess™ and ÄKTAprocess systems and the installation steps can be followed for all these systems. The installation procedure for ÄKTAxpress systems is different and it is described in *Section 2.3.3 How to install UNICORN for ÄKTAxpress, on page 64*.

Installation prerequisites

Before you start the installation procedure the following prerequisites have to be met.

- The operating system must be correctly installed on your computer:
  - Windows XP Professional (32-bit with service pack 3)
  - Windows 7 Professional (32-bit)

    or
  - Windows 7 Professional (64-bit)

  See the operating system documentation for details about the operating system installation.
- For network installations of UNICORN, the network must be correctly set up.

  See chapter *Chapter 1 Network setup, on page 5*.

Installation notes

Also notice the following:

- Perform the UNICORN installation procedure on each computer in the network for a network installation.
- A warning message is issued if you install UNICORN to an existing UNICORN server. It is not possible for the Setup program to check which UNICORN version is installed on the server, so the warning is general:

  "You are installing UNICORN to an existing UNICORN server on the network.

  All computers connected to the same UNICORN server on the network have to be of the same version for the software to work correctly. Please check that all computers connected to the UNICORN server you are connecting to is of the correct version. If another version is detected on one of the other computers connected to the UNICORN server, those computers have to be upgraded to the same version you are currently installing."
- You can exit the installation at any point by clicking on either the ***Cancel*** button or the ***Exit*** button. If you do this, however, the installation will be incomplete and the software cannot be used.
- After the installation, the installed files are compared with the original files on the installation CD to make sure that no files have been corrupted during installation. The criteria used for the file comparison are name, size, version and checksum.

Upgrading a UNICORN installation

How to upgrade a previous UNICORN installation is described in *Section 2.3.4 Upgrade a previous UNICORN 5.x installation to UNICORN 5.31, on page 80*.

Do not copy the CD-ROM or decompress the files

UNICORN is supplied on a CD-ROM. Files on the CD-ROM are compressed and cannot simply be copied onto the hard disk. During the installation procedure, the required folder structure is created on the hard disk and the files are decompressed. Do *not* attempt to decompress the files using any other file decompression utility.

Step 1 - Insert the Setup CD

Follow the instructions in the table below to begin the installation:

Step	Action
1	For network installations, log on to the network and check that you have access to the server disk and folder where the UNICORN network components are to be installed.
2	• Insert the CD-ROM disk into the CD-ROM drive. The UNICORN InstallShield Wizard should start automatically. If not, follow the applicable instruction in the table below:

If you are using Windows XP...	If you are using Windows 7...
• click the Windows ***Start*** button and select ***Run*** • type the command `d:\setup`, where `d:` is the unit for your CD-ROM drive. • click ***OK***.	• click the Windows ***Start*** button • In the Search programs and files field, type `d:\setup`, where `d:` is the unit for your CD-ROM drive. • Press the **Enter** key.

3	The UNICORN 5.31 InstallShield Wizard is launched. Continue with the setup below.

Step 2 - Install prerequisite applications

Before the actual UNICORN installation can begin, a number of prerequisite applications must be installed if they are not previously installed. The applications are available in the folder *ISSetupPrerequistes* on the installation CD, but the installation will proceed automatically for each required application. The applications are listed in the table below.

Note: Some of these applications will require a restart of the computer before the installations can proceed. This is noted in the table.

When installing on...	Then the following applications are required:
Windows XP	• Microsoft Visual C++™ 2008 Redistributable Package (x86) • Microsoft .Net Framework 2.0 • OPC Core Components Redistributable (x86) 101.2 • Windows Installer 4.5 for Windows XP SP2 and later (x86) *(Restart required)*
Windows 7 (32-bit)	• Microsoft Visual C++ 2008 Redistributable Package (x86) • OPC Core Components Redistributable (x86) 101.2 • SetSystemPermissions *(Restart required)*
Windows 7 (64-bit)	• Microsoft Visual C++ 2008 Redistributable Package x64 9.0.30729.17 • OPC Core Components Redistributable (x64) 105.0 • SetSystemPermissions *(Restart required)*

Note: A version of Adobe™ Acrobat Reader™ is also distributed on the installation CD.

Step 3 - License agreement and user information

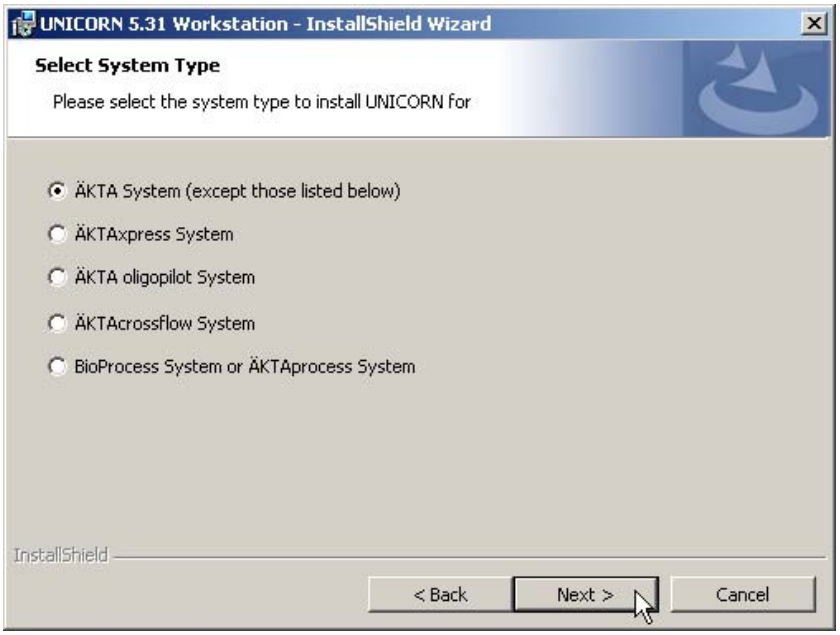
This table describes how to complete step 3 of the UNICORN installation:

Step	Action
1	• The ***Welcome*** dialog box is displayed. • Click the ***Next*** button to continue.
2	• The ***UNICORN Software License Agreement*** dialog box is displayed. You must accept the license agreement to install UNICORN. • Click the ***Next*** button to continue.

Step	Action
3	• The ***Customer Information*** dialog box is displayed. Type your name, organization and the product serial number of the software. The serial number can be found on the License Agreement that is shipped with the CD. • Click the ***Next*** button to continue.

Step 4 - Select System Type

In the ***Select System Type*** dialog box you choose the type of system (instrument) you will use.



- Click the button that corresponds to the system you wish to install UNICORN for.

  and
- click the ***Next*** button to continue.

Step 5 - Select Destination Folder

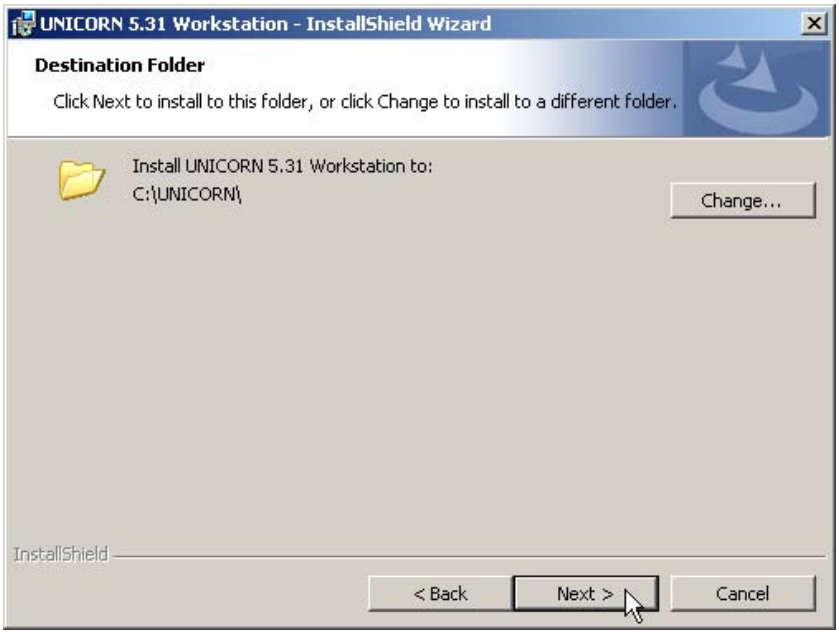
In the ***Destination Folder*** dialog box you choose the folder where UNICORN will be installed. The default destination folder is `C:\UNICORN\`.

- If this is suitable, click the ***Next*** button to proceed

  or

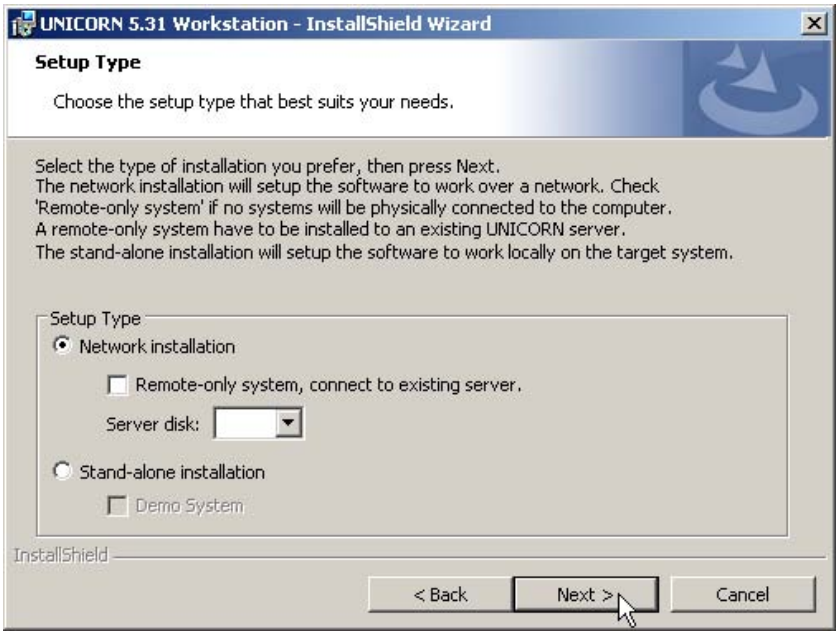
- Follow the instruction below to choose another folder:

Step	Action
1	Click the ***Change*** button to open the ***Change Current Destination Volume*** dialog.
2	Select the destination volume where the program is to be installed. This should be on a physical disk drive on the computer where you install UNICORN, not on a network disk drive.
3	• Click the ***OK*** button to continue. • Click the ***Yes*** button if asked whether Setup should create the UNICORN program folder.



Step 6 - Setup Type

The ***Setup Type*** dialog box is displayed:



Note: The Setup Type options are limited in the Remote and Dry versions of UNICORN as described in *Section 2.3.2 How to install UNICORN, on page 44*.

The table below describes how to select the setup type:

Step	Action
1	You can perform either a ***Stand-alone installation*** or a ***Network installation***. For more information about the options, read • *Step 6 - Stand-alone Installation* and • *Step 6 - Network Installation*
2	When you have made your selections, click the ***Next*** button to continue.

Step 6 - Stand-alone installation

A stand-alone installation can be either

- a local station
- a demo station.

Select the ***Demo system*** check box if you want to install a demo station.

The network options settings are ignored for a stand-alone installation.

Note: If you perform a stand-alone installation and later want to connect the system to a network, you must remove the current installation and install the software with the appropriate settings.

Step 6 - Network installation

A network installation can be either

- a local station

  or

- a remote-only system.

You have to select these disk drives in a network installation:

- A local disk for the program files

  (This was determined in step 5 when the destination folder was selected)

- A server disk for the server files

Select the ***Remote-only system*** check box to install a remote-only system, that being a computer to which no systems are physically connected.

Note: When you perform a network installation, the necessary UNICORN software components will be copied automatically to the network server disk.

Step 7 - Program Settings

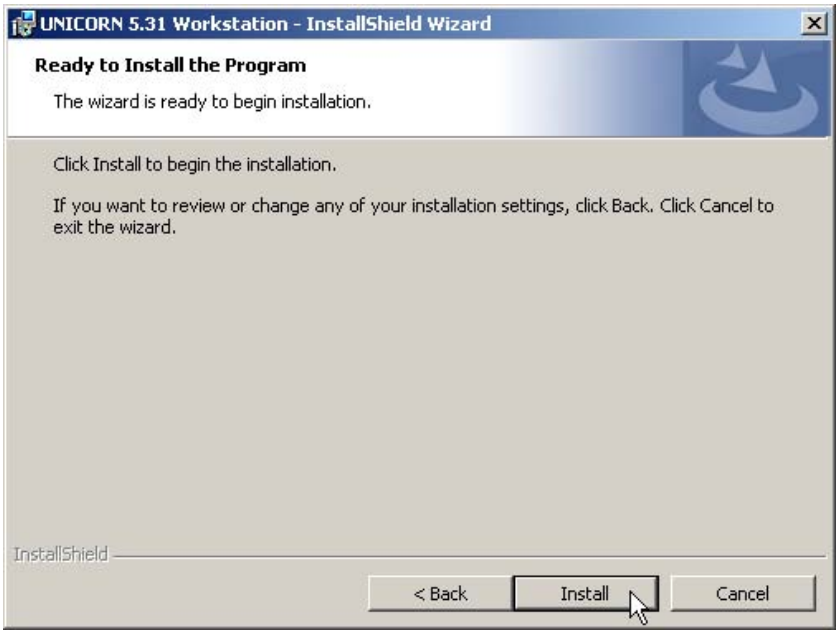
Follow the instructions in the table below to set the required parameters for password and system control windows:

Step	Action
1	Select ***Password required*** and type the minimum number of characters required for passwords. Valid numbers of password characters are 3 -15. Select ***No password required*** if you do not require password protection. With this setting, users can be defined with or without passwords. **Note:** Make sure that you enter the same password settings on each station in a network.
2	Choose the number of ***System Control Windows*** that should be available in the installation. Maximum value is 4.
3	Click the ***Next*** button to continue.

Step 8 - Perform the installation

The wizard is ready to perform the installation. If the settings are correct, click the ***Install*** button to copy the files.

Tip: If you want to make any changes you can click the ***Back*** button one or more times.



Note: During the installation, traffic will be enabled on Port TCP 139 through the Windows Firewall. A warning dialog may be shown and must be accepted before the installation can be completed.

Step 9 - Installation completed

The software installation wizard is now completed. Click the ***Finish*** button to close the wizard and re-start the computer.

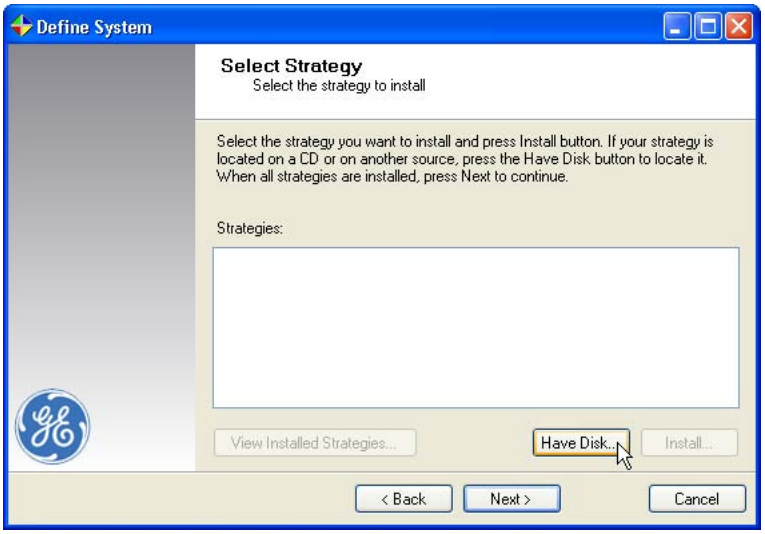
Tip: Select the ***Launch Define System Wizard*** checkbox to proceed with system definitions as the next step.


UNICORN 5.31 Workstation - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed UNICORN 5.31 Workstation. Click Finish to exit the wizard.
Note! Port TCP 139 is enabled in the Windows Firewall.
To enable communication between UNICORN software and an instrument, a system needs to be defined. To define a system, make sure that this computer is connected to at least one instrument.
Launch Define System Wizard
The computer will be restarted for the configuration changes to take effect.
< Back
Finish
Cancel

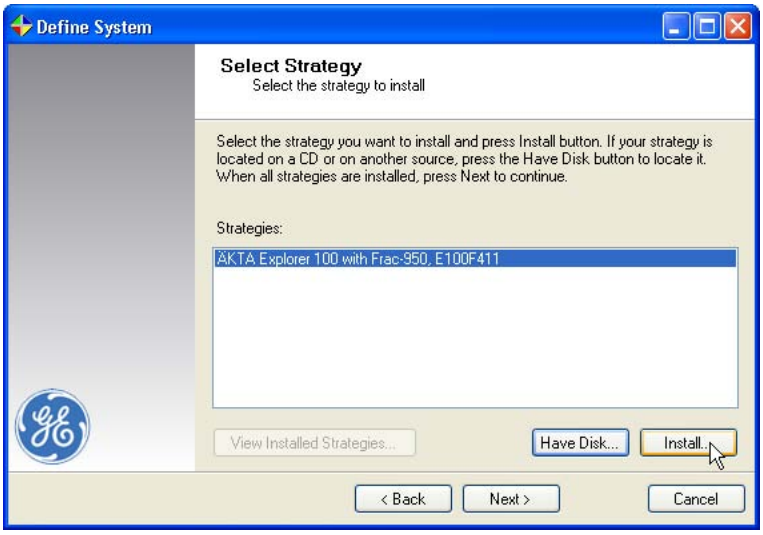
Step 10 - Strategy installation

The table below describes the first step in the system definition, the ***Strategy Installation***:

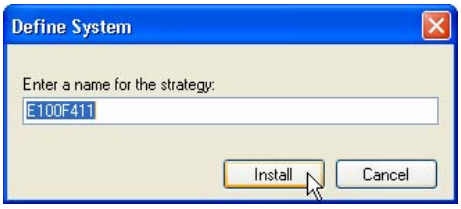
Step	Action
1	Provided you selected the ***Launch Define System Wizard*** in the ***InstallShield Wizard Completed*** dialog, the ***Define System*** wizard will now launch automatically, showing a ***Welcome*** dialog. **Tip:** After installing UNICORN 5.31, you can also start the Define System wizard from the Windows Programs menu. Choose the ***Define System*** menu item from the GE Healthcare:UNICORN 5.3 menu. • Click the ***Next*** button to start defining the system. *Result:* The ***Select Strategy*** dialog opens.
2	Click the ***Have Disk*** button. *Result:* The ***Browse For Folder*** dialog opens.



Step	Action
3	• Browse to the folder where the strategy is located. Normally, the strategy will be distributed on a separate CD. • Select the strategy file and click the ***OK*** button. *Result*: The strategy is added to the ***Strategies*** field of the ***Select Strategy*** dialog.

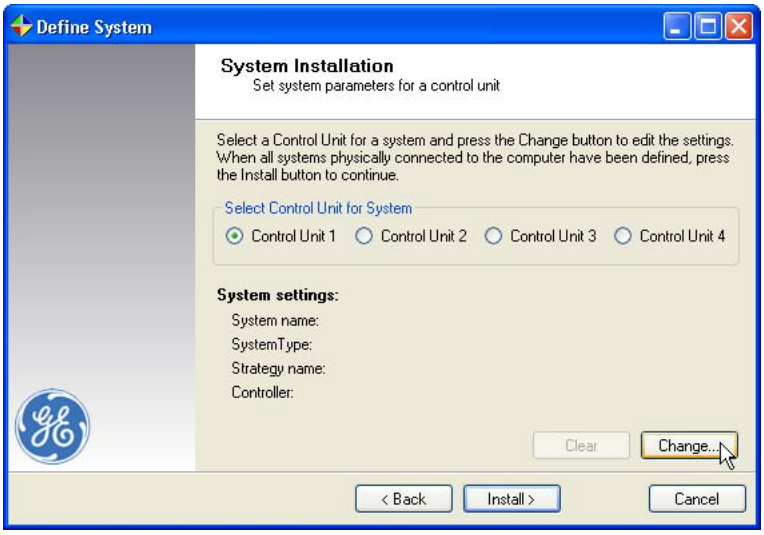


4	Click the ***Install*** button. *Result*: The ***Define System*** dialog for naming the strategy opens.



Step	Action
5	Click the ***Install*** button. *Result*: The selected strategy is installed, using the entered name. **Tip:** You can repeat this to install several strategies before you proceed with the next step. Click the ***View Installed Strategies*** button to see a list of all strategies that have been installed on the workstation.
6	Click the ***Next*** button to proceed with the System Installation step.

Step 11 - System Installation

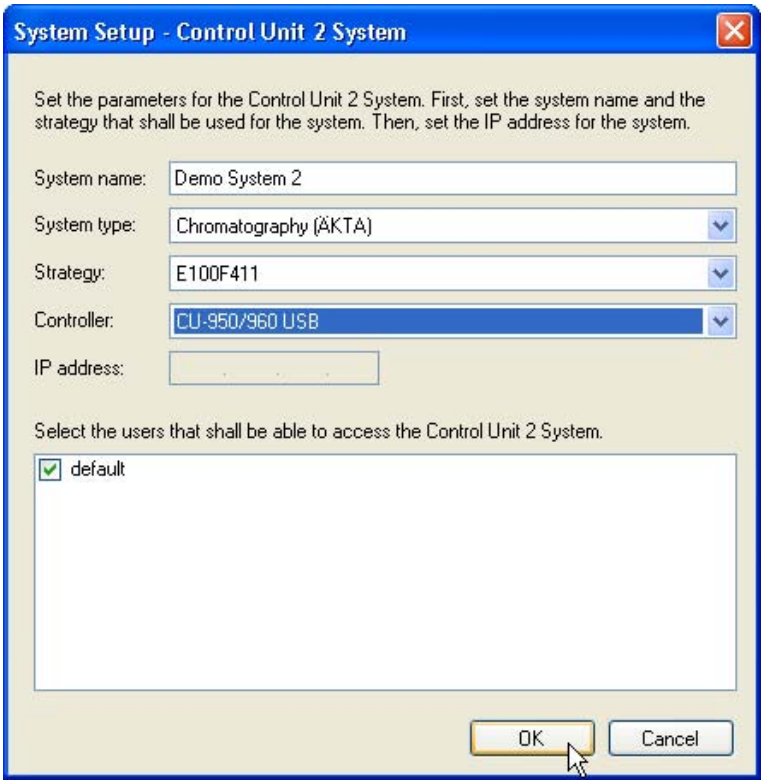


The table below describes how to define each system that is directly connected to the PC.

Step	Action
1	• Click one of the radio buttons to select a system. • Click the ***Change*** button to set up the system. *Result:* The ***System Setup*** dialog box is displayed.

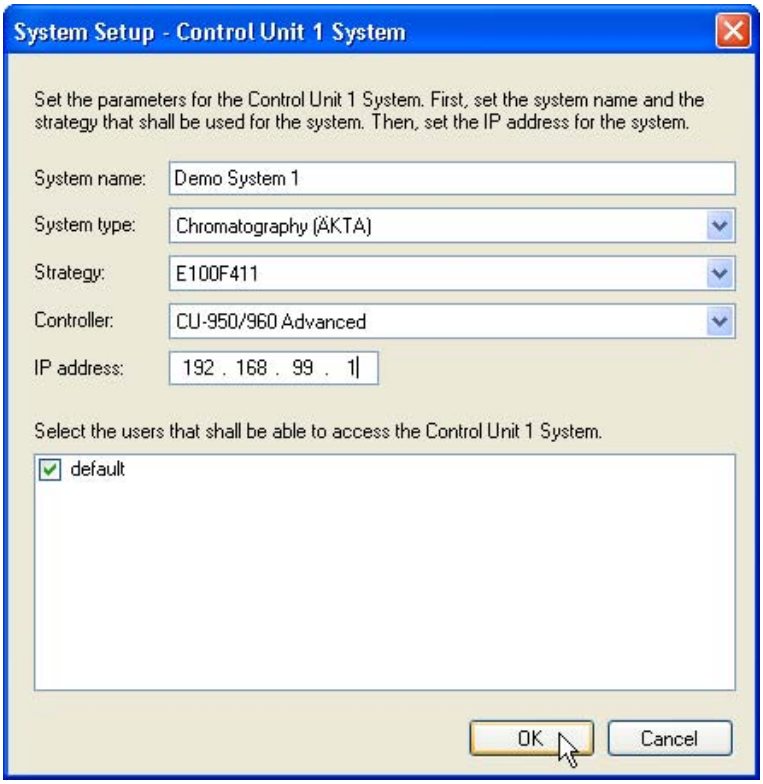
Step	Action
2	In the ***System Setup*** dialog box you set the system parameters for each system connected to the PC, one system at a time. Continue with the step that correspond to the controller(s) you will use: • CU-950/960 USB (with USB connection), see step 3 a below. • CU-950/960 Advanced (with Ethernet connection), see step 3 b below. **Note:** You can only use one type of controller for each workstation.

Step	Action
3 a	**System Setup for CU-950/960 USB**



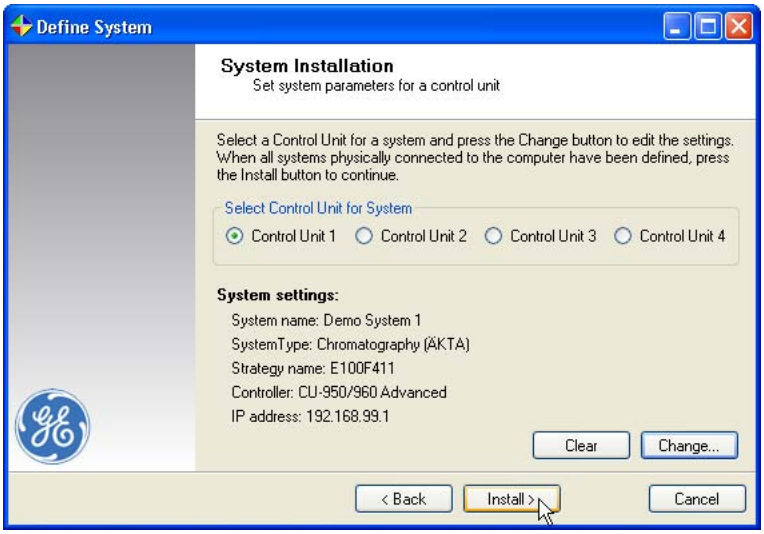
- Type a new ***System name***.
- Choose the ***System type*** and ***Strategy***.
- Choose the ***Controller*** type (USB).
- Select the users that will have access to the system. At the installation, the only available user will be the ***default*** user. You can give other users access to the system at a later stage.
- When you are finished, click ***OK***.

Step	Action
3 b	**System Setup for CU-950/960 Advanced**

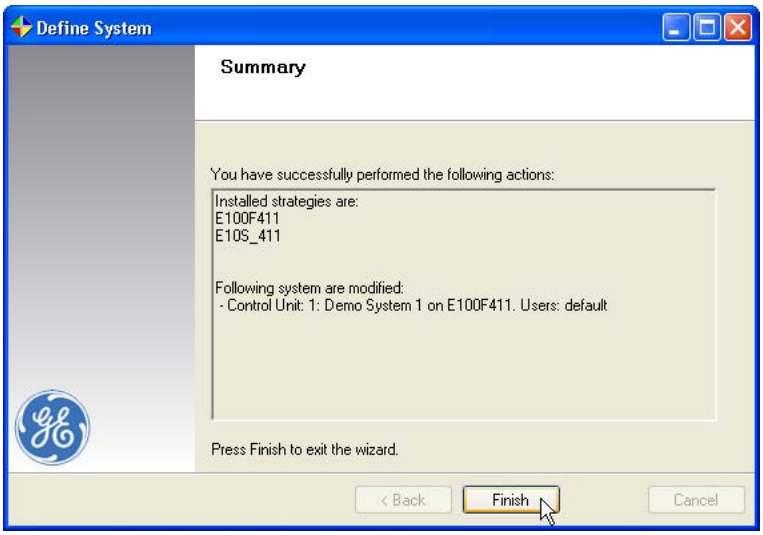


- Type a new ***System name***.
- Choose the ***System type*** and ***Strategy***.
- Choose the ***Controller*** type (Advanced).
- Enter the IP address for the controller units. This is shown on a label on the unit.
- Select the users that will have access to the system. At the installation, the only available user will be the ***default*** user. You can give other users access to the system at a later stage.
- When you are finished, click ***OK***.

Step	Action
4	The ***System Installation*** wizard dialog is displayed again showing the options you have chosen.



5	If there is more than one system to define, repeat steps 1 to 4 in this table for each system.

Step	Action
6	• Click the ***Install*** button to copy the necessary files. *Result:* The ***Summary*** dialog opens when the system definition is completed.  **Note:** If you installed more than one system, make a note of which system is connected to which control unit. This information will be useful when you set up the system table or if you must reinstall UNICORN in the future.

Step 12 - Setup Complete

The installation is complete and the computer must be restarted:

- Click the ***Finish*** button to exit the setup program and automatically restart the computer.

Note: You will need to acknowledge the restart in a warning dialog before it is performed.

Note: If a firewall is used, some ports may have to be opened for traffic manually.

- It is necessary to open port 135 for DCOM (OPC) in order for the communication between the UNICORN OPC server and OPC clients to work.
- If CU-950/CU-960 Advanced is used, a number of ports must be opened for communication. This is described in *CU-950 Advanced port numbers, on page 37* and *CU-960 Advanced port numbers, on page 39*.

For Windows Firewall:

- Select the ***Exceptions*** tab
- Click the ***Add Port*** button and
- add the ports to the ***Exceptions*** list.

2.3.3 How to install UNICORN for ÄKTAxpress

Installation prerequisites

Before you start the installation procedure the following prerequisites have to be met.

- The operating system must be correctly installed on your computer:
  - Windows XP Professional (32-bit with service pack 3)
  - Windows 7 Professional (32-bit)

    or
  - Windows 7 Professional (64-bit)

  See the operating system documentation for details about the operating system installation.
- For network installations of UNICORN, the network must be correctly set up.

  See chapter *Chapter 1 Network setup, on page 5*.

Installation notes

Also notice the following:

- Perform the UNICORN installation procedure on each computer in the network for a network installation.
- A warning message is issued if you install UNICORN to an existing UNICORN server. It is not possible for the Setup program to check which UNICORN version is installed on the server, so the warning is general:

  "You are installing UNICORN to an existing UNICORN server on the network.

  All computers connected to the same UNICORN server on the network have to be of the same version for the software to work correctly. Please check that all computers connected to the UNICORN server you are connecting to is of the correct version. If another version is detected on one of the other computers connected to the UNICORN server, those computers have to be upgraded to the same version you are currently installing."
- You can exit the installation at any point by clicking on either the ***Cancel*** button or the ***Exit*** button. If you do this, however, the installation will be incomplete and the software cannot be used.
- After the installation, the installed files are compared with the original files on the installation CD to make sure that no files have been corrupted during installation. The criteria used for the file comparison are name, size, version and checksum.

Upgrading a UNICORN installation

How to upgrade a previous UNICORN installation is described in *Section 2.3.4 Upgrade a previous UNICORN 5.x installation to UNICORN 5.31, on page 80*.

Do not copy the CD-ROM or decompress the files

UNICORN is supplied on a CD-ROM. Files on the CD-ROM are compressed and cannot simply be copied onto the hard disk. During the installation procedure, the required folder structure is created on the hard disk and the files are decompressed. Do *not* attempt to decompress the files using any other file decompression utility.

Step 1 - Insert the Setup CD

Follow the instructions in the table below to begin the installation:

Step	Action
1	For network installations, log on to the network and check that you have access to the server disk and folder where the UNICORN network components are to be installed.
2	• Insert the CD-ROM disk into the CD-ROM drive. The UNICORN InstallShield Wizard should start automatically. If not, follow the applicable instruction in the table below:

If you are using Windows XP...	If you are using Windows 7...
• click the Windows ***Start*** button and select ***Run*** • type the command `d:\setup`, where `d:` is the unit for your CD-ROM drive. • click ***OK***.	• click the Windows ***Start*** button • In the Search programs and files field, type `d:\setup`, where `d:` is the unit for your CD-ROM drive. • Press the **Enter** key.

3	The UNICORN 5.31 InstallShield Wizard is launched. Continue the setup below.

Step 2 - Install prerequisite applications

Before the actual UNICORN installation can begin, a number of prerequisite applications must be installed if they are not previously installed. The applications are available in the folder *ISSetupPrerequistes* on the installation CD, but the installation will proceed automatically for each required application. The applications are listed in the table below.

Note: Some of these applications will require a restart of the computer before the installations can proceed. This is noted in the table.

When installing on...	Then the following applications are required:
Windows XP	• Microsoft Visual C++™ 2008 Redistributable Package (x86) • OPC Core Components Redistributable (x86) 101.2 • Windows Installer 4.5 for Windows XP SP2 and later (x86) *(Restart required)*
Windows 7 (32-bit)	• Microsoft Visual C++ 2008 Redistributable Package (x86) • OPC Core Components Redistributable (x86) 101.2 • SetSystemPermissions *(Restart required)*
Windows 7 (64-bit)	• Microsoft Visual C++ 2008 Redistributable Package x64 9.0.30729.17 • OPC Core Components Redistributable (x64) 105.0 • SetSystemPermissions *(Restart required)*

Note: A version of Adobe™ Acrobat Reader™ is also distributed on the installation CD.

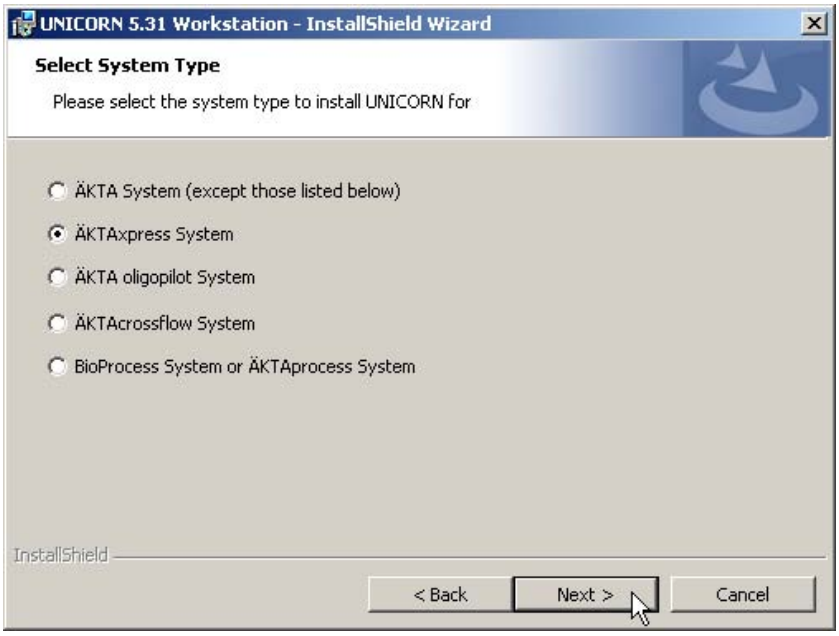
Step 3 - License agreement and user information

The table below describes how to complete step 3 of the UNICORN installation.

Step	Action
1	• The ***Welcome*** dialog box is displayed. • Click the ***Next*** button to continue.
2	• The ***UNICORN License Agreement*** dialog box is displayed. You must accept the license agreement to install UNICORN. • Click the ***Next*** button to continue.
3	• The ***Customer Information*** dialog box is displayed. Type your name, organization and the product serial number of the software. The serial number can be found on the License Agreement that is shipped with the CD. • Click the ***Next*** button to continue.

Step 4 - Select System Type

In the ***Select System Type*** dialog box you choose the type of system you will use, an ÄKTAxpress system or a UNICORN system other than ÄKTAxpress.



- Select the ***ÄKTAxpress System*** option

  and

- click the ***Next*** button to continue.

Step 5 - Select Destination Folder

In the ***Destination Folder*** dialog box you choose the folder where UNICORN will be installed. The default destination folder is `C:\UNICORN\`.

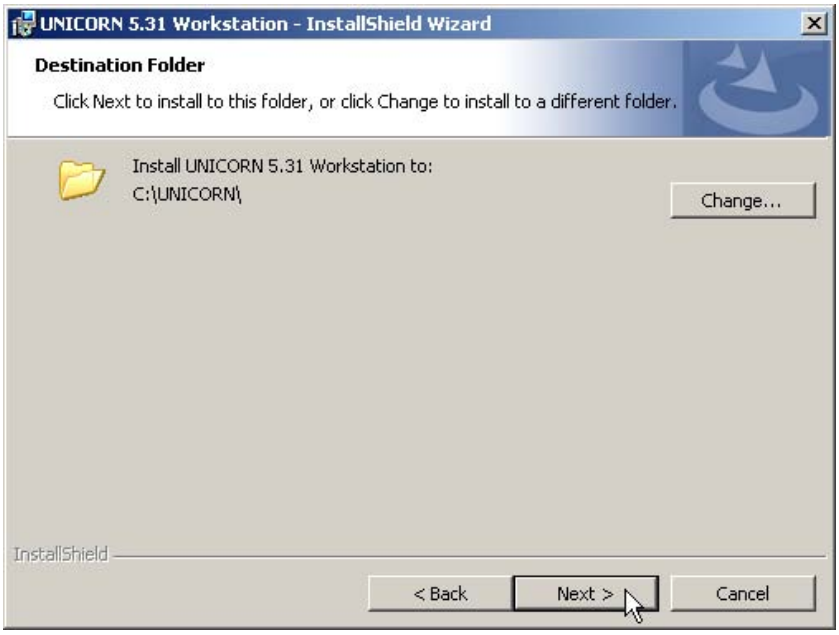
- If this is suitable, click the ***Next*** button to proceed

  or

- Follow the instruction below to choose another folder:

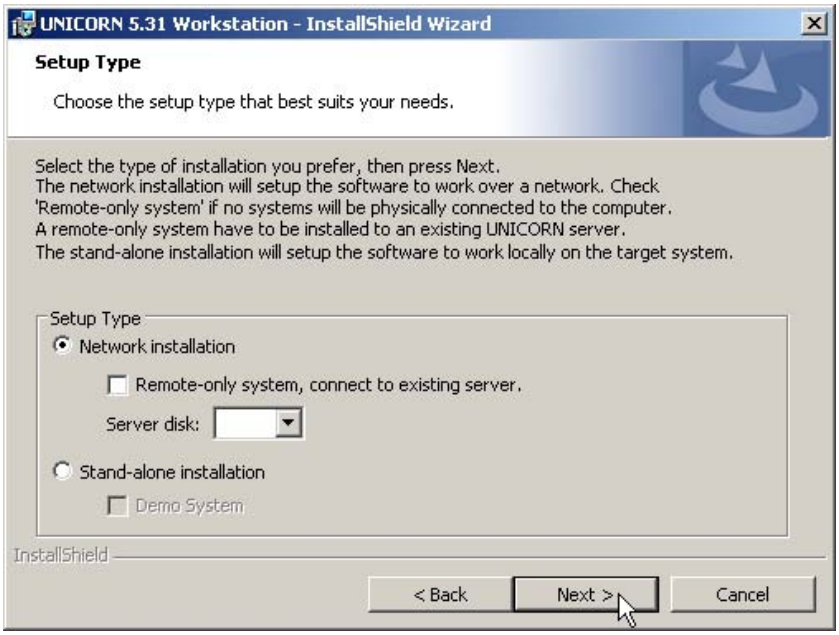
Step	Action
1	Click the ***Change*** button to open the ***Change Current Destination Volume*** dialog.

Step	Action
2	Select the destination volume where the program is to be installed. This should be on a physical disk drive on the computer where you install UNICORN, not on a network disk drive.
3	• Click the ***OK*** button to continue. • Click the ***Yes*** button if asked whether Setup should create the UNICORN program folder.



Step 6 - Setup Type

The ***Setup Type*** dialog box is displayed:



The table below describes how to select the setup type:

Step	Action
1	You can perform either a ***Stand-alone installation*** or a ***Network installation***. For more information about the options, read • *Step 6 - Stand-alone Installation* and • *Step 6 - Network Installation*
2	When you have made your selections, click the ***Next*** button to continue.

Step 6 - Stand-alone installation

A stand-alone installation can be either

- a local station
- a demo station.

Select the ***Demo system*** check box if you want to install a demo station.

The network options settings are ignored for a stand-alone installation.

Note: If you perform a stand-alone installation and later want to connect the system to a network, you must remove the current installation and install the software with the appropriate settings.

Step 6 - Network installation

A network installation can be either

- a local station

  or

- a remote-only system.

You have to select these disk drives in a network installation:

- A local disk for the program files

  (This was determined in step 5 when the destination folder was selected)

- A server disk for the server files

Select the ***Remote-only system*** check box to install a remote-only system, that being a computer to which no systems are physically connected.

Note: When you perform a network installation, the necessary UNICORN software components will be copied automatically to the network server disk.

Step 7 - Program Settings

Follow the instructions in the table below to set the required parameters for password and system control windows:

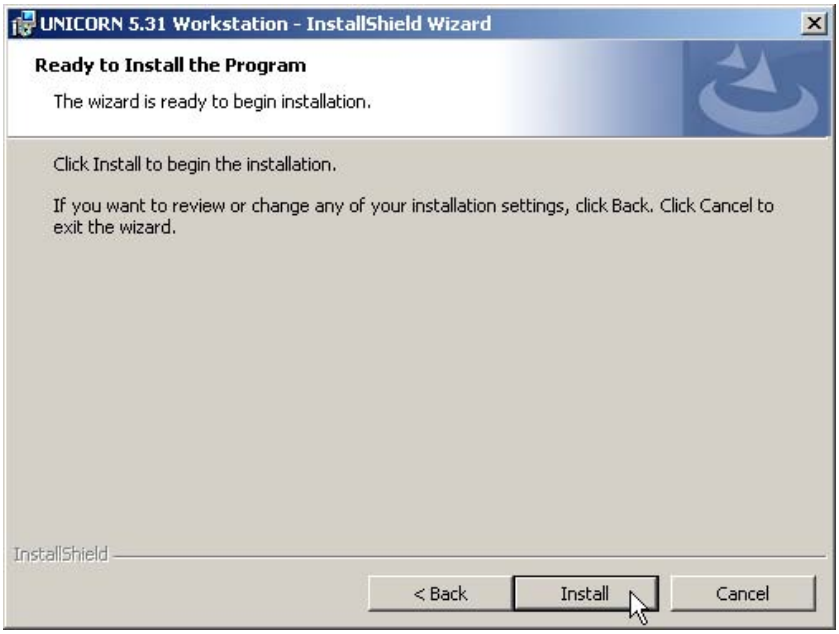
Step	Action
1	Select ***Password required*** and type the minimum number of characters required for passwords. Valid numbers of password characters are 3 -15. Select ***No password required*** if you do not require password protection. With this setting, users can be defined with or without passwords. **Note:** Make sure that you enter the same password settings on each station in a network.

Step	Action
2	• Choose the ***Advanced*** layout option for ***System Control***, where up to four ÄKTAexplorer 100 systems can be monitored from a single ***System Control*** window. One system is viewed at a time. The system that is viewed in the ***Advanced*** layout is selected from a sidebar in the ***System Control***. or • Choose the Standard layout option where each system is viewed in a separate System Control window. The maximum number of System Control windows is 4. 
3	Click the ***Next*** button to continue.

Step 8 - Perform the installation

The wizard is ready to perform the installation. If the settings are correct, click the ***Install*** button to copy the files.

Tip: If you want to make any changes you can click the ***Back*** button one or more times.



Note: During the installation, traffic will be enabled on Port TCP 139 through the Windows Firewall. A warning dialog may be shown and must be accepted before the installation can be completed.

Step 9 - Installation completed

The software installation wizard is now completed. Click the ***Finish*** button to close the wizard and re-start the computer.

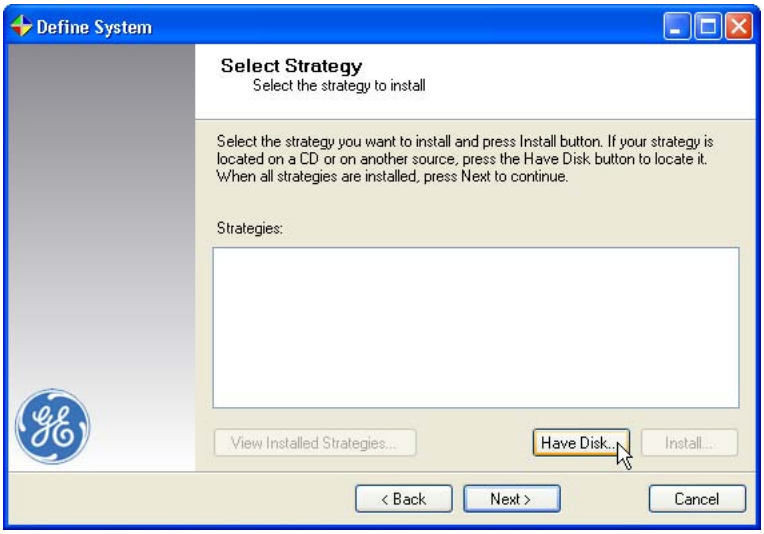
Tip: Select the ***Launch Define System Wizard*** checkbox to proceed with system definitions as the next step.

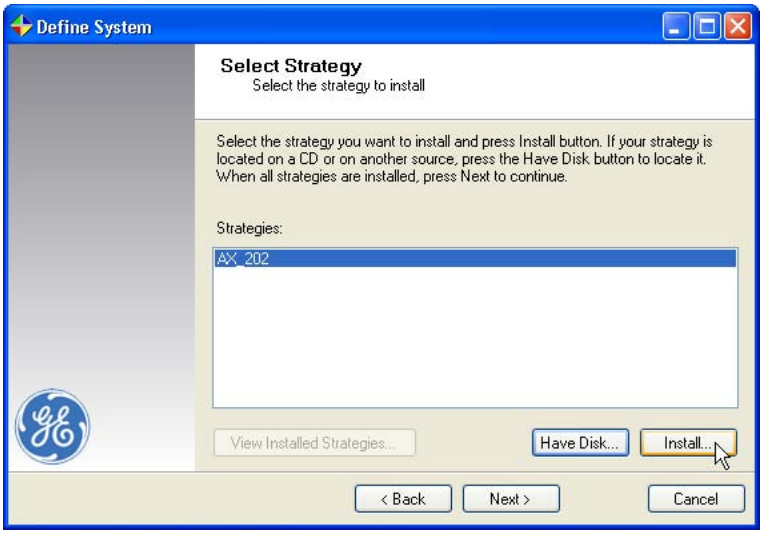
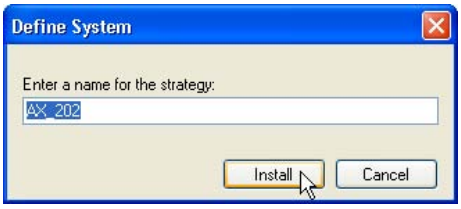

UNICORN 5.31 Workstation - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed UNICORN 5.31 Workstation. Click Finish to exit the wizard.
Note! Port TCP 139 is enabled in the Windows Firewall.
To enable communication between UNICORN software and an instrument, a system needs to be defined. To define a system, make sure that this computer is connected to at least one instrument.
Launch Define System Wizard
The computer will be restarted for the configuration changes to take effect.
< Back
Finish
Cancel

Step 10 - Strategy installation

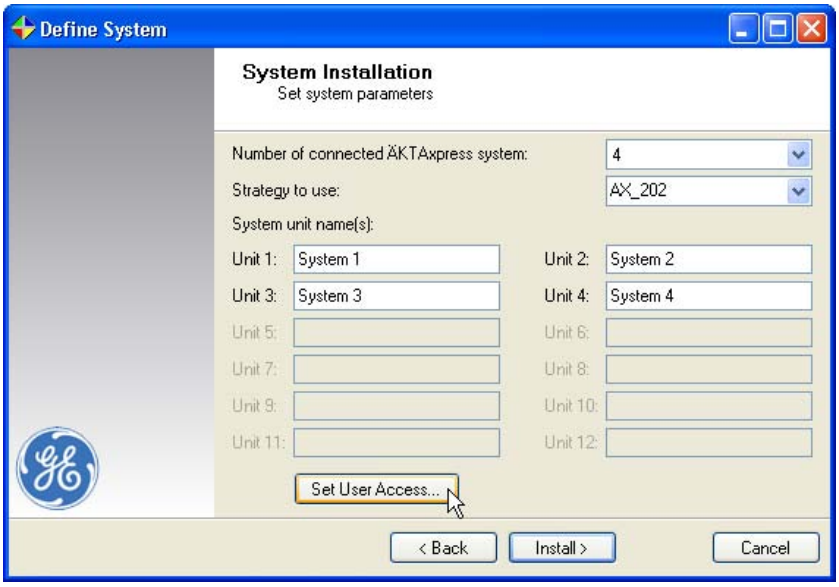
The table below describes the first step in the system definition, the ***Strategy Installation***:

Step	Action
1	Provided you selected the ***Launch Define System Wizard*** in the ***InstallShield Wizard Completed*** dialog, the ***Define System*** wizard will now launch automatically, showing a ***Welcome*** dialog. **Tip:** After installing UNICORN 5.31, you can also start the Define System wizard from the Windows Programs menu. Choose the ***Define System*** menu item from the GE Healthcare:UNICORN 5.3 menu. • Click the ***Next*** button to start defining the system. *Result:* The ***Select Strategy*** dialog opens.
2	Click the ***Have Disk*** button. *Result:* The ***Browse For Folder*** dialog opens.



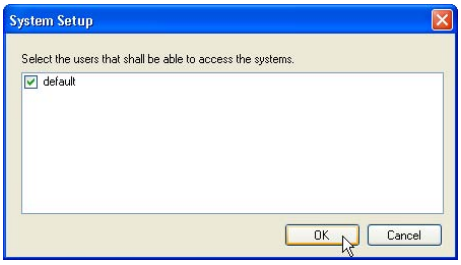
Step	Action
3	• Browse to the folder where the strategy is located. Normally, the strategy will be distributed on a separate CD. • Select the strategy file and click the ***OK*** button. *Result*: The strategy is added to the ***Strategies*** field of the ***Select Strategy*** dialog. 
4	Click the ***Install*** button. *Result*: The ***Define System*** dialog for naming the strategy opens. 
5	Click the ***Install*** button. *Result*: The selected strategy is installed, using the entered name.
6	Click the ***Next*** button to proceed with the System Installation step.

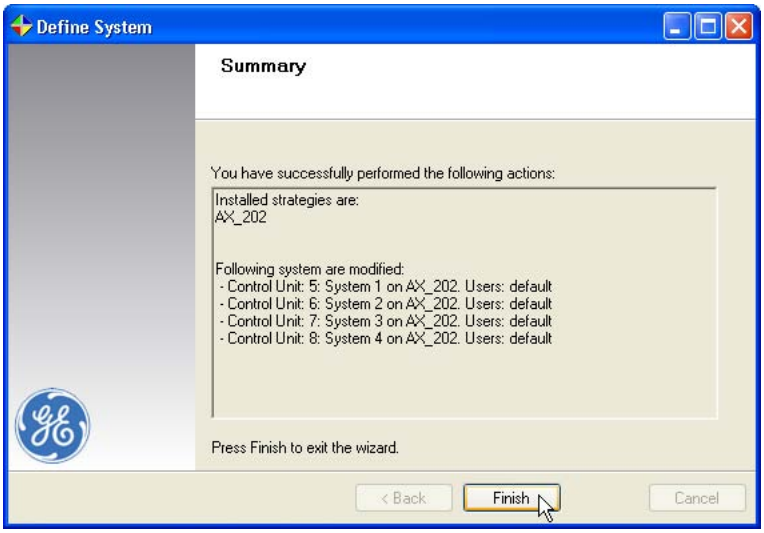
Step 11 - System Installation



The table below describes how to define each ÄKTAxpress system that is directly connected to the PC.

Step	Action
1	Choose the number of ÄKTAxpress systems to connect. The maximum number is 12.
2	Choose the strategy to use. The same strategy should be used for all connected ÄKTAxpress systems.
3	UNICORN will define units for as many ÄKTAxpress systems you chose to define in step 1. Default system names will be entered. • If desired, change the default system names.

Step	Action
4	Click the ***Set User Access...*** button. *Result:* The ***System Setup*** user selection dialog opens. 
5	• Select the users that will have access to the systems and • click the ***OK*** button to close the dialog. **Tip:** The default user will be available if no other user has been defined yet. You can define additional users and authorize system access at a later stage if you so desire. This is described in *Section 6.3.4 How to assign user properties, on page 175*.

Step	Action
6	Click the ***Install*** button to perform the system installation with the chosen selections. *Result:* The ***Summary*** dialog opens when the system definition is completed. 

Step 12 - Setup Complete

The installation is complete and the computer must be restarted:

- Click the ***Finish*** button to exit the setup program and automatically restart the computer.

2.3.4 Upgrade a previous UNICORN 5.x installation to UNICORN 5.31

Introduction

If a previous UNICORN 5.x installation is detected when the UNICORN 5.31 installation is initiated, the InstallShield Wizard will automatically start an upgrade instead of a new installation.

Note: UNICORN installations on computers with Windows Vista™ operating system should not be upgraded to UNICORN 5.31 without changing the operating system to either Windows XP or Windows 7.

Before the upgrade

It is recommended that you save a backup of all important result files before you perform the upgrade.

Upgrade procedure

The table below describes how to upgrade a previous UNICORN installation to UNICORN 5.31:

Step	Action
1	• Insert the CD-ROM disk into the CD-ROM drive. The UNICORN InstallShield Wizard should start automatically. If not, follow the applicable instruction in the table below:

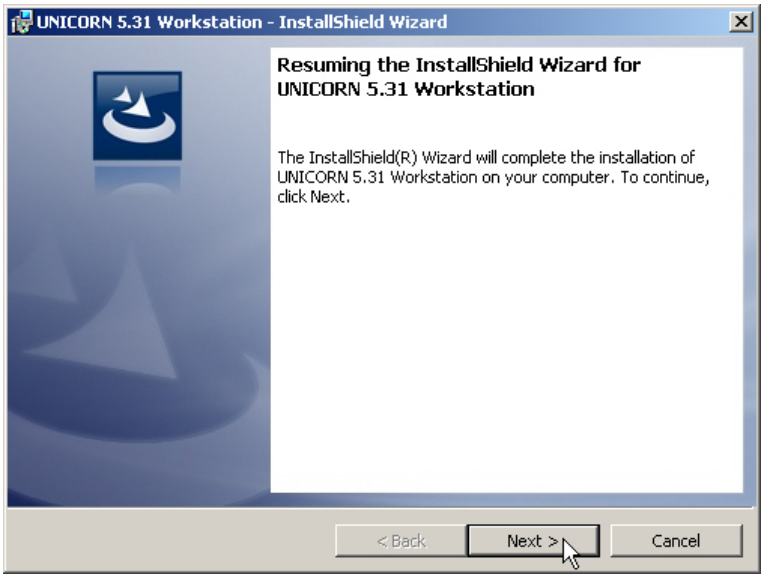
If you are using Windows XP...	If you are using Windows 7...
• click the Windows ***Start*** button and select ***Run*** • type the command `d:\setup`, where `d:` is the unit for your CD-ROM drive. • click ***OK***.	• click the Windows ***Start*** button • In the Search programs and files field, type `d:\setup`, where `d:` is the unit for your CD-ROM drive. • Press the **Enter** key.

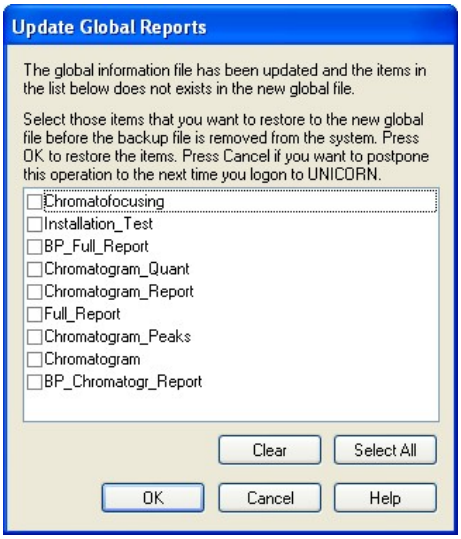
• Click the ***Next*** button in the Welcome dialog to start the upgrade.

Result: The ***License Agreement*** dialog opens.

Step	Action
2	• You must accept the license agreement to install UNICORN and • click the ***Next*** button to continue.
3	The InstallShield Wizard will detect the previous installation and suggest an upgrade. • Click ***Next*** to accept the upgrade and proceed.

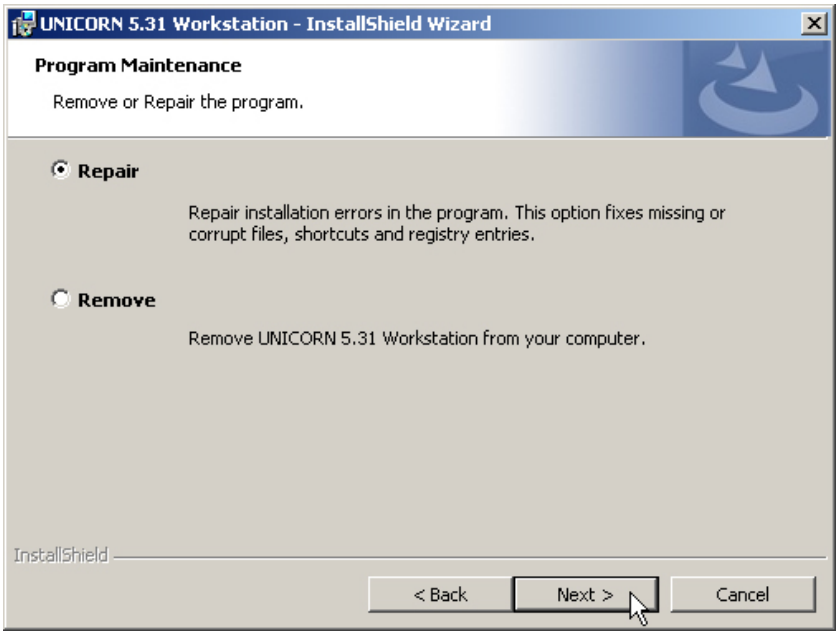
4	The upgrade will be performed using the old UNICORN settings. • Click the ***Next*** button to perform the upgrade. *Result:* The installation starts.



Step	Action
5	A confirmation dialog opens when the UNICORN 5.31 installation is completed. • Click the ***Finish*** button to complete the InstallShield Wizard. *Result:* The ***Update Global Reports*** dialog opens.
6	The new global information file will not automatically include all items contained in the global information file from the previous installation. However, the listed items can be restored from the old file before the backup version of the file is removed by the upgrade process. • Select all items you want to restore and • click ***OK***. 
7	The upgrade installation is complete and the computer will automatically be restarted.

Repair or remove UNICORN 5.31 installations

The UNICORN 5.31 installation procedure may also be used to either repair or to remove a UNICORN 5.31 installation. When the InstallShield Wizard detects a previous installation of UNICORN 5.31, it will suggest repair or remove options. Installation repair or removal can either be initiated using the installation CD, or by using the Add or Remove Programs procedure from the Windows Control Panel.



2.3.5 Define a system after UNICORN 5.31 is installed

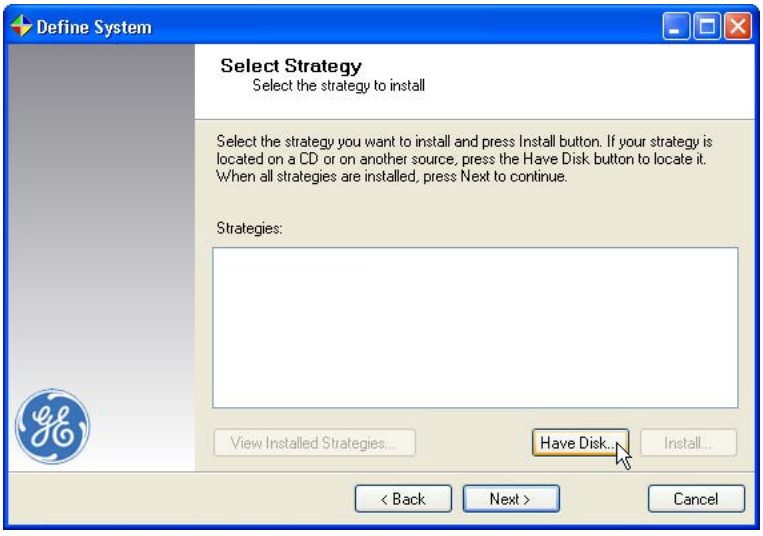
Introduction

You can define additional systems after the UNICORN 5.31 is completed, up to the maximum number. The Define System wizard is available from the Windows Programs menu, under GE Healthcare:UNICORN 5.31. This system definition is described below.

Start and install a strategy

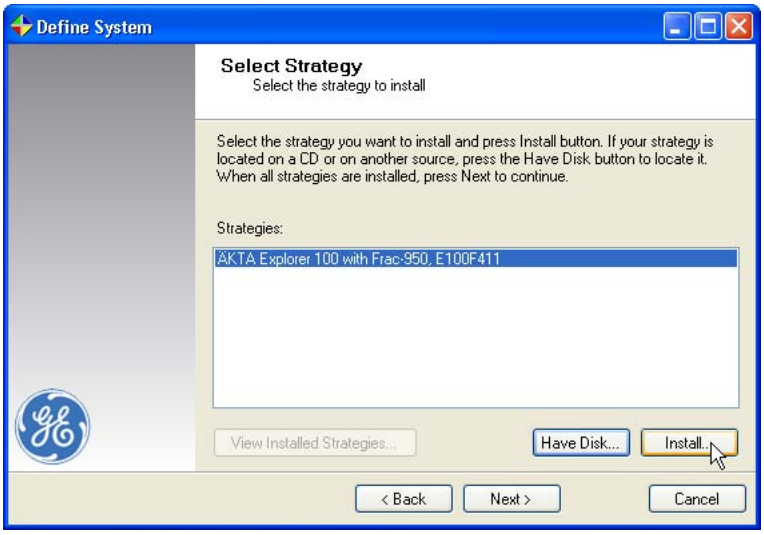
The table below describes the first step in the system definition, the ***Strategy Installation***:

Step	Action
1	Choose the ***Define System*** menu item from the GE Healthcare:UNICORN 5.31 menu. *Result:* The ***Define System*** wizard launches, showing a ***Welcome*** dialog.
2	• Click the ***Next*** button to start defining the system. *Result:* The ***Select Strategy*** dialog opens.

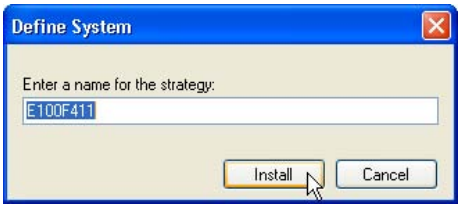


3	Click the ***Have Disk*** button. *Result:* The ***Browse For Folder*** dialog opens.

Step	Action
4	• Browse to the folder where the strategy zip-file is located. Normally, the strategy will be distributed on a separate CD. • Select the strategy file and click the ***OK*** button. *Result:* The strategy is added to the ***Strategies*** field of the ***Select Strategy*** dialog.

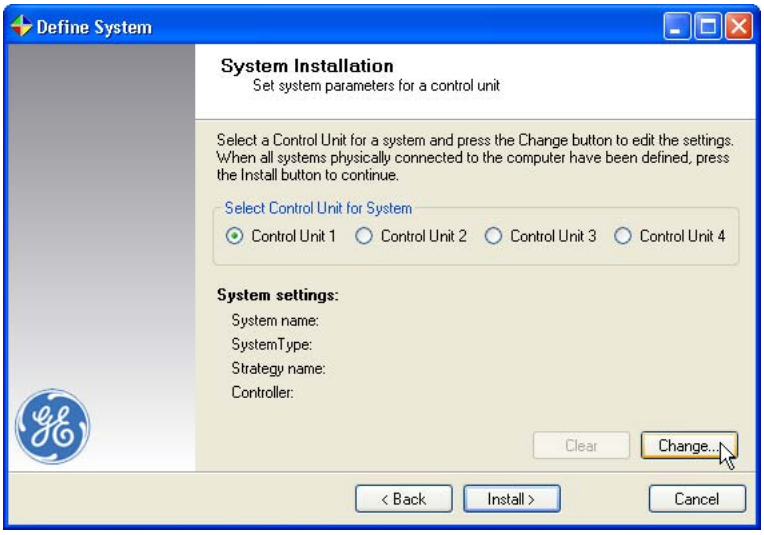


5	Click the ***Install*** button. *Result*: The ***Define System*** dialog for naming the strategy opens.



Step	Action
6	Click the ***Install*** button. *Result*: The selected strategy is installed, using the entered name. **Tip:** You can repeat this to install several strategies before you proceed with the next step. Click the ***View Installed Strategies*** button to see a list of all strategies that have been installed on the workstation.
7	Click the ***Next*** button to proceed with the System Installation.

System Installation

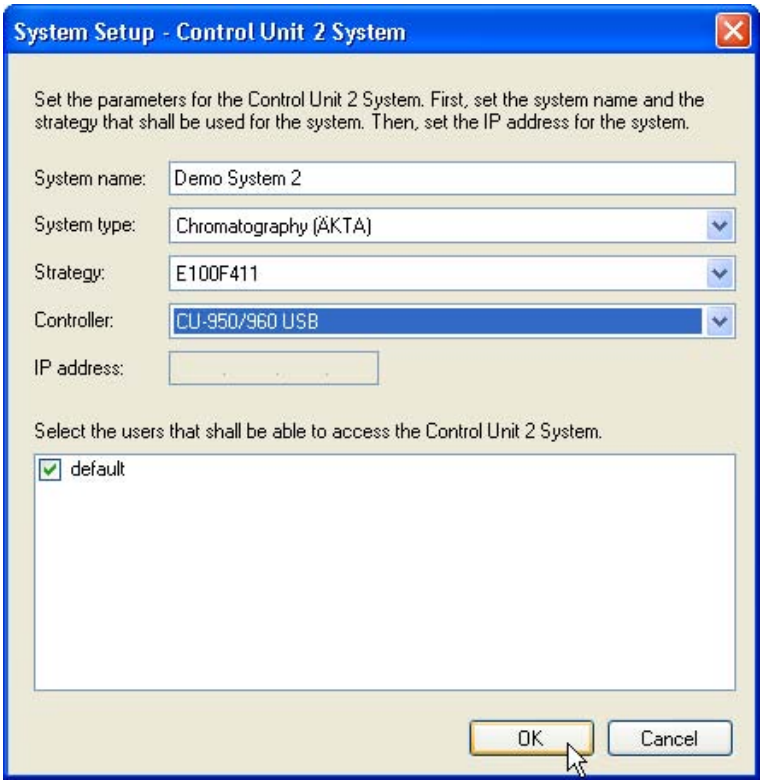


The table below describes how to define each system that is directly connected to the PC.

Step	Action
1	• Click one of the radio buttons to select a system. • Click the ***Change*** button to set up the system. *Result:* The ***System Setup*** dialog box is displayed.

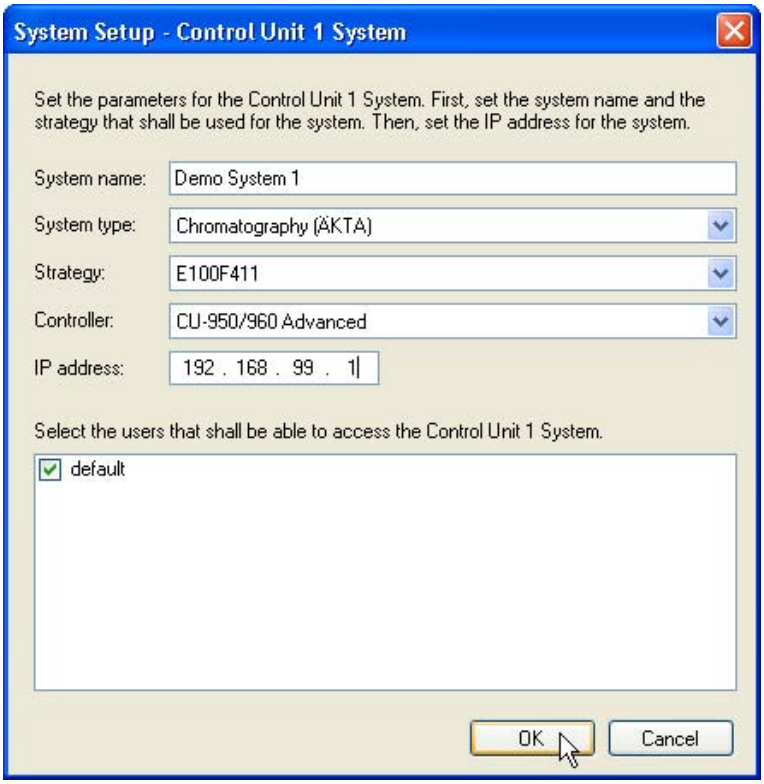
Step	Action
2	In the ***System Setup*** dialog box you set the system parameters for each system connected to the PC, one system at a time. Continue with the step that correspond to the controller(s) you will use: • CU-950/960 USB (with USB connection), see step 3 a below. • CU-950/960 Advanced (with Ethernet connection), see step 3 b below. **Note:** You can only use one type of controller for each workstation.

Step	Action
3 a	**System Setup for CU-950/960 USB**



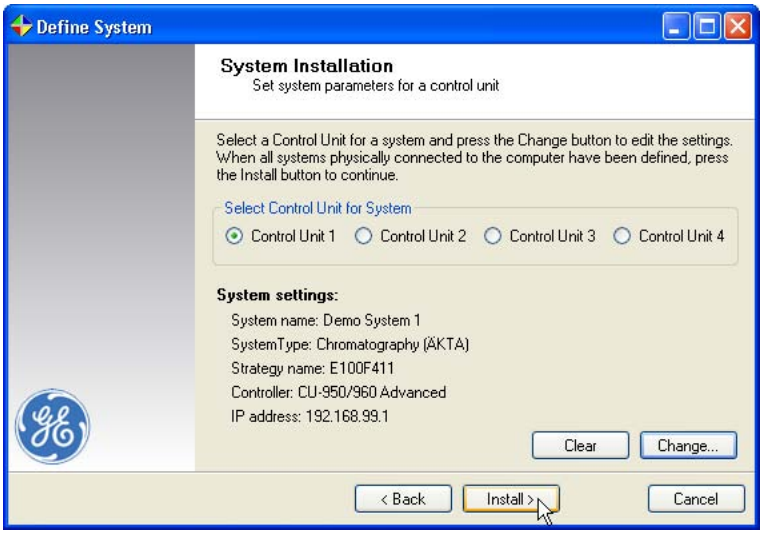
- Type a new ***System name***.
- Choose the ***System type*** and ***Strategy***.
- Choose the ***Controller*** type (USB).
- Select the users that will have access to the system. At the installation, the only available user will be the ***default*** user. You can give other users access to the system at a later stage.
- When you are finished, click ***OK***.

Step	Action
3 b	**System Setup for CU-950/960 Advanced**

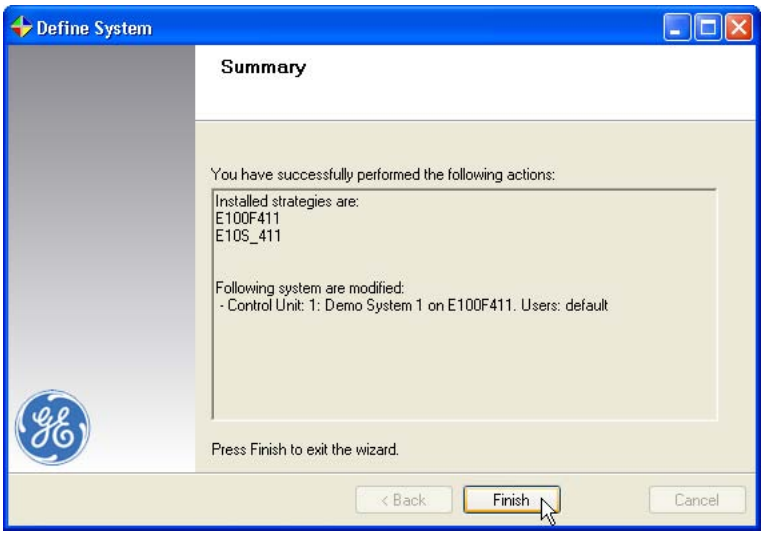


- Type a new ***System name***.
- Choose the ***System type*** and ***Strategy***.
- Choose the ***Controller*** type (Advanced).
- Enter the IP address for the controller units. This is shown on a label on the unit.
- Select the users that will have access to the system. At the installation, the only available user will be the ***default*** user. You can give other users access to the system at a later stage.
- When you are finished, click ***OK***.

Step	Action
4	The ***System Installation*** wizard dialog is displayed again showing the options you have chosen.



5	If there is more than one system to define, repeat steps 1 to 4 in this table for each system.

Step	Action
6	• Click the ***Install*** button to copy the necessary files. *Result:* The ***Summary*** dialog opens when the system definition is completed. 
7	Click the ***Finish*** button to complete the system definition. The computer will automatically be rebooted. You will need to acknowledge the reboot in a warning dialog before it is performed.

2.3.6 Windows 7 post-installation settings

Introduction

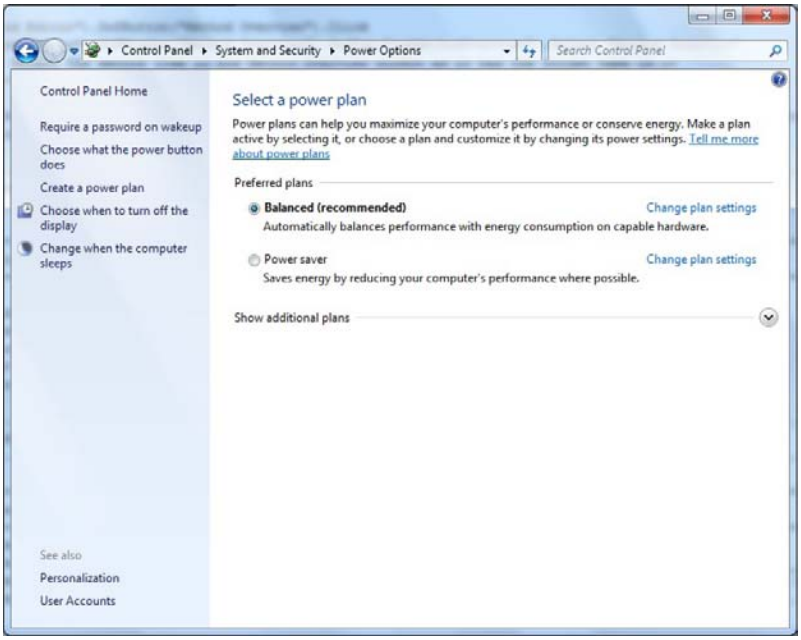
Power save settings in the default Windows 7 ***Power Options*** may interfer with the performance of UNICORN 5.31. It is essential to ensure that Windows will not put either the computer, or the computer network interface cards to sleep while a run is in progress. This section describes how to disable power save settings that are in conflict with UNICORN operations.

Disable the computer power save setting

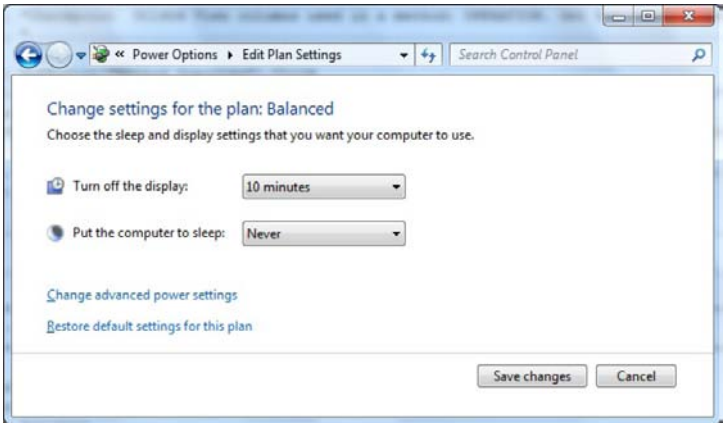
The table below describes how to disable the Windows 7 power save settings.

Step	Action
1	• Click the Windows ***Start*** button and • Choose the ***Control Panel***.
2	Click the ***Systems and Security*** heading.
3	Click the ***Power Options*** heading.

Step	Action
4	Click ***Change plan settings*** for the selected power plan.



5	• Choose the option ***Never*** for the setting ***Put the computer to sleep*** and • click the ***Save changes*** button.

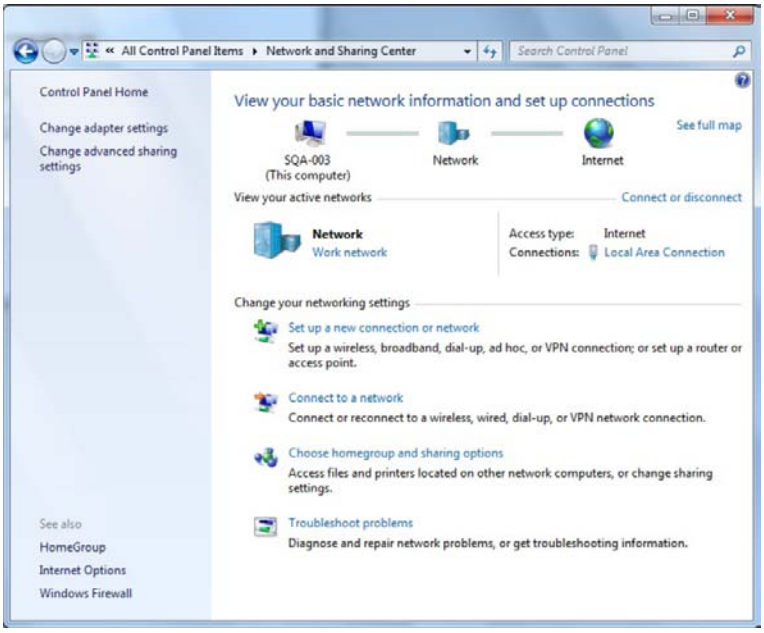


Step	Action
6	Close the ***Control Panel***.

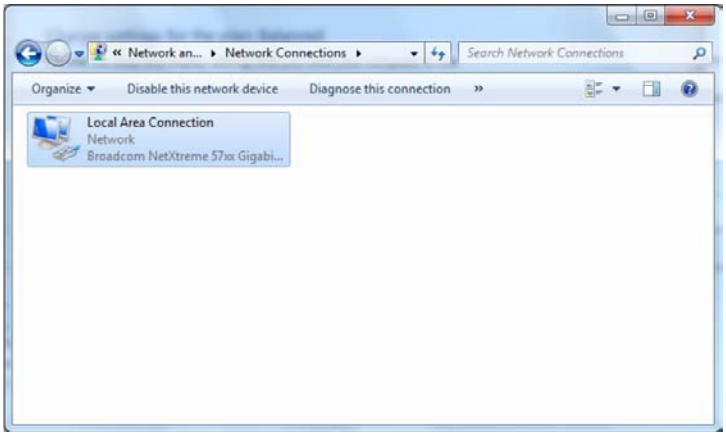
Disable the network interface card power save setting

The table below describes how to disable the network interface card power save settings.

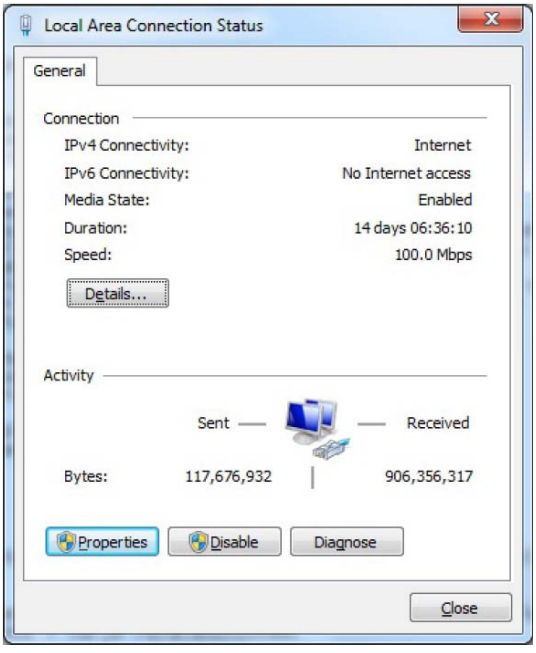
Step	Action
1	• Click the Windows ***Start*** button and • Choose the ***Control Panel***.
2	Click the ***Network and Sharing Center*** heading. *Result:* The Network and Sharing Center opens.

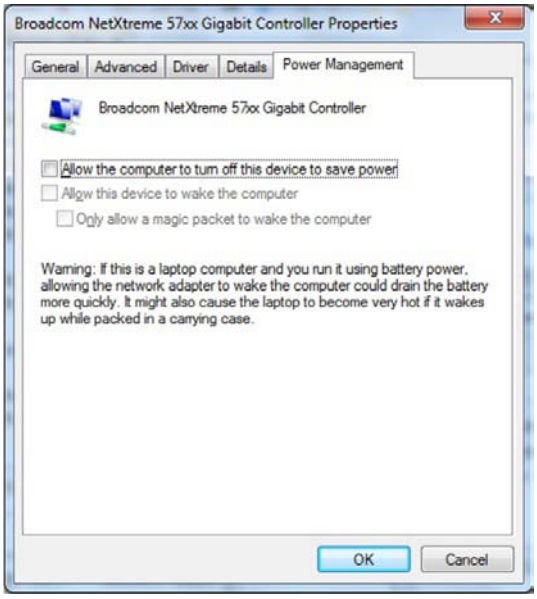


Step	Action
3	Click the ***Change adapter settings*** link. *Result:* The ***Network Connections*** dialog opens.



4	Double-click the network interface card you need to change. *Result:* The ***Network Connections*** dialog opens.

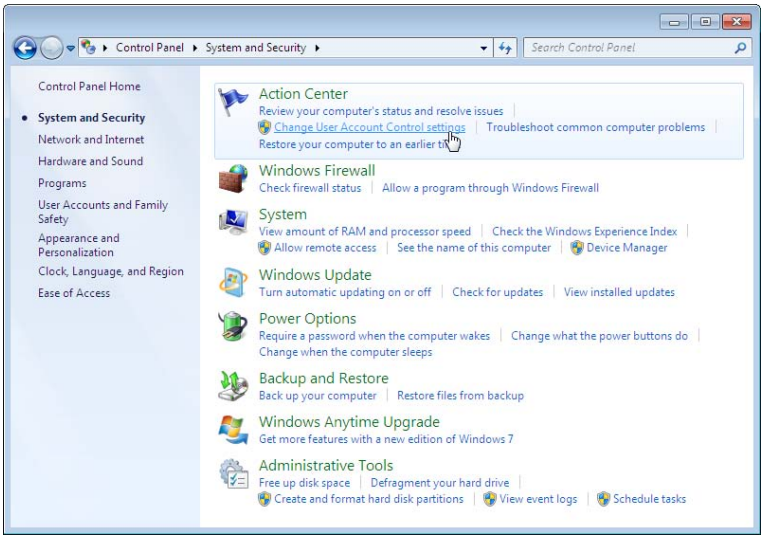


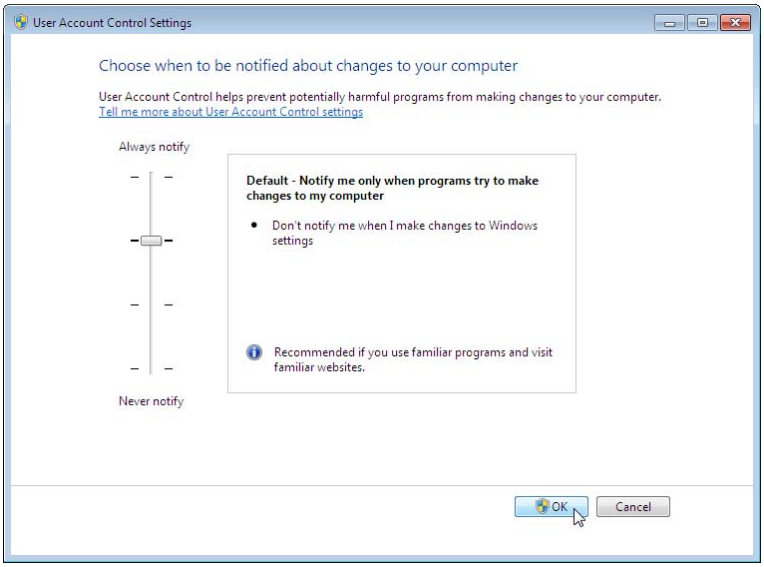
Step	Action
5	Click the ***Properties*** button. *Result:* The ***Properties*** dialog opens. 
6	• Choose the ***Power Management*** tab, • uncheck the ***Allow the computer to turn off this device to save power*** option and • click the ***OK*** button.
7	Close all dialogs.

Restore UAC

After the UNICORN installation is completed, follow the instruction below to restore the UAC setting to the default state.

Step	Action
1	• Click the Windows ***Start*** button and • Choose the ***Control Panel***.
2	Click the ***Systems and Security*** heading.
3	Under the heading ***Action Center***, click the ***Change User Account Control settings*** option.



Step	Action
4	• Click and drag the slider control up to the position ***Default - Notify me only when programs try to make changes to my computer*** and • Click the ***OK*** button. 
5	• Acknowledge the change in the pop-up dialog and • close the Control Panel

3 System connections

Introduction

This chapter describes how to manage system connections between a computer and chromatography systems.

Note: This section does not describe how to manage ÄKTAxpress system connections. For information on ÄKTAxpress system connections, see the ÄKTAxpress User Reference Manual.

In this chapter

This chapter contains these topics:

Section	See page
3.1 System connection facts	100
3.2 How to connect a system	101
3.3 Connection modes	103
3.4 How to leave and lock a system	105
3.5 How to disconnect a system	107

3.1 System connection facts

System control windows

UNICORN installed on a given computer may have up to four ***System Control*** windows. The actual number of windows is determined when the software is installed

Each window may be connected to *one* chromatography system at a time.

Note: A network installation may have more than four systems in total, but each computer in the network can establish a maximum of four connections.

Connection management

Connections are managed with these menu commands from the ***System Control***:

- ***System:Connect*** or the ***System Connect*** toolbar icon.
- ***System:Disconnect*** or the ***System Disconnect*** toolbar icon.

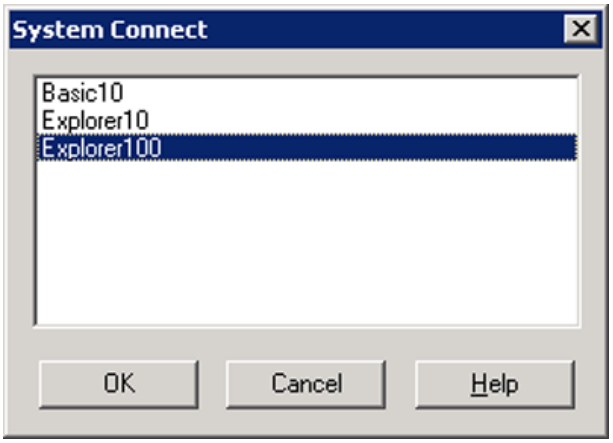
Note: Connection management is the same for stand-alone and network installations.

3.2 How to connect a system

Instruction

The table below describes how to connect the ***System Control*** module to a chromatography system.

Note: This instruction does not apply to ÄKTAxpress systems. For information on how to connect an ÄKTAxpress system, see the ÄKTAxpress User Reference Manual.

Step	Action
1	Open a ***System Control*** window that is not currently in use. It is identified by the ***Not connected*** text in the status bar.
2	Select ***System:Connect*** or click the ***System Connect*** toolbar icon.  *Result*: The System Connect dialog box is displayed.
3	The ***System Connect*** dialog box lists the systems to which you have access. Select a system to which you want to connect and click ***OK***.  **Note:** See additional information about remote and local stations below.

If you connect from a remote station

If you connect from a remote station to a chromatography system you should be aware of the following:

- The local station (the computer physically connected to the system) must be logged on to the network.
- The UNICORN drivers must be running on the local station.
- The UNICORN program does *not* have to be running on the local station.

If you connect from a local station

If you connect from a local station to a chromatography system physically connected to the local station, you do not have to log on to the network. Be aware though, that there are some drawbacks if you do not log on:

- Files stored on network drives will not be accessible.
- UNICORN is placed in an "error" state which is not ideal. Global files such as the user settings file (`musers30.mpm`) etc. are stored on the network. Any changes made to these files while you are not logged on will apply only locally and will be lost the next time you log on to the network to use UNICORN.
- For runs performed in this stand-alone mode, the result file cannot be saved on a network drive. If the file is directed to a network drive it will instead be saved in the ***Failed*** folder on the local station.

3.3 Connection modes

Types of connections

The user can establish two different types of connections to a chromatography system:

- Control mode connection: The user is able to actively control the system.
- View mode connection: The user can monitor the system activity but cannot control the system.

Several simultaneous connections can be established to one system, but only one may be in control mode. The other connections are in view mode.

Status bar information and possible actions

The ***System Control*** module displays information in the status bar regarding the connection mode. The table below explains the status bar text and the possible actions the user can take:

Status bar text	Connection mode	Possible actions
(nothing)	Not connected	To establish a connection, either • click the ***System Connection*** icon *or* • select ***System:Connect***.
Controlled by: <user>	Control mode	To leave the system but retain the connection with the ***System Control*** module, either • click ***Disconnect*** from the ***System*** icon *or* • select ***System:Disconnect***. **Note:** You may leave the system locked or unlocked.
Controlled by: <other user>	View mode The indicated user has a control mode connection.	None. Even if you click the ***System Connection*** icon it has no effect.

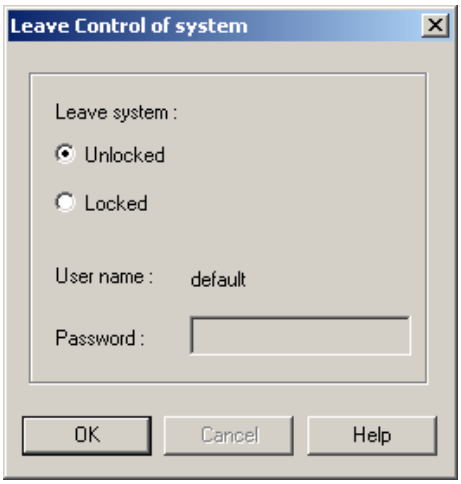
Status bar text	Connection mode	Possible actions
Locked by: <other user>	View mode The indicated user has left the system in a locked state.	Click the ***System Connection*** icon to establish a control mode connection. You must supply a password, either • the locking password *or* • your logon password (if you have ***Unlock locked systems*** access). **Note:** The password is case sensitive.
System is available	View mode A user has left the system in an unlocked state.	Click the ***System Connection*** icon to establish a control mode connection.

3.4 How to leave and lock a system

Instruction

Follow the steps in the table below to leave and lock a running system or an End state system, which is connected with a control mode connection:

Step	Action
1	• Click the ***Leave control of system*** icon  *- or -* • Select ***System:Leave Control***. *Result*: The ***Leave control of system*** dialog box is displayed.

Step	Action
2	

- Select how you want to leave the system:
  - The ***Unlocked*** option leaves the system unlocked. Any other user may establish a control mode connection to the system. Use this option if you do not intend to use the system in the near future.
  - The ***Locked*** option locks the system with the password specified in the dialog box. A control mode connection can only be established by providing the correct password. This password is independent of the user's logon password. A locked system can also be unlocked with the logon password for a user with ***Unlock locked systems*** access. This access item should be restricted to a small number of users to prevent indiscriminate unlocking of locked systems.
- Click ***OK***.

Leave and lock a Scouting run or MethodQueue run

If you leave and lock a ***Scouting*** run or a ***MethodQueue*** run it is not possible to establish a control mode connection from another computer.

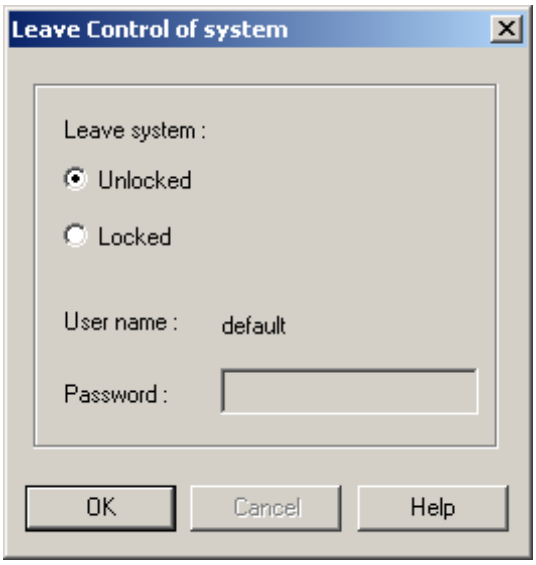
3.5 How to disconnect a system

Instruction

Follow the steps in the table to disconnect a chromatography system from a ***System Control*** module:

Step	Action
1	• Click the ***Disconnect from system*** icon  *or* • select ***System:Disconnect***. *Result*: • If you disconnected from a *view* mode connection, you are now disconnected. • If you disconnected from a *control* mode connection, the ***Leave control of system*** dialog box is displayed. Proceed to step 2 below. **Note:** You can disconnect a system during a run and the run will still continue. It is not recommended to do this without locking the system since this can leave a run on the system with no responsible user. You cannot however disconnect from ***Scouting*** or ***MethodQueue*** runs.

Step	Action
2	This step is only relevant if you disconnect from a *control* mode connection.



- Select how you want to leave the system:
  - The ***Unlocked*** option leaves the system unlocked. Any other user may establish a control mode connection to the system. Use this option if you do not intend to use the system in the near future.
  - The ***Locked*** option locks the system with the password specified in the dialog box. A control mode connection can only be established by providing the correct password. This password is independent of the user's logon password. A locked system can also be unlocked with the logon password for a user with ***Unlock locked systems*** access. This access item should be restricted to a small number of users to prevent indiscriminate unlocking of locked systems.
- Click ***OK***.

If you log off or quit a system

If you log off or quit UNICORN, it will automatically disconnect all connected systems and the ***Leave control*** dialog box will be displayed for each system. Systems that are disconnected in this way will be re-connected automatically when you log on to UNICORN again.

4 Calibration

Introduction

This chapter introduces some calibration concepts and describes how to calibrate monitors for ÄKTAdesign systems.

Calibration of monitors is important for the monitors to display correct results.

In this chapter

This chapter contains these topics:

Section	See page
4.1 Calibration facts	110
4.2 How to calibrate monitors for ÄKTAdesign systems	112

4.1 Calibration facts

Introduction

Certain system monitors, mainly pH monitors, need to be calibrated regularly for correct results.

To calibrate monitors from different manufacturers from UNICORN

Most monitors can be calibrated from UNICORN to convert monitor signals to appropriate units for display. For monitors supplied by manufacturers other than GE Healthcare, and for some GE Healthcare monitors, calibration in UNICORN should be performed each time the monitor itself is calibrated.

For most monitors supplied by GE Healthcare, calibration from UNICORN also performs a true calibration of the monitor, adjusting the signal-response level in the monitor.

Calibration access

Monitors can only be calibrated by users with ***Calibrate/Tune*** access.

Calibrate system modules in the System Control

Calibrations made directly on system modules are logged only in the ***System Control*** logbook and *not* in the ***Calibration*** page of ***Documentation*** dialog box (***Evaluation*** module) or in the ***Audit trail***.

Problem: This means that the ***Calibration*** page and ***Audit trail*** information might not be up to date.

Solution: Therefore, always calibrate modules using the UNICORN calibration functions in the ***System Control*** module when possible.

Calibration methods

Different calibration methods are used depending on the type of monitor and system:

- one-point measurement
- two-point measurement

- continuous measurement.

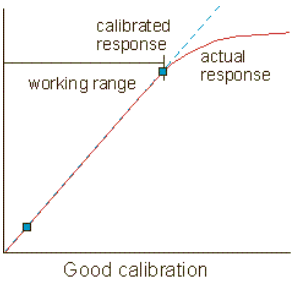
Note: The calibration method depends on the routines established in the laboratory or process department.

One-point calibration

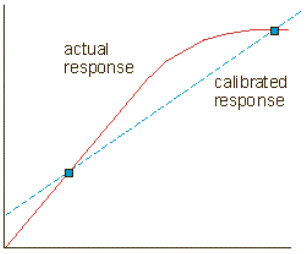
One-point calibration is based on measurements taken at one reference point. The monitor will be calibrated based on an assumed linear response between the reference point and zero.

Two-point calibration

Two-point calibration is based on measurements at two reference points. The monitor will be calibrated assuming a linear response between the two reference values. It is important that monitors are calibrated in the measuring range for which they will be used, particularly when the response is not linear over the whole operating range of the monitor (see the figures below).



Good calibration



Poor calibration

Note: For a monitor with a non-linear response, make sure the reference points are within a linear working range.

Continuous calibration

Continuous calibration is based on a value accumulated during a given time. This kind of calibration applies to the sample pump in ÄKTAdesign systems.

4.2 How to calibrate monitors for ÄKTAdesign systems

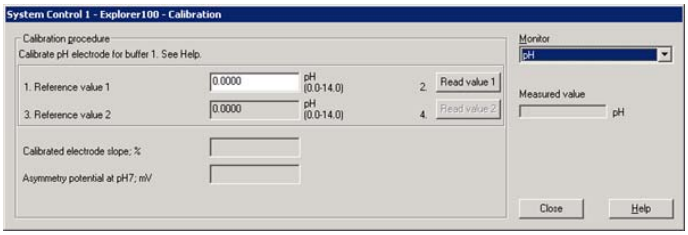
How to calibrate monitors

The table below describes how to calibrate the monitors for ÄKTAdesign systems:

Step	Action
1	Select ***System:Calibrate*** in the ***System Control*** module. *Result*: The ***Calibration*** dialog box is opened.
2	Select a monitor in the ***Monitor*** drop-down box and perform the procedures as described in the dialog box.
3	Repeat step 2 for each monitor type.
4	Click the ***Close*** button when the calibrations have been made.

How to calibrate a pH monitor

Some ÄKTAdesign systems have a pH monitor to allow online pH measurements. Below is an illustration of the dialog box for pH calibration:



Note: Calibration can be performed with the electrode either within or outside the flow cell.

Instruction

The table below describes how to calibrate a pH monitor with the electrode mounted in the flow cell:

Step	Action
1	• Attach the first pH reference solution, for example pH 7.0, to ***Inlet A11*** on the system. • Attach the second reference solution, for example pH 4.0, to ***Inlet B1***.

Step	Action
2	In the ***System Control*** module, select ***Manual:Pump***. *Result*: The ***Instructions*** dialog box is opened.
3	• Select ***Pump:PumpWash Explorer*** in the ***Instructions*** field. • In the parameters field, select ***Inlet A11***. • Click the ***Execute*** button. *Result*: The pump and inlet tubing will now be filled with the first reference solution. Wait until the ***PumpWash*** is finished before you continue to the next step.
4	• In the ***Instructions*** field, Select ***Pump:Flow***. • In the ***FlowRate*** box, insert the flow rate that you will use later during your run. • Click the ***Execute*** button. Allow at least 35 ml of reference buffer to pass through the cell, during which time the pH should stabilize.
5	• Select ***System:Calibrate*** from the ***System Control*** menu. • In the ***Monitor*** drop-down box, select ***pH***. **Note:** The ***Measured value*** field shows the actual reading according to the previous calibration. This value may be incorrect and does not affect the current calibration.
6	When the pH is stable, do the following: • Enter the known pH of the reference solution in the field ***Reference value 1*** • Click the ***Read Value 1*** button.

Step	Action
7	Switch to the second reference solution this way: • Select ***Manual:Pump***. • Select the instruction ***Pump:Gradient*** • In the ***Parameters*** field, set target to ***100%*** B after ***0*** minutes. • Click the ***Execute*** button. • Select the instruction ***Pump:PumpWashExplorer***. • In the ***Parameters*** field, set ***Inlet B1*** to ***ON***. • Click the ***Execute*** button. *Result*: Do not continue to the next step until the ***PumpWash*** is finished.
8	When the pH is stable, do the following: • In the ***Calibration*** dialog box, enter the known pH of the reference solution in the field ***Reference value 2*** • Click the ***Read Value 2*** button. • Click the ***Close*** button. • Click the ***End*** button to stop the flow rate.
9	After the calibration, the values are automatically entered into the ***Calibrated electrode slope*** and ***Asymmetry potential at pH 7*** fields. **Note:** If you calibrate with the electrode outside the flow cell, do *not* remove the electrode from ***Solution 1*** until the ***Read Value 2*** button has become available (when the button text has turned from grey to black).

5 Security

Introduction

This chapter presents the security concepts and features of a UNICORN installation. The concepts and features are good to know since they are also used in other parts of this manual.

In this chapter

The table below describes the contents of this chapter:

Section	See page
5.1 Access security	116
5.2 Connection security	117
5.3 Data security	118
5.4 How to prevent accidental shut-down	124
5.5 The Options dialog box	125

5.1 Access security

Purpose

The purpose of access security is to avoid unauthorized user access to the UNICORN system.

Passwords to restrict access

User access is often restricted by means of a password. There are some password rules that are important keep in mind:

- The password must have a minimum number of characters. The minimum length is defined when UNICORN is installed, see *Section 2.3.2 How to install UNICORN, on page 44* and *Section 2.3.3 How to install UNICORN for ÄKTAxpress, on page 64*.
- The password should be changed regularly if access security is very important. See *Section 6.3.5 How to change user passwords and user attributes, on page 184*.

Access groups

Each user is assigned to an access group that defines

- the operations that the user can perform
- the folders the user is allowed to access.

Access groups are described in *Section 6.3.4 How to assign user properties, on page 175*.

Delete default user

When you install UNICORN, a default user with full access rights is automatically created. For system security reasons the default user must be deleted when you have created the site-specific users.

Maintain system security

To maintain system security, only the system administrator should be allowed to carry out administrative routines such as user definition and system definition.

5.2 Connection security

Purpose

The purpose of connection security is to avoid conflicts regarding system control, so that only one user at a time controls the chromatography system.

Control mode and View mode connections

Two kinds of connection modes can be established with the UNICORN system:

- Control mode connection: The user has full system control, that is control of the chromatography system.
- View mode connection: The user can view the process but not control it.

To prevent conflicts, the system can have only one control mode connection at a time, that is only one user at a time can control the process.

How to lock a system

To prevent other users from establishing a control mode connection to the system, a user should

- establish a view mode connection to the system
- lock the system with a password. This password can be different from the user's logon password.

Note: If a user leaves the system unlocked in a view mode connection, any other user may establish a control mode connection to the system.

When to lock a system

It is recommended that systems are always locked when a user leaves the system. When the system is controlled and locked, the responsible user is identified in the ***System Control*** window for view mode connections. A system which is left unlocked with no control mode connection has no identified responsible user.

Systems may be locked even when they are idle, to allow users to reserve a system for later use.

5.3 Data security

Introduction

Data security prevents that results of a run are lost due to failure in the network communication or the local station.

In this section

The table below describes the contents of this section:

Section	See page
5.3.1 Network communication failure - remote station	119
5.3.2 Network communication failure - local station	121
5.3.3 Local station failure	122

5.3.1 Network communication failure - remote station

If the network communication fails

If the network communication fails while a method is running, the remote station will lose control of the system. Then the following will happen:

- The run continues under the control of the local station.
- Results that were destined for network drives cannot be saved in their correct folders. Instead, the results are saved in the ***Failed*** folder on the local station.

Failed folder and result file

Failed folder path

If `C:` is the UNICORN installation drive, the path to the ***Failed*** folder is `C:\Unicorn\Local\Fil\Failed`. There the results can be retrieved when the run is completed.

Result file name

The name of the result file will be the same as the original result file name. Files with the same name base are distinguished by an incremental serial number, in the same way as result files in any other folder.

How to retrieve the results from the Failed folder

Follow the instructions in the table below to retrieve the results from the ***Failed*** folder:

Step	Action
1	Start UNICORN (unless already started) on the local station connected to the system that was run.
2	Log on as an authorized user with access to the ***Failed*** folder.
3	• Reestablish the network communication. • Move the result file from the ***Failed*** folder to a suitable location on the network server where it is accessible from remote stations.

Policies for access to the Failed folder

The system administrator may choose one of the following policies regarding access to the ***Failed*** folder:

- To grant access to the ***Failed*** folder to all users
- To grant access to the ***Failed*** folder only to one or a few users

In either case, it is sufficient to grant access to `C:\Unicorn\Local\Fil\Failed` since this is the path to the ***Failed*** folder on all local stations.

Access to all users

If the system administrator grants access to the ***Failed*** folder to all users, it will have the following implications:

- The individual user gets the responsibility to retrieve his or her own result files and to delete old files from the ***Failed*** folder.
- Any user will be able to examine, copy, move and delete the other users' results in the ***Failed*** folder.
- The ***Failed*** folder can be used to temporarily store methods and results from runs performed from the local station when the network is not running.

Access to a few users

If the system administrator grants access to the ***Failed*** folder to only one or a few users, it will have the following implications:

- One or a few users will have the responsibility for retrieving the result files and deleting the old files from the ***Failed*** folder.
- The user(s) with access to the ***Failed*** folder should also have access to other users' home folders to be able to copy or move result files to suitable destinations.

Note: This policy should be used if the installation requires restricted access to users' result files.

5.3.2 Network communication failure - local station

In this section

This section describes what happens when the network communication fails between a local station and a CU-950 Advanced or CU-960 Advanced control unit during a method run.

If the network communication fails

The table below describes what happens when these conditions are fulfilled:

- A CU-950/CU-960 Advanced controller (with a memory card) is used
- Data recovery = ***ON***
- Method behaviour = ***CONTINUE***
  Note: Data recovery and Method behaviour is described in *Section 7.6 CU-950/CU-960 settings, on page 200*.
- The network communication is lost between the local station and the CU-950/CU-960.

Step	Action
1	• The run continues under the control of CU-950/CU-960 during the communication loss. • The run data is saved in the CU-950/CU-960 memory card.
2	When communication is reestablished, • UNICORN requests the missing data from the CU-950/CU-960 • the missing data is uploaded to the local station • during the upload the message ***Uploading*** is displayed under ***Instruments*** in the ***Run Data*** pane of the ***System Control*** module.
3	The run continues as normal

5.3.3 Local station failure

In this section

This section describes what happens if a local station fails during a method run. The run may continue but the results generated after the failure cannot be saved unless a CU-950 Advanced or CU-960 Advanced controller is used.

Systems with CU-950/CU-960 Advanced controller

The table below describes what happens when these conditions are fulfilled:

- A CU-950/CU-960 Advanced controller (with a memory card) is used
- Data recovery = ***ON***
- Method behaviour = ***CONTINUE***
  Note: Data recovery and Method behaviour is described in *Section 7.6 CU-950/CU-960 settings, on page 200*.
- The communication is lost between the local station and the CU-950/CU-960 due to a computer crash.

Step	Action
1	• The run continues under the control of CU-950/CU-960 during the communication loss. • The run data is saved in the CU-950/CU-960 memory card.
2	When the local station is up and running and the connection between the local station and the CU-950/CU-960 has been reestablished, • UNICORN uploads backup files from the hard drive of the local station • UNICORN requests the missing data from the CU-950/CU-960 • the missing data is uploaded to the local station • during the upload the message ***Uploading*** is displayed under ***Instruments*** in the ***Run Data*** pane of the ***System Control*** module.
3	The run continues as normal

Systems without CU-950/CU-960 Advanced controller

When the local station is restarted after the failure, the temporary result file will be transferred to either of the following locations:

- the original result file destination, usually on a network drive

or

- the ***Failed*** folder, if the original destination is on a network drive which is not available. If `C:` is the UNICORN installation drive, the path to the ***Failed*** folder is `C:\Unicorn\Local\Fil\Failed`.

The result file will contain the results of the run up to and including the last auto save time (see explanation below) before the failure. Results after this time will be lost.

Auto save feature

An auto save feature saves a temporary result file on the local station every five minutes during runs, see *Section 6.2.1 System definitions, on page 135*.

If the local station is not logged on

If a run is performed on a local station which is not logged on to the network, the result file cannot be saved on a network drive. Instead the results will be saved in the ***Failed*** folder on the local station.

5.4 How to prevent accidental shut-down

How an accidental shut-down could occur

Chromatography systems may be controlled without running the user interface modules. This is possible in the following cases:

- Network installation: If a system is controlled from a remote station without starting UNICORN on the local station.
- Stand-alone installation: If a user quits UNICORN after starting a run.

In both these cases, it is *not* apparent from the desktop that the UNICORN control software is actually running. Therefore there is a risk that someone shuts down the computer in the belief that it is not in use.

How to prevent a shut-down

Make sure you follow the recommendations below to prevent an accidental shut-down of a control station (which controls a UNICORN run):

- Do not quit UNICORN if you are controlling a system.
- Do not turn off local station computers in a network installation.
- Start the UNICORN program on all local stations in a network installation, if possible, and establish a view mode connection as an indication that a connected system might be running.

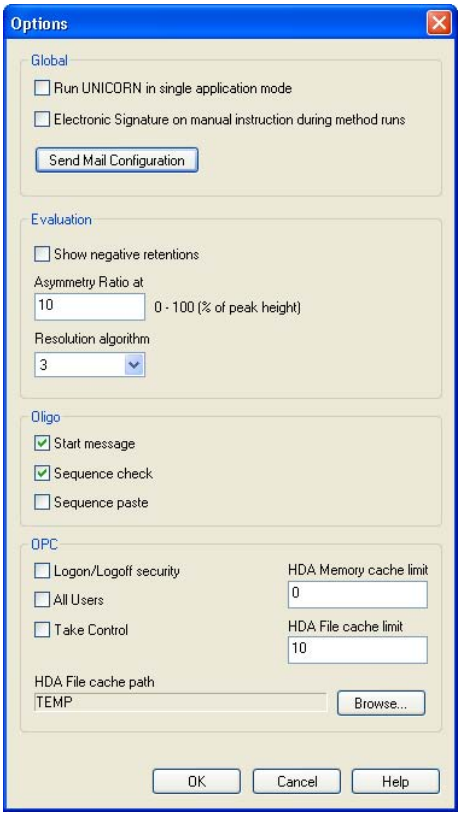
5.5 The Options dialog box

Introduction

This section describes the Options dialog box in the UNICORN Manager.

How to open the dialog box

In the UNICORN Manager, choose ***Administration:Options...*** to open the Options dialog box.



There are four fields in the dialog box which are described individually below.

The Global field

The table below describes the commands of the Global field.

Command name	Function
Run UNICORN in single application mode	Select the check box to activate UNICORN single application mode on the computer. **Explanation** Single application mode means that UNICORN will be the only application available when it is running. The setting is done on a per computer basis and will apply to everyone who starts UNICORN on the specific computer. To achieve single application mode, UNICORN is started in a separate desktop. When UNICORN is terminated, Windows switches back to the original desktop.
Electronic Signature on manual instruction during method runs	Select the check box to enable electronic signatures for all manual instructions entered during an ongoing method run.
Send Mail Configuration	Click the ***Send Mail Configuration*** button to configure the settings for automated notification mails sent from UNICORN to the system administrator. This function is described further below.

The Evaluation field

The table below describes the commands of the Evaluation field.

Command name	Function
Show negative retentions	Select the check box to show negative retentions in the Evaluation module. This means that curve data before the injection point will be displayed, that is before time or volume is zero. Deselect it to hide curve data before the injection point.
Asymmetry ratio at	The value specifies the height, in percent of peak height, where the asymmetry calculation is performed. See Appendix B3 of the UNICORN User Reference Manual for more information.

Command name	Function
Resolution algorithm	Select the resolution algorithm to be used. See Appendix B3 of the UNICORN User Reference Manual for more information.

The Oligo field

The table below describes the function of each checkbox when it is selected.
Note: These functions are only valid for oligosynthesis systems.

Command name	Function
Start message	Inserts a start message in the method
Sequence check	Checks a sequence for errors
Sequence paste	Allows paste of sequence characters from another program

The OPC field

The table below describes the commands of the OPC field:

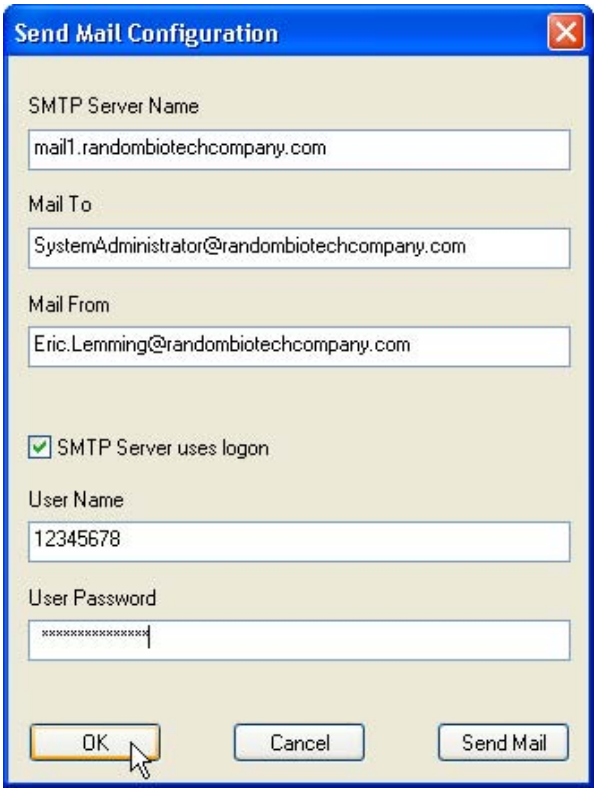
Command name	Function
Logon/Logoff security	Enables the OPC security interface
All Users	Displays all users in Data Access and Historical Data Access
Take Control	Automatically tries to gain control of the system when OPC starts
HDA Memory cache limit	Limits Historical Data Access in-memory cache to the specified number of bytes. Range: 0 - 1 000 000 000 [bytes] 1 - 100 => 100 [bytes], minimum cache size 0 = unlimited cache size

Command name	Function
HDA File cache limit	Indicates maximum number of result files in cache. Range: 0 - 100 0 = cache not used
HDA File cache path	The folder where cached result files are stored

Mail configuration

The table below describes how to set up an e-mail account for automated system messages:

Step	Action
1	Click the ***Send Mail Configuration*** button. *Result:* The ***Send Mail Configuration*** dialog opens.



2	Enter the following information: • ***SMTP Server Name*** (The mail server used for outbound e-mail traffic) • ***Mail To*** (The e-mail address to the system administrator) • ***Mail From*** (The return e-mail address of the user)

Step	Action
3	If the SMTP server requires a logon, select the check box and • enter the ***User Name*** used for logon and • the ***User Password***.
4	Verify that the mail configuration is correct by clicking the ***Send Mail*** button to generate a test message.
5	Click the ***OK*** button to save the configuration and close the dialog.

6 Administration

Introduction

This chapter describes the administration aspects of a UNICORN installation, for example how to create system definitions and how to assign different access levels to the users.

In this chapter

This chapter contains these sections:

Section	See page
6.1 Administration overview	132
6.2 System administration	134
6.3 User Administration	161

6.1 Administration overview

Administration areas

The table below describes the three main areas of UNICORN administration:

Area	Concerns
System administration	• maintenance of software aspects of UNICORN, including - definition of connected systems, see *Section 6.2.1 System definitions, on page 135*. - monitoring of system usage (audit trails), see *Section 6.2.2 Audit trails, on page 146*. • routine monitor calibration, see *Chapter 4 Calibration, on page 109*.
User administration	authorization of access to the system, see *Section 6.3 User Administration, on page 161*. **Note:** The responsible should be one person or a small group, at least in larger installations.
Network administration	maintenance of the network functions relevant to UNICORN, see *Chapter 1 Network setup, on page 5*. **Note:** In a network installation, this is normally carried out by the computer staff responsible for the company's network.

Actions before the UNICORN program can be used

When UNICORN has been installed, the administrator must perform the actions in this table before other users can use the program:

Step	Action
1	Set up system definitions for the chromatography systems, see *Section 6.2.1 System definitions, on page 135*.
2	Define new users with home folders, access groups and access profiles, see *Section 6.3 User Administration, on page 161*.

Note: The above actions can be performed from *any* station in a network installation. The administrator must be logged on to the network from the workstation so that the changes apply globally throughout the network.

6.2 System administration

Introduction

This section describes mainly

- how to create and edit system definitions
- how to view, edit and save log files of the UNICORN system activity.
- how to back up and restore the system definitions.

In this section

This table describes the contents of this section:

Section	See page
6.2.1 System definitions	135
6.2.2 Audit trails	146
6.2.3 How to back up and restore system definitions	157

6.2.1 System definitions

General guidelines

- System definitions are used to set up the systems in a UNICORN installation. The definitions must be made for each new system that is installed.
- In a network installation, the definitions must be performed for each local computer in the network.

Note: Access rights to a system are controlled at the user administration level, see *Section 6.3 User Administration, on page 161*.

Important!

The UNICORN computer name

- The computer name in the UNICORN software *must* be the same as the Windows computer name. The Windows computer name is therefore automatically filled in as the UNICORN computer name when you create a new system definition.
- Subsequently, if the Windows computer name for some reason is changed after the UNICORN installation, you have to manually change the computer name in UNICORN.

How to change the computer name

The table below describes how to determine the Windows computer name and change the UNICORN computer name accordingly:

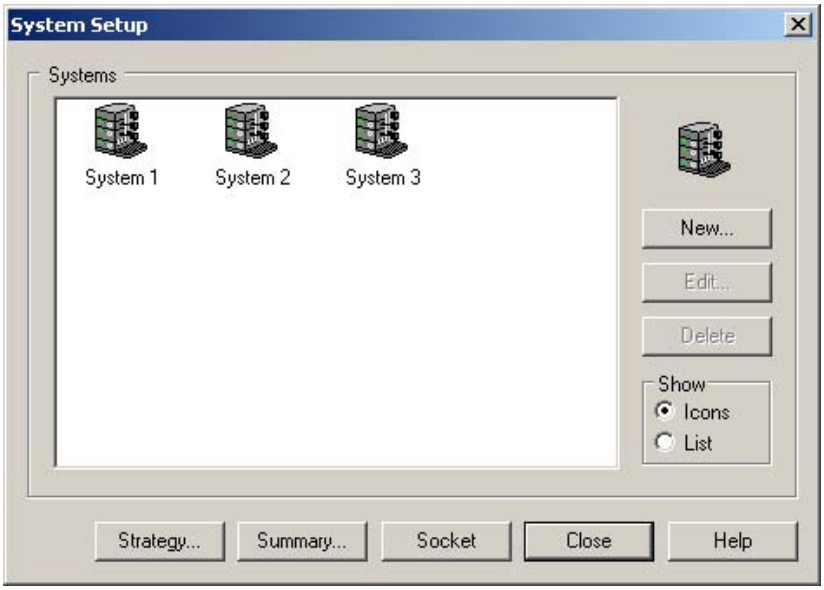
Step	Action
1	• Open Windows ***Control Panel*** and double-click the ***System*** icon. • Look for an item called ***Computer Name***. **Note:** Depending on your Windows version, you might have to click a tab to find the computer name. • Take a note of the computer name and click the ***Cancel*** button.
2	Start UNICORN and choose ***Administration:System Setup*** in the ***UNICORN Manager***. *Result*: The ***System Setup*** dialog box is displayed.
3	• Select the system and click the ***Edit*** button. • Check that ***Computer name*** is the same as the Windows computer name. If not, change the UNICORN computer name.

Step	Action
4	Click ***OK*** and then the ***Close*** button.

Possible actions in the System Setup dialog box

Systems are edited in the ***System Setup*** dialog box in the ***UNICORN Manager***.

- Choose ***Administration:System setup*** in the ***UNICORN Manager*** to open the ***System Setup*** dialog box, see illustration below.
  Note: To use this menu command, you must have ***Audit trail/System setup*** access, see *Section 6.3.2 Access items, on page 166*.



Possible actions

The table below describes the actions you can perform in the ***System Setup*** dialog box. Each action is described further on in this section.

Note: You need the UNICORN installation CD to perform the actions ***New*** and ***Delete***.

If you want to...	then click the button
create a new system definition	***New***
edit a system definition	***Edit***

If you want to...	then click the button
delete a system definition	***Delete***
delete a strategy	***Strategy***
view or print a system summary	***Summary***
use socket communication	***Socket***
view installed systems as icons	***Icons***
view installed systems in a list	***List***

Note: The ***Socket*** button is described in *Section 1.2 Network environment, on page 8*.

How to create a new system definition

The table below describes how to create a new system definition:

Note: When the system definition has been created, remember to grant access to the system to the appropriate users.

Step	Action
1	• Insert the UNICORN CD in the CD-ROM drive. *Result:* The Setup wizard starts and displays the ***Welcome*** screen. • Click the ***Next*** button.
2	The ***Select Components*** screen is displayed. • Make sure that the ***System Installation*** option is selected. You should deselect the other check boxes unless you want to install other components. • Click the ***Next*** button.

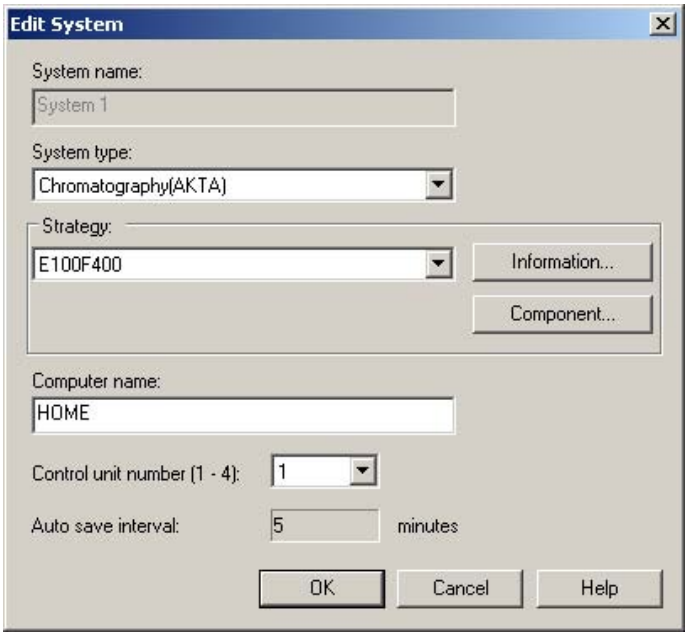
Step	Action
3	The ***Program Options*** screen is displayed. • Specify the number of ***System Control Windows*** you want to be available, normally the number of instruments that will be simultaneously connected to the PC. Maximum value is - 1 for CU-950/CU-960 USB - 4 for CU-950/CU-960 Advanced. • Click the ***Next*** button.
4	The ***Start Copying Files*** screen is displayed. • Click the ***Next*** button.
5	The ***System installation*** screen is displayed. • Go to *Section 2.3.2 How to install UNICORN, on page 44* for further instructions.

How to edit a system definition

The table below describes how to edit the parameters of an existing system definition:

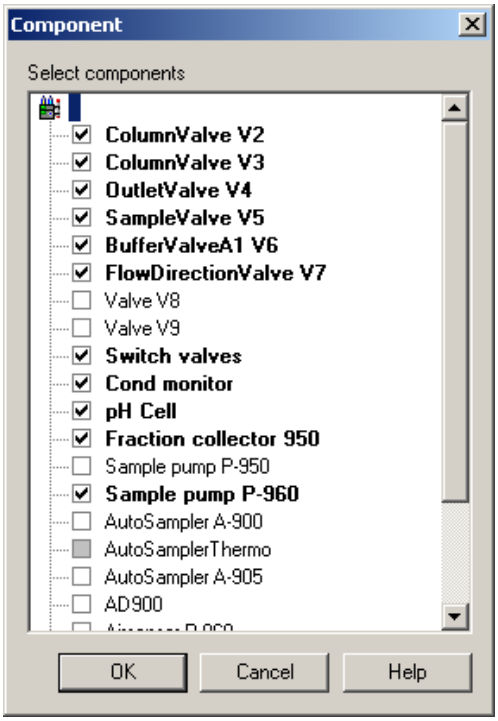
Step	Action
1	Select ***Administration:System setup*** in the ***UNICORN Manager***. *Result*: The ***System Setup*** dialog box is displayed.

Step	Action
2	Select the system in the ***System Setup*** dialog box and click the ***Edit*** button. *Result*: The ***Edit System*** dialog box is displayed.



Step	Action
3	The fields of the dialog box are described below. **Note:** Any other changes than ***Strategy***, ***Computer name*** and ***Component...*** require that you run the full system setup procedure. See *Section 2.3.5 Define a system after UNICORN 5.31 is installed, on page 84*. • ***System name*** Type the system name. Names can be up to 30 characters long. **Note:** The system name can be set only when a new connection is defined. It cannot be edited later since user access rights are linked directly to the system name. • ***System type*** Select a system type, either ***Chromatography***, ***Oligo*** or ***Xpress***. • ***Strategy*** - Select a strategy for the system from the drop-down list. - Click the ***Information*** button to display information about the selected strategy. - The ***Component*** button is described in step 4 below. **Note:** Available strategies are determined when UNICORN is installed (see *Section 2.3 Software Installation, on page 40*). If there are several strategies installed, make sure that the selected strategy is appropriate for the system. *Step continued below.*

Step	Action
3, cont.	• ***Computer name*** The Computer name should be the same as the Windows name of the computer that the system is connected to. Normally this is the local computer. • ***Control unit number*** Select the control unit number (1-4). This is the connection number for the system on the local computer. - CU-950 USB/CU-960: Must be installed with the control unit number ***1***. - CU-950/CU-960 Advanced: Please contact your local GE Healthcare representative. • ***Auto save interval*** UNICORN saves a copy of the result file every five minutes during a run. This minimizes loss of data in the event of a computer failure. The interval cannot be changed. • ***Component...*** See step 4 below.

Step	Action
4	Some system strategies allow you to define the specific system components included in the system. • Click the ***Component*** button to specify the system components. • If the ***Component*** button cannot be clicked, go to step 5. *Result*: The ***Component*** dialog box is displayed.  **Note:** The strategy contains instructions for all possible components, but only instructions for the selected system components will be shown. • Select the check boxes for the components you want to add to the system and click ***OK***. **Caution!** If you make changes to a system, you may also have to change the arrangement of tubing, pumps, columns etc. on the system. An attempt to control a system using the wrong strategy may cause malfunction and ultimately damage the system.
5	Click ***OK*** and then ***Close***.

How to delete a system definition

The table below describes how to delete a system definition:

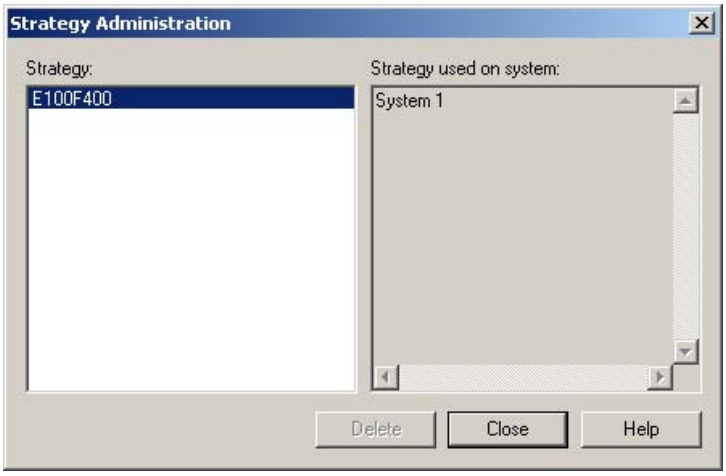
Note: A system definition can only be deleted if the system is idle and no users are connected to the system.

Step	Action
1	• Insert the UNICORN CD in the CD-ROM drive. *Result:* The Setup wizard starts and displays the ***Welcome*** screen. • Click the ***Next*** button.
2	The ***Select Components*** screen is displayed. • Make sure that the ***System Installation*** option is selected. You should deselect the other check boxes unless you want to install other components. • Click the ***Next*** button.
3	The ***Program Options*** screen is displayed. • Specify the number of ***System Control Windows*** you want to be available, normally the number of instruments that will be simultaneously connected to the PC. • Click the ***Next*** button.
4	The ***Start Copying Files*** screen is displayed. • Click the ***Next*** button.
5	The ***System installation*** screen is displayed. • Select the radio button corresponding to the system you want to delete. • Click the ***Change*** button to display the ***System Setup*** screen. • Click the ***Clear*** button to clear all the fields. • Click ***OK*** to go back to the ***System Installation*** screen. • Click the ***Next*** button. • Click the ***Finish*** button. **Note:** You can see the screen images in *Section 2.3.2 How to install UNICORN, on page 44*.

How to delete a strategy

The table below describes how to delete a strategy.

Note: You can only delete strategies that are not currently in use.

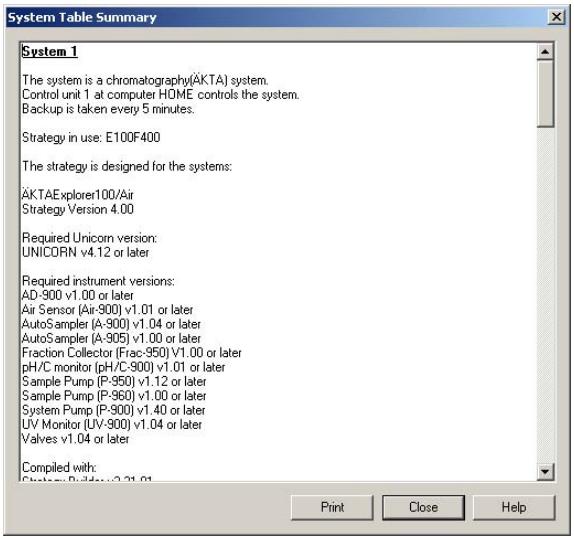
Step	Action
1	Select ***Administration:System setup*** in the ***UNICORN Manager***. *Result*: The ***System Setup*** dialog box is displayed.
2	Click the ***Strategy*** button. *Result*: The ***Strategy Administration*** dialog box is displayed. 
3	Select a strategy and click the ***Delete*** button.

How to view or print a system summary

You can view and print a total summary of a selected system from the ***System Table Summary*** dialog box.

The table below describes how to view and print an information summary of a selected system:

Step	Action
1	Choose ***Administration:System Setup*** in the ***UNICORN Manager***. *Result*: The ***System Setup*** dialog box is displayed.

Step	Action
2	• Select (click the icon of) the system you want a summary of. • Click the ***Summary*** button. *Result*: ***System Table Summary*** dialog box is displayed: 
3	• Click the ***Print*** button to print out the information. • Click the ***Close*** button to exit the dialog box.

6.2.2 Audit trails

Purpose

The audit trail provides the system administrator with a full record of UNICORN usage and system activity.

The different types of audit trail files

There are two types of audit trail files, global files and system-specific files:

The *global* audit trail files

- are saved on the server disk in a network installation
- are examined via a network connection.

The *system* audit trail files

- are saved on the local station to which the ÄKTAexplorer 100 system is physically connected
- can be examined from the local station without logging on to the network
- can be examined from any computer in a network installation.

Tabs of the Audit trail dialog box

The ***Audit trail*** dialog box has two or more tabs, one ***Global*** tab and a ***System*** tab for each installed system.

- The global tab displays usage information for the complete UNICORN installation.
- The system tab(s) displays usage information for a chosen system.

How to view the audit trail files

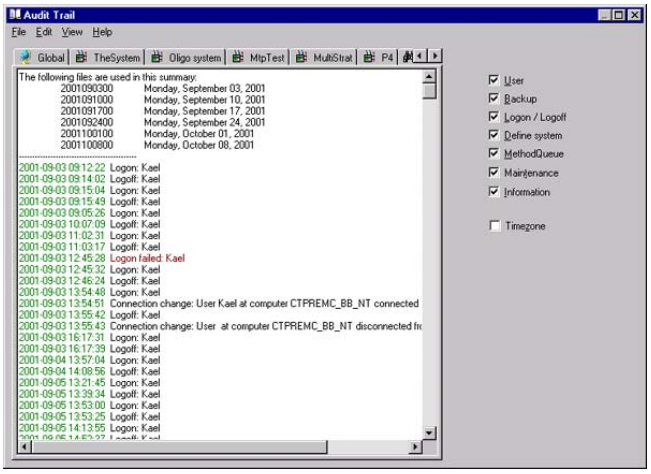
The table below describes how to examine the global and system audit trail files:

Step	Action
1	Choose ***Administration:Audit Trail*** in the ***UNICORN Manager***. *Result*: The ***Audit Trail*** dialog box is opened, see the illustration in *The Global tab* below.

Step	Action
2	By default the ***Global*** tab is displayed which shows the information of the global audit trail file. If you want to examine the audit trail file for a system, click a ***System*** tab. There is one tab for each installed system. See illustration in *The System tab* below.
3	Select the check boxes for the items you want to display. **Note:** All items are recorded in the audit trail. The check boxes only control which items are displayed in the dialog box.

The Global tab

The illustration below shows the ***Global*** tab of the ***Audit Trail*** dialog box:



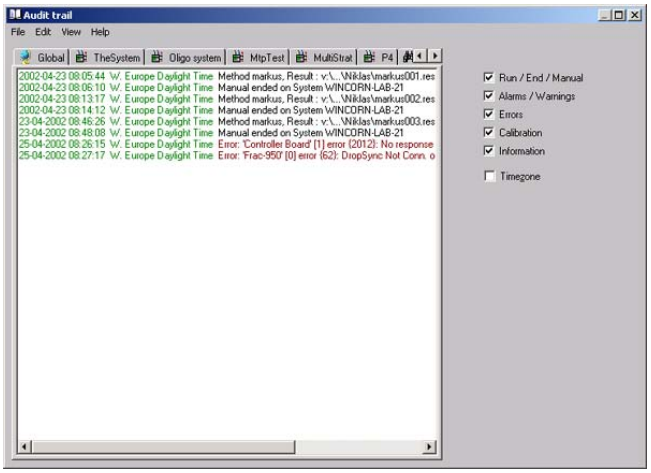
The items of the Global tab

The table below describes the items which can be displayed on the ***Global*** tab:

Item	Displays
User	• user creation, deletion and redefinition. • creation of rescue file for system definitions • restoration of system definitions with rescue file • changes of global and personal lists: - column list - report format - templates - evaluation procedures • column protection mode enable/disable
Backup	backup operations for global audit trail files.
Logon/Logoff	• all logon and logoff attempts • the name of the user logging on or off • failed logon attempts.
Define system	system definition, deletion and definition.
MethodQueue	MethodQueue start operations.
Maintenance	maintenance activities that are scheduled in the ***System Control*** module (menu command ***System:Maintenance***). **Note:** The activity is logged when a maintenance warning is shown and acknowledged or ignored.
Information	• system lock/unlock • socket on/off • global log started/stopped
Timezone	the time zone where the activity was logged.

The System tab

The illustration below shows a ***System*** tab of the ***Audit Trail*** dialog box:



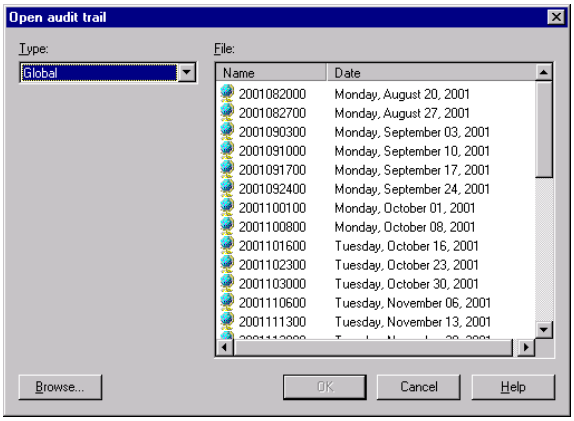
The table below describes the items which can be displayed on a ***System*** tab:

Item	Displays
Run/End/Manual	• the times for start and completion of a run • the times for manual operation.
Alarms/Warnings	alarms and warnings defined in the strategy for the system.
Errors	system errors.
Calibration	monitor calibration operations.
Information	system log started.
Timezone	the time zone where the activity was logged.

How to view previous audit trail files

A new audit trail file is created at regular intervals and the old audit trail file is automatically saved. See *How to renew audit trail files* below for more information.

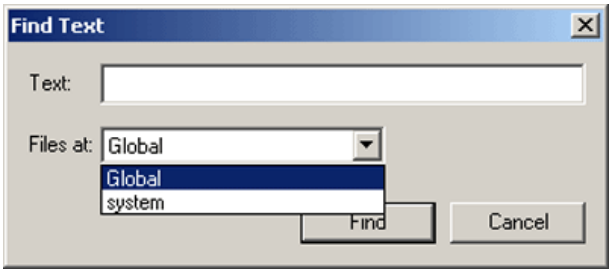
The table below describes how to view previous audit trail files:

Step	Action
1	Choose ***Administration:Audit Trail*** in the ***UNICORN Manager***. *Result*: The ***Audit Trail*** dialog box displays the *current* audit trail.
2	• Choose ***File:Open*** to display the ***Open audit trail*** dialog box: 
3	• Choose ***Global*** or a ***System*** in the ***Type*** drop-down box. • Select the file(s) to open from the ***File*** list: - Use the **CTRL** key if you want to open several audit trail files at the same time. - Click the ***Browse*** button if you want to open a file which is not listed. **Note:** Files are named by date and serial number. • Click ***OK***. *Result*: The audit trail file(s) is now displayed on a new, temporary tab.

How to search for text in audit trail files

The table below describes how to search for text in audit trail files:

Step	Action
1	Choose ***Administration:Audit Trail*** in the ***UNICORN Manager***. *Result*: The ***Audit Trail*** dialog box is displayed.

Step	Action
2	If you want search the *currently open* audit trail file • press the **CTRL** + **F** keys or choose ***Edit:Find in current log***. **Note:** The currently open audit trail is the one displayed in the ***Audit trail*** dialog box and depends on the selected tab (***Global*** or a ***System***). • type the text string you want to find in the ***Find Text*** dialog box and click the ***Find*** button. • press the **F3** key (or choose ***Edit:Find next***) to find the next occurrence of the search string.
3	If you want to search *all the existing* audit trail files, either ***Global*** or ***System***, • choose ***Edit:Find in log files***. • type the search string, choose whether to search ***Global*** or ***System*** audit trail files in the ***Files at*** drop-down box, and click the ***Find*** button.  *Result*: The search results are displayed on a new, temporary tab named ***Find result***.

How to print audit trails

The table below describes how to print an audit trail file:

Step	Action
1	Choose ***Administration:Audit Trail*** in the ***UNICORN Manager***. *Result*: The ***Audit Trail*** dialog box is displayed.

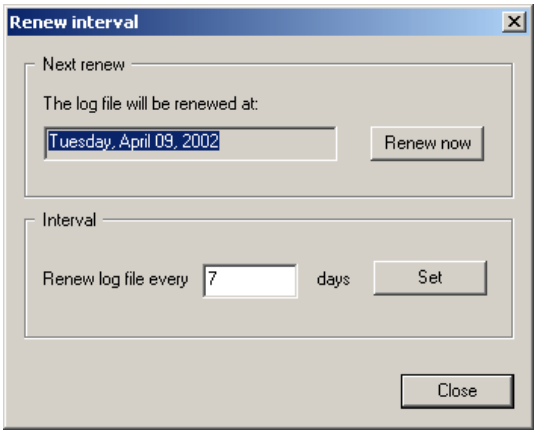
Step	Action
2	• Select the ***Global*** tab or a ***System*** tab. • If you want to print other audit trail files than the currently open, then open the file(s) as described in *How to view older audit trail files* above.
3	Choose ***File:Print*** to print the file(s) displayed in the dialog box.

How to renew audit trail files

The audit trail file is renewed at regular intervals between 1 to 30 days. The old audit trail file is then saved automatically together with all the previous audit trail files.

The table below describes how to set the renewal interval and how to renew the audit trail immediately:

Step	Action
1	Choose ***Administration:Audit Trail*** in the ***UNICORN Manager***. Result: The ***Audit Trail*** dialog box is displayed.
2	Choose ***View:Renew interval***. *Result*: The ***Renew interval*** dialog box is displayed.



Step	Action
3	**Set renewal interval** • Type the desired interval in the ***Interval*** field. The standard value is 7 days. • Click the ***Set*** button. *Result*: The new ***Interval*** setting will take effect after the next scheduled renewal, or immediately if the ***Renew now*** button is clicked. **Renew now** • Click the ***Renew now*** button to start a new audit trail file. The old file is saved automatically. *Example*: If the audit trail is set to renew every 7 days and you click ***Renew now*** on a Friday, a new file will be started immediately and another file will be started the following Friday.
4	Click the ***Close*** button.

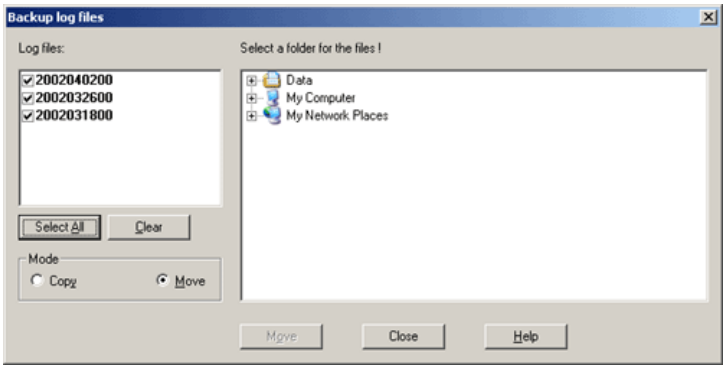
How to back up audit trail files

The table below describes how to back up audit trail files.

Note: Old audit trail file are automatically saved each time a new one is created. This backup function is only necessary if you want to copy or move the audit trail files to a specific location.

Step	Action
1	Choose ***Administration:Audit Trail*** in the ***UNICORN Manager***. *Result*: The ***Audit Trail*** dialog box is displayed.

Step	Action
2	Choose ***File:Backup***. *Result*: The ***Backup log files*** dialog box is displayed.



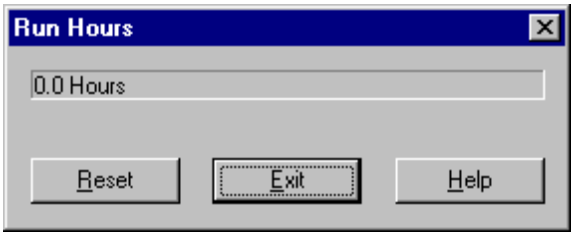
3	You can choose either to copy or move the log files. • Select the files you want to back up in the ***Log files*** field. • Select a destination folder in the structure tree. • Select to ***Copy*** or ***Move*** the file(s) in the ***Mode*** field. The ***Move*** alternative is recommended to save disk space. • Click the ***Copy*** or ***Move*** button, depending on the previous choice. • Click the ***Close*** button. **Note:** Backup operations are recorded in the audit trail.

How to display the system run hours

Run hour values show the number of hours that the system has been used for manual or method-controlled runs. The ***Run hours*** record is useful if you want follow up the expected and actual lifetimes for liquid handling components.

The table below describes how to display (and reset) the system run hours:

Step	Action
1	Choose ***Administration:Audit Trail*** in the ***UNICORN Manager***. *Result*: The ***Audit Trail*** dialog box is displayed.

Step	Action
2	• Choose a ***System*** tab. • Choose ***View:Run hours***. *Result*: The ***Run Hours*** dialog box with the accumulated run time for the system is displayed. 
3	• If you want to reset the accumulated run hours to zero (0), click the ***Reset*** button. • Click the ***Exit*** button. **Note:** The reset time is recorded in the audit trail.

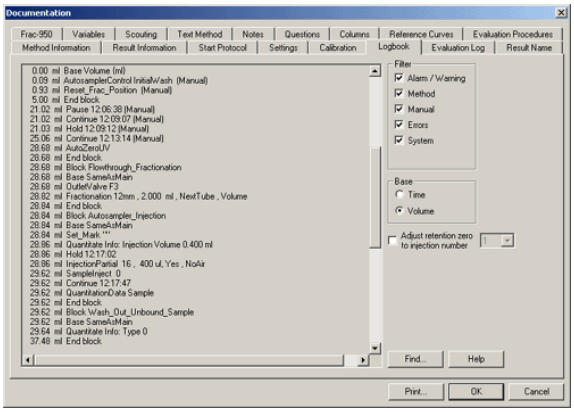
Other sources of information

Parts of the audit trail information can also be found in the ***Documentation*** dialog box, available in the ***Evaluation*** and ***System Control*** modules.

The table below describes how to open the ***Documentation*** dialog box:

Step	Action
1	• Open the ***Evaluation*** module or the ***System Control*** module. • Click the ***View Documentation*** icon.  *Result*: The ***Documentation*** dialog box is opened.

Step	Action
2	Select the ***Event Log*** or the ***Logbook*** tab to view some of the audit trail information. See the example below.



6.2.3 How to back up and restore system definitions

Introduction

You can create a backup file with system information and store it on a diskette or another drive. The backup file will contain information about

- Global files
  - global BufferPrep recipes
  - global columns
  - global evaluation procedures
  - global report formats
- Personal files
  - personal BufferPrep recipes
  - personal columns
  - personal evaluation procedures
  - personal report formats
- System files
  - user setup
  - system setup

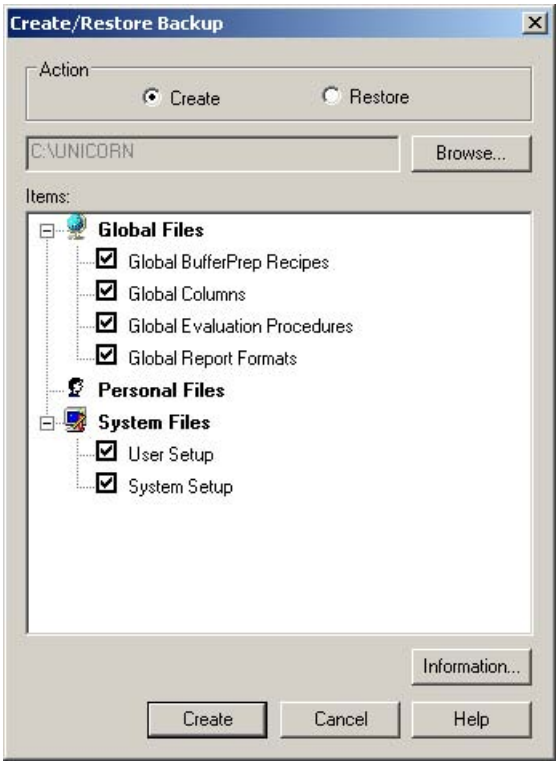
Afterwards you can use the backup file to restore the system definitions if they are corrupted.

How to back up the system definitions

The table below describes how to create a backup file and store it for example on a rescue diskette:

Step	Action
1	Insert a diskette into the computer if you want to store the backup file on a diskette.

Step	Action
2	Choose ***Administration:Create/Restore Backup*** in the ***UNICORN Manager*** to display the ***Create/Restore Backup*** dialog box:



3

- In the ***Action*** field, make sure that the ***Create*** option is selected.
- Click the ***Browse*** button to select where to store the backup file.
  Note: Select `A:\` to store the file on a diskette.
- In the ***Items*** field, select which information to include on the backup file.
- Click the ***Create*** button to create the backup file and store it in the selected location. The created backup file has the ending `.bck`.

Note: You can click the ***Information*** button to see which information files will be included in the backup file.

How to restore the system definitions

The table below describes how to restore the system definitions from a backup file, located for example on a rescue diskette.

Note: Any user can restore their personal files. To restore global and system files the user needs the access item ***Edit global list(s)***, see *Section 6.3.2 Access items, on page 166*.

Step	Action
1	If the backup file is located on a diskette, insert the diskette into the computer.
2	Choose ***Administration:Create/Restore Backup*** in the ***UNICORN Manager*** to display the ***Create/Restore Backup*** dialog box:

Step	Action
3	• If the backup file is located in a different place than the path indicates, click the ***Browse*** button to select the correct folder. **Note:** Select **A:** if the file is located on the diskette. • In the ***Items*** field, select which information to include from the backup file. • Click the ***Restore*** button to restore the system definitions. **Note:** You can click the ***Information*** button to see which information files are included in the backup file.

6.3 User Administration

Introduction

Access to the UNICORN software is controlled by username and password authorization. This is done from within the UNICORN program, where each authorized user is assigned to an access group that determines which functions the user can perform.

In this section

The table below describes the contents of this section:

Section	See page
6.3.1 User access groups	162
6.3.2 Access items	166
6.3.3 How to create a new user	169
6.3.4 How to assign user properties	175
6.3.5 How to change user passwords and user attributes	184
6.3.6 How to delete users and folders	188

6.3.1 User access groups

Introduction

This section describes

- the purpose of access groups and access items
- how to view and edit the access groups
- suggested responsibilities for some typical access groups.

Kinds of access groups

A UNICORN installation has 10 different access groups with different rights to perform actions in the UNICORN system. Some access groups are predefined while others are undefined. The table below describes the different kinds of access groups:

Kind of access group	Description
Predefined	The following applies to the predefined groups: • Each group has a name that reflects the status of its members, such as ***Administrator*** and ***Process operator***. • Each group has different rights to perform actions in the UNICORN system. • The names and rights of the groups can be changed to the requirements of each individual group.
Undefined	If the system administrator wants to create access groups in addition to the predefined groups, he or she can use the undefined access groups. The following applies to the undefined groups: • They have generic numbered names, like "Group 7", "Group 8" and so on. • They do not have any rights defined. • It is up to the system administrator to define names and rights to the undefined groups.

The access items

The access items are used to assign rights to the access groups. How to assign rights to the access groups is described in "How to edit the access groups" below.

Each access item is described in *Section 6.3.2 Access items, on page 166*.

The User Setup dialog box

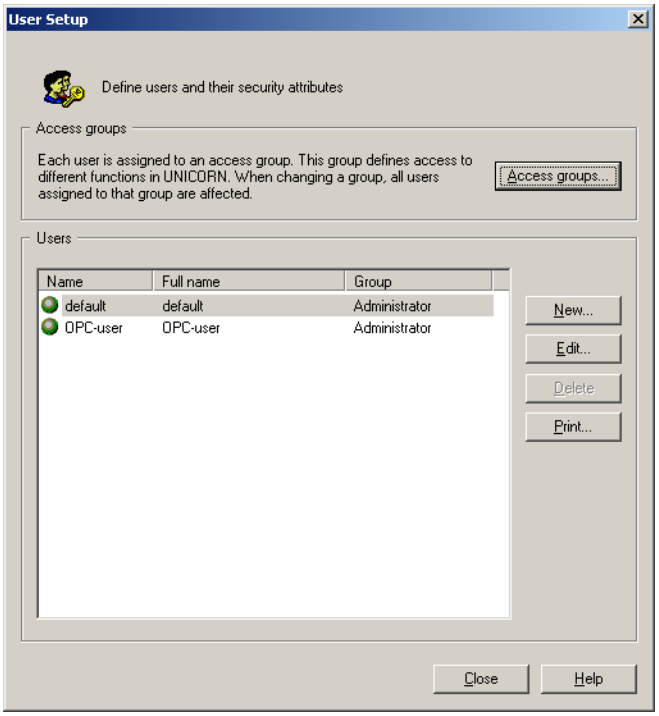
From the ***User Setup*** dialog box you can

- see which access group each user belongs to
- view the access level of each access group
- change user access groups.

Note: Other actions which can be performed from the ***User Setup*** dialog box are described in subsequent sections of this chapter.

How to open the dialog box

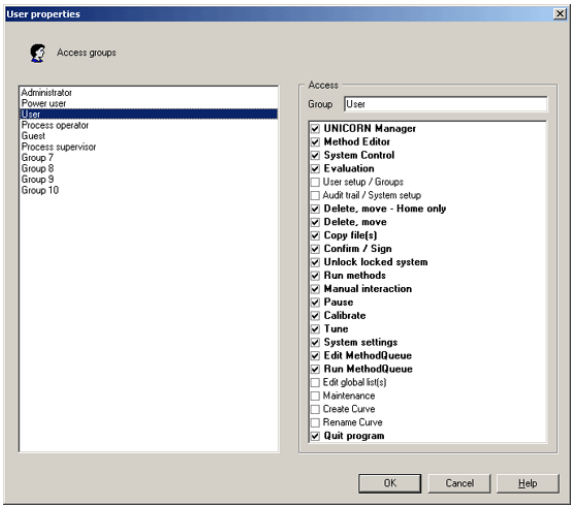
Choose ***Administration:User Setup*** in the ***UNICORN Manager*** when you want to display the ***User Setup*** dialog box. See illustration below:



How to view the access groups

To view the access groups, you must have ***User setup/Groups*** access. See *Section 6.3.2 Access items, on page 166* for an explanation of the access items.

The table below describes how to view the access groups and their properties:

Step	Action
1	Choose ***Administration:User Setup*** in the ***UNICORN Manager***. *Result*: The ***User Setup*** dialog box is displayed.
2	Click the ***Access groups*** button. *Result*: The ***User properties*** dialog box is displayed: 
3	Select a group in the left field to view its access items in the right field (***Access***). **Note:** The authorization items that are valid for the group are written in bold style and have selected check boxes.

How to edit the access groups

UNICORN has 10 different access groups that can be named and assigned to different levels of access to UNICORN.

The table below describes how to edit the access groups:

Step	Action
1	Choose ***Administration:User Setup*** in the ***UNICORN Manager***. *Result*: The ***User Setup*** dialog box is displayed.
2	Click the ***Access groups*** button. *Result*: The ***User properties*** dialog box is displayed.
2	**Change the name of a group** • Select the group in the left field of the dialog box. • Type a new name in the ***Group*** text box. • Click ***OK***.
3	**Choose access items for a group** • Select the group in the left field of the dialog box. • Select the check boxes in the right field (***Access***) to choose access items. • Click ***OK***. **Note:** If you edit the definition of an access group to which users are already assigned, the changes will apply to all users in the group.

Special conditions

Certain access items cannot be completely removed:

- ***User setup/Groups***

  At least one access group must have this access item. UNICORN will not allow you to remove this access item from all access groups.

- ***UNICORN Manager***

  If access to the UNICORN Manager is restricted for an access group, the access group will still be able to

  - Log off
  - Quit program
  - Change user attributes
  - Change password

6.3.2 Access items

What is an access item?

An access item specifies a specific action that the user is allowed to perform in the UNICORN system. The access items are assigned to one or more user access group(s) in the ***User properties*** dialog box, see *Section 6.3.1 User access groups, on page 162*.

To view the access items,

- choose ***Administration:User Setup*** in the ***UNICORN Manager*** and click the ***Access groups*** button.

  Result: The access items are listed in the ***Access*** field (when the access group is selected).

Description of the access items

The table below describes each access item:

Access item	Allows the user
UNICORN Manager	to create and edit methods with the ***UNICORN Manager***.
Method Editor	to create and edit methods for pre-programmed control of systems with the ***Method Editor*** module.
System Control	to control and monitor processes online with the ***System Control*** module.
Evaluation	to process result data with the ***Evaluation*** module.
User setup/Groups	to define and change access levels and users. *Caution!* It is recommended that only one user in an installation or network is assigned this access item.
Audit trail/System set-up	to examine the audit trail and define connected systems. *Caution!* It is recommended that only one user in an installation or network is assigned this access item.
Delete, move - Home only	to delete and move files and folders within the user's home folder. It does not authorize these operations on other folders.
Delete, move	to delete and move files and folders both outside and within the user's home folder.

Access item	Allows the user
Copy file(s)	to copy files. The user must have access to both the source and target folders in order to move or copy between folders.
Confirm/Sign	• to confirm answers to start protocol questions • to sign methods and result files.
Unlock locked system	to unlock locked systems with the user's own logon passwords. Locked systems can normally only be unlocked with the locking password. **Note:** We recommend that this access item is restricted to a few users in an installation. The user who locks a system does not require this access item to unlock the same system.
Run methods	to start methods.
Manual interaction	to issue manual commands in ***System Control***.
Pause	to pause a running process with the ***Pause*** button in ***System Control***. **Note:** The ***Pause*** instruction in methods does not require explicit authorization.
Calibrate	to use the ***Calibrate*** commands in ***System Control***.
Tune	to use the ***Tune*** commands in ***System Control***.
System settings	to change system settings with the ***Settings*** command in ***System Control***. **Note:** Any user can view the system settings, but this access item is required to make changes to the settings.
Edit MethodQueue	to use the ***MethodQueue*** editor.
Run MethodQueue	to run MethodQueues.

Access item	Allows the user
Edit global list(s)	• to save - a method as a method template - an evaluation procedure as globally available - a report format as globally available - a column in the ***Column*** list or ***BufferPrep*** recipe (also ***Quantitation*** tables and ***Mol Size*** tables if the ***Analysis*** module is installed) as globally available. • to delete - method templates - global procedures - global report formats - global columns - global ***BufferPrep*** recipes (also global ***Quantitation*** tables and global ***Mol Size*** tables). • to restore global user information files, user setup and system setup. **Note:** We recommend that this access item is restricted to only one user in an installation.
Maintenance	to gain access to the ***System:Maintenance*** command in ***System Control***.
Create Curve	to create curves in the ***Evaluation*** module.
Rename Curve	to rename curves in the ***Evaluation*** module.
Quit program	to end a UNICORN session with the ***File:Quit Program*** command in the ***UNICORN Manager***.

6.3.3 How to create a new user

Introduction

This section describes how to create a new user and assign a home folder for a user's methods and results.

The default user

A default user is created when the system is installed. The default user has unrestricted access to all UNICORN functions. You log on with this profile when you access a newly installed system for the first time.

Note: The default user should be deleted when regular user profiles have been created.

The table below describes how to log on as the default user:

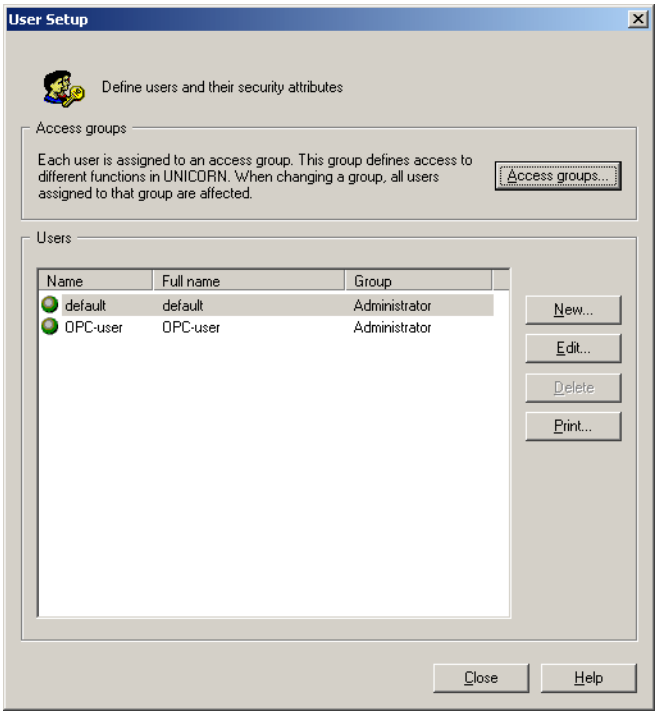
Step	Action
1	Start UNICORN.

Step	Action
2	• Select user ***default*** from the ***User name*** drop-down list. • Type the password `default`. • Click ***OK***. **Note:** The ***default*** user is the only user where the user name and the password can be identical. 

The User Setup dialog box

All user administration is performed in the ***User Setup*** dialog box in the ***UNICORN Manager*** module. It is accessible only to authorized users (and the default user).

- Choose ***Administration:User Setup*** when you want to display the ***User Setup*** dialog box. See the illustration below.



Instruction

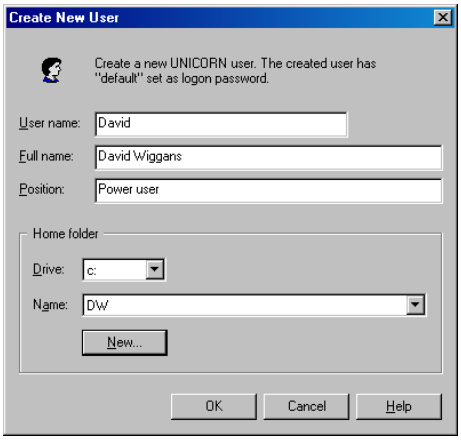
The table below describes how to create a new user:

Step	Action
1	Click the ***New*** button in the ***User Setup*** dialog box. *Result*: The ***Create New User*** dialog box opens. See illustration below this table.
2	• Type a user name in the ***User name*** text box. • Type the full name of the user in the ***Full name*** text box. • Type the position of the user in the ***Position*** text box.

Step	Action
3	**Select a Home folder** • Select a drive from the ***Drive*** drop-down list and a folder from the ***Name*** drop-down list. • Go to step 6. **Create a Home folder** • If you need to create a new home folder, go to step 4. See "Home folders" below this table for more information.
4	Click the ***New*** button. *Result*: The ***Create New Folder*** dialog box opens.
5	• Select a drive and type a folder name. • Click ***OK*** *Result*: The folder is created and you return to the ***Create New User*** dialog box.
6	Click ***OK***. *Result*: The new user is created and added to the ***Users*** list of the ***User Setup*** dialog box.
7	Repeat step 1 - 6 if you want to create more users.
8	Click the ***Close*** button.

The Create New User dialog box

The illustration below displays the ***Create New User*** dialog box:



Home folders

General

Each user should be assigned to a home folder, preferably created on a network drive. If the home folders are created on the local drive (C:) they will not be accessible from other computers.

Network installations

Always create home folders on a network drive which is accessible from all computers. Make sure that the drive is addressed by the same drive letter from all computers in the network.

Non-network installations

A home folder can always be created on a network drive even if UNICORN is not installed for network control. The computer only needs to be connected and logged on to the local network.

How to create subfolders to the home folder

The table below describes how to create new folders in the home folder:

Step	Action
1	In the ***UNICORN Manager***, choose ***File:New:Folder***. *Result*: The ***Create New Folder*** dialog box is displayed.
2	• Type the new folder name in the dialog box. • Click ***OK***.

Note: This operation can be performed by each user in their own home folders.

6.3.4 How to assign user properties

Introduction

In the ***User properties*** dialog box in the ***UNICORN Manager*** module, users are assigned different properties that define for example

- folders and chromatography systems that the user can access
- password rules.

How to open the User properties dialog box

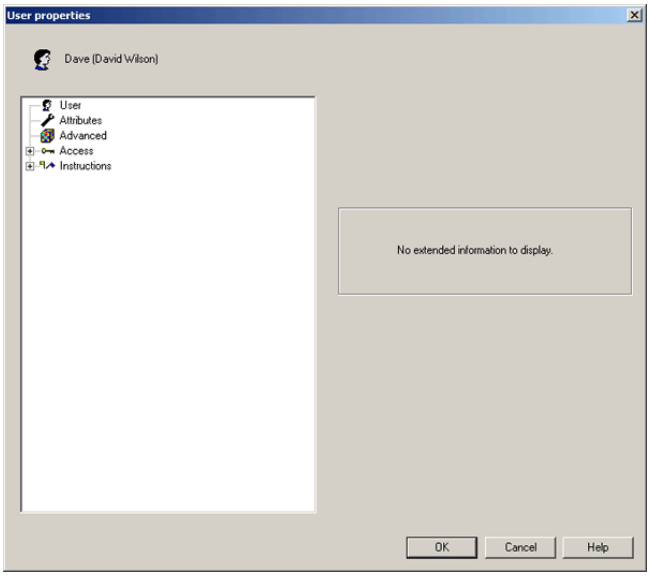
The table below describes how to open the ***User properties*** dialog box.

Step	Action
1	Choose ***Administration:User Setup*** in the ***UNICORN Manager*** module. *Result*: The ***User Setup*** dialog box is displayed.
2	• Select a user in the ***Users*** list. • Click the ***Edit*** button. *Result*: The ***User Properties*** dialog box is displayed. **Note:** By default the ***User*** item is displayed when the dialog box opens. Select another item (***Attributes***, ***Advanced***, ***Access*** or ***Instructions***) to view their respective properties.

Note: The dialog box is illustrated in Items of the User properties dialog box below.

Items of the User properties dialog box

The illustration below displays the ***User properties*** dialog box with no item selected:



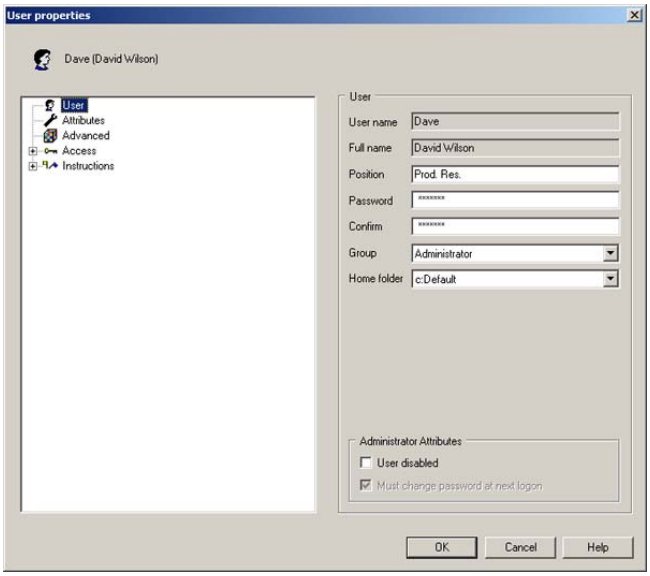
Items

The table below lists the items of the ***User properties*** dialog box and some of their properties that can be edited:

Items	Property examples
User	User name, password, access group
Attributes	User interface and program options
Advanced	Password age, account lock
Access	Access to folders and systems
Instructions	Available manual instructions, sounds

The User item

The illustration below displays the ***User properties*** dialog box with the ***User*** item selected:

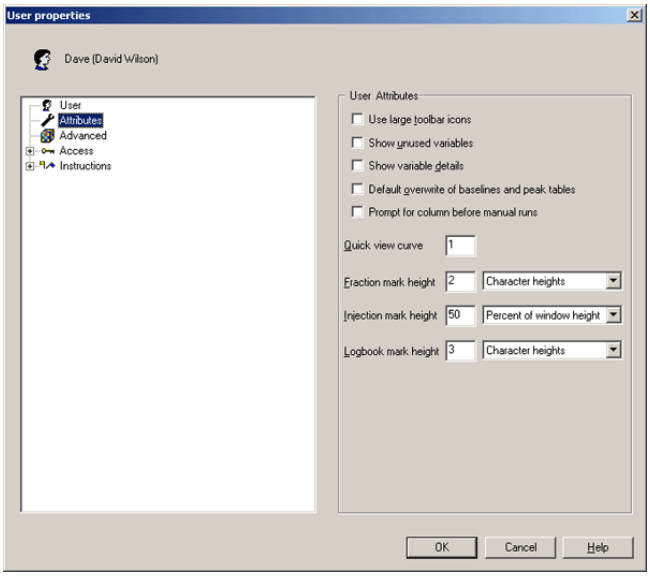


The table below describes how to edit the ***User*** item of the ***User properties*** dialog box.

Step	Action
1	Open the ***User properties*** dialog box (see the table in beginning of this section) and select the ***User*** item.
2	• Type a new password in the ***Password*** text box. • Type the password again in the ***Confirm*** text box. **Note:** The password entries must be identical to be accepted. Passwords are case sensitive in UNICORN.
3	• Select an access group from the ***Group*** drop-down list. **Note:** A pre-defined access group is assigned a certain level of access to UNICORN. • Select a folder from the ***Home folder*** drop-down list.
4	• Click ***OK***. • Select another item to edit if desired. See further information below.

The Attributes item

The illustration below displays the ***User properties*** dialog box with the ***Attributes*** item selected:



Attributes

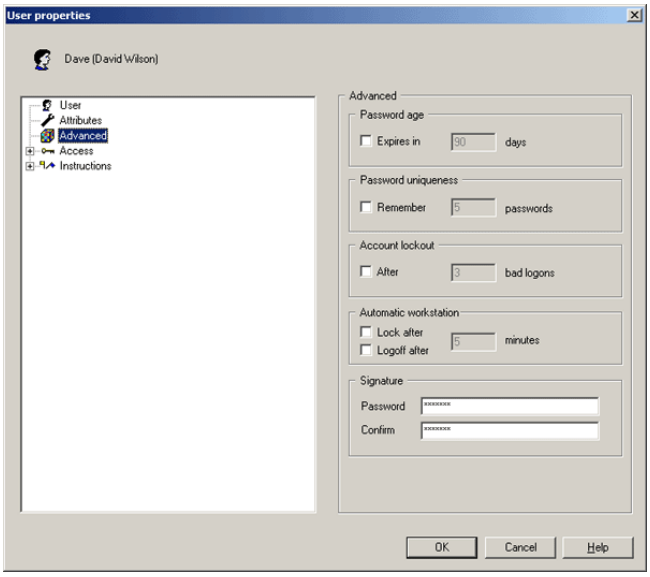
The table below describes the ***User Attributes***:

User Attribute	Description
Use large toolbar icon	Display large toolbar icons in all modules.
Show unused variables	Show variables that are not used in the method on the ***Variable*** page of the ***Start Protocol***.
Show variable details	Show detailed method variables on the ***Variable*** page of the ***Start Protocol***.
Default overwrite of baselines and peak tables	When new baselines and peak tables are created, the old ones are overwritten.
Prompt for column before manual runs	A manual run must have an ***Alarm_Pressure*** text instruction inserted before the first instructions are executed.

User Attribute	Description
Quick view curve	Select which of the chromatogram curves (1-46) to display in Quick view. *Example*: The value "**1**" displays the first chromatogram curve which is usually the UV curve.
Fraction mark height	Indicates the height of each fraction mark in a chromatogram.
Injection mark height	Indicates the height of each injection mark in a chromatogram.
Logbook mark height	Indicates the height of each logbook mark in a chromatogram.

The Advanced item

Open the ***User properties*** dialog box (see the table in the beginning of this section) and select the ***Advanced*** item:



Advances properties

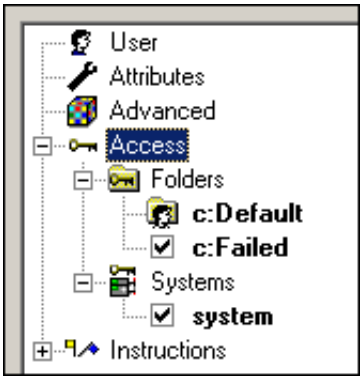
The table below describes the ***Advanced*** properties:

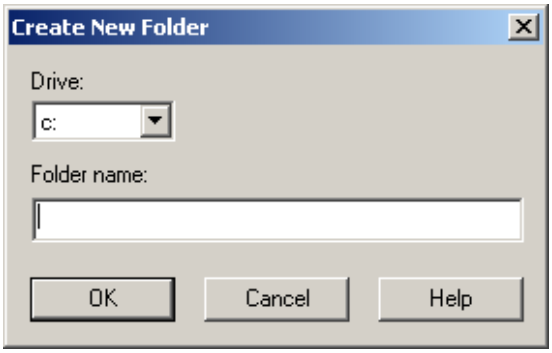
Property	Description
Password age	The number of days a password is valid (14-182).
Password uniqueness	How many times a password must be changed before the same password can be used again (1-1024).
Account lockout	How many bad logins that are allowed before the account is locked (1-20).
Automatic workstation lock/logoff	How many minutes of inactivity before the workstation is locked or the user is logged off (1-480).
Signature	An additional password **Note:** This cannot be the same as the logon password.

The Access item

The ***Access*** item is used to define which folders and systems that the user has access to.

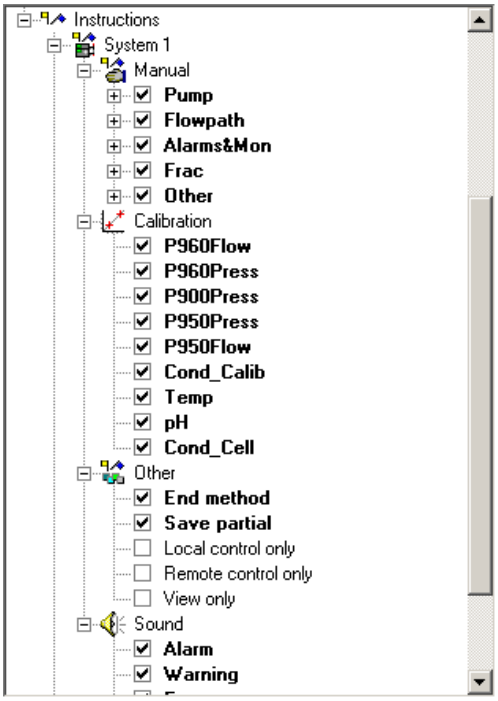
Step	Action
1	• Open the ***User properties*** dialog box (see the table in the beginning of this section) and select the ***Access*** item. *Result*: The ***Folders*** and ***Systems*** subitems are displayed. • Click the plus signs to expand the subitems, see the illustration below:



Step	Action
2	**The Folders subitem** The user has access to all files and sub-folders in the selected folders. Up to 20 folders can be set up. Only folders that are selected will be visible in the ***Methods*** and ***Results*** windows of the ***UNICORN Manager*** module. **Note:** All users should have access to the ***Failed*** folder on each local station in a network installation. This will ensure that users can access results that were saved in the ***Failed*** folder in case of a network communication error. **The Systems subitem** The selected systems are available for the user.
3	This step describes how to create a new folder and give the user has access to it: To create a new folder • select the ***Folders*** item • click the ***New*** button to display the ***Create New Folder*** dialog box:  • select the ***Drive***, type the name of the folder and click ***OK*** **Note:** The folder is created in the default location on the selected drive, for example `C:\UNICORN\Local\Fil`, and *not* in the root directory. • select the ***Folders*** item • select the check box for the new folder. • Click ***OK***

The Instructions item

Open the ***User properties*** dialog box (see the table in the beginning of this section) and select the ***Instructions*** item:



The table below describes the subitems of the ***Instructions*** item:

Subitem	Determines
Manual	which manual instructions should be available to the user.
Calibration	which monitors the user should be allowed to calibrate.
Other	• if the user should be allowed to end a method (***End method***) or save a partial run (***Save partial***). • how the system should be available to the user (***Local control only***, ***Remote control only*** or ***View only***).
Sound	which events that should render a sound. Different sounds can be assigned to each event.

How to print user setup information

The table below describes how to print the properties for selected users:

Step	Action
1	Choose ***Administration:User Setup*** in the ***UNICORN Manager***. *Result*: The ***User Setup*** dialog box is displayed.
2	Select a user and click the ***Print*** button. *Result*: The ***Print*** dialog box is displayed.
3	• If desired, click the ***Select All*** button to print information for *all* users. • Select the check boxes for the ***Print Items*** that you want to include. • Click ***OK***.

6.3.5 How to change user passwords and user attributes

Introduction

This section describes

- how to change the password for a selected user
- how users change their own passwords
- how users change their user attributes.

Changes to user passwords and user attributes are made in the ***UNICORN Manager*** module.

Rules and recommendations for UNICORN passwords

The list below summarizes rules and recommendations for UNICORN passwords:

- The system can be set up to operate without required passwords.
- The minimum number of password characters is set up at the installation.
- Passwords can be any combination of letters and numbers.
- Passwords are case sensitive.
- Avoid using obvious passwords.
- You cannot use the user name as password (except for the ***default*** user).
- The ***Advanced*** settings in the ***User properties*** dialog box determine the expiration time for passwords. Passwords should be changed regularly by the users even if the user profile is set up without a password expiration time.

How to change the password for a selected user

A user which has ***User setup/Groups*** access (usually a system administrator) can change the password for any user.

The table below describes how to change the password for a selected user:

Step	Action
1	Choose ***Administration:User Setup*** in the ***UNICORN Manager***. *Result*: The ***User Setup*** dialog box is displayed.

Step	Action
2	Select the user in the list and click the ***Edit*** button. *Result*: The ***User properties*** dialog box is displayed.
3	• Select the ***User*** item in the dialog box. See *Section 6.3.4 How to assign user properties, on page 175* for an explanation of the User item. • Type the new password in the ***Password*** and ***Confirm*** fields.
4	Click ***OK*** and then the ***Close*** button.

How to change the attributes for a selected user

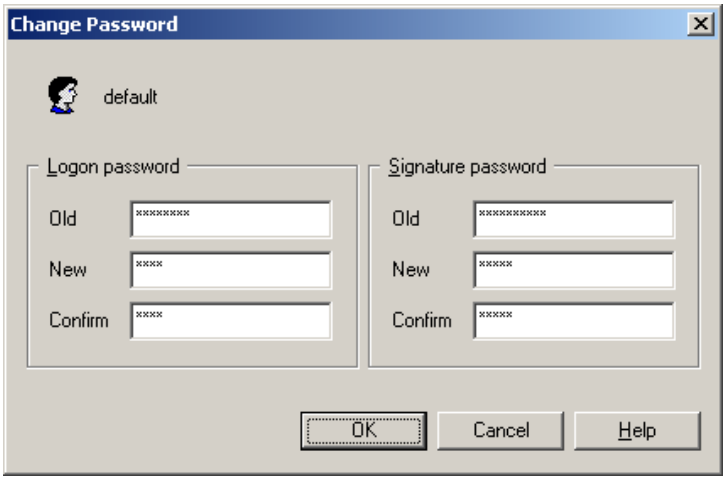
A user which has ***User setup/Groups*** access (usually a system administrator) can change the attributes for any user.

The table below describes how to change the attributes for a selected user:

Step	Action
1	Choose ***Administration:User Setup*** in the ***UNICORN Manager***. *Result*: The ***User Setup*** dialog box is displayed.
2	Select the user in the list and click the ***Edit*** button. *Result*: The ***User properties*** dialog box is displayed.
3	• Select the ***Attributes*** item in the dialog box. See *Section 6.3.4 How to assign user properties, on page 175* for an explanation of the Attributes item. • Make the desired changes.
4	Click ***OK*** and then the ***Close*** button.

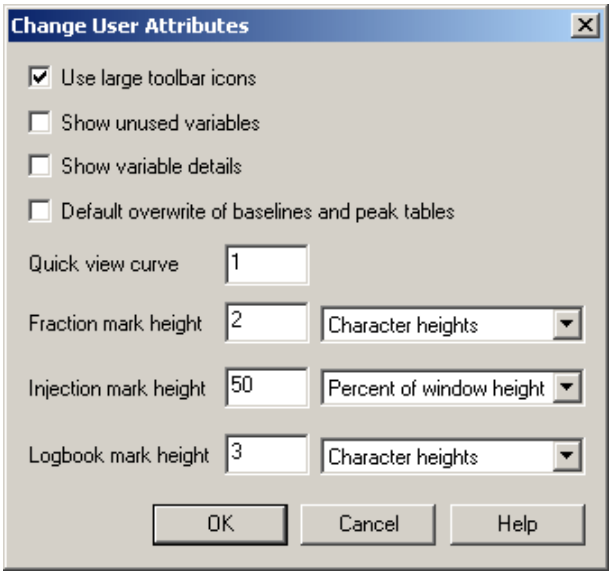
How users change their own passwords

The table below describes how users change their own logon and signature passwords:

Step	Action
1	Choose ***Administration:Change Password*** in the ***UNICORN Manager***. *Result*: The ***Change Password*** dialog box opens. 
2	• Type the logon password in the ***Old*** text box of the ***Logon password*** field. **Note:** The passwords will only be shown as asterisks. • Type a new password in the ***New*** text box. • Repeat the new password exactly in the ***Confirm*** text box.
3	To define a Signature password repeat step 2 in the ***Signature password*** field. **Note:** The signature password cannot be the same as the logon password.
4	Click ***OK***.

How users change their own user attributes

The table below describes how users can change their own user attributes:

Step	Action
1	Choose ***Administration:Change User Attributes***. *Result*: The ***Change user attributes*** dialog box opens. 
2	• Make the desired changes. • Click ***OK***.

6.3.6 How to delete users and folders

Introduction

This section describes

- how to delete users and folders
- how to delete special folders:
  - home folders with assigned users
  - folders with shared access.

How to delete a user

The table below describes how to delete a user:

Step	Action
1	Choose ***Administration:User Setup*** in the ***UNICORN Manager***. *Result*: The ***User Setup*** dialog box is displayed.
2	• Select the user from the ***Users*** list and click the ***Delete*** button. • Click ***OK*** to confirm. **Note:** You can delete all users except the last user with ***User setup/Levels*** access. This ensures that at least one user has the right to perform administration functions.
3	Click the ***Close*** button.

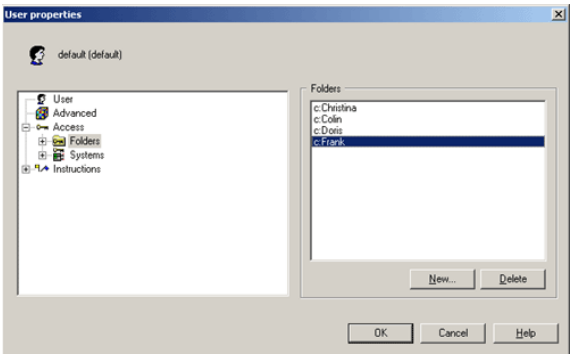
Note: When you delete a user, the user's home folder or method and result files are *not* deleted.

How to delete a folder

Caution! A deleted file/folder cannot be recovered.

The table below describes how to delete a folder.

Step	Action
1	Choose ***Administration:User Setup*** in the ***UNICORN Manager***. *Result*: The ***User Setup*** dialog box is displayed.

Step	Action
2	Select the user from the ***Users*** list and click the ***Edit*** button. *Result*: The ***User properties*** dialog box is displayed.
3	Select ***Access:Folders*** in the left field of the ***User properties*** dialog box. Select the user's folder in the ***Folders*** field, if it is not automatically selected. 
4	Click the ***Delete*** button and then the ***Yes*** button to confirm. **Note:** All methods, result files and folders within a selected folder will be deleted when the selected folder is deleted.
5	Click ***OK*** to close the dialog box and then the ***Close*** button.

How to delete special folders

The folders described below must be deleted in a different way than described above.

A home folder to which a user is assigned

To delete a home folder to which a user is assigned

- delete the user, then the home folder. See instructions above.

- or -

- change the home folder assignment for the user: Select the ***User*** item in the ***User Properties*** dialog box and assign a different home folder.

A folder to which several users share access.

To delete a folder to which several users share access

- first remove the access rights from each user (deselect the folder for each user under ***Access:Folders*** in the ***User properties*** dialog box), then delete the folder as described above.

7 System settings

Introduction

Each installed system has a set of default system settings which can be changed. This chapter gives an overview of the system settings and describes how to change them.

In this chapter

This chapter contains these sections:

Section	See page
7.1 The Instructions dialog box	192
7.2 Alarms settings	194
7.3 Specials settings	197
7.4 Monitors settings	198
7.5 Curves settings	199
7.6 CU-950/CU-960 settings	200

7.1 The Instructions dialog box

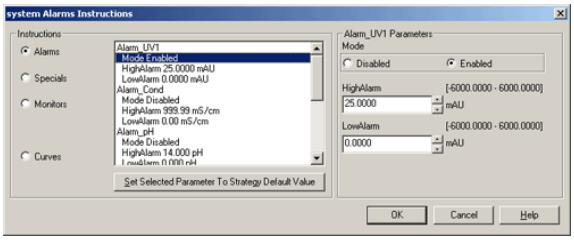
Default system settings

The system settings have default values which depend on the strategy used and which are valid for all of the runs. If you assign a new value to a system setting, the new value remains until you change the value again or return the setting to its strategy default value.

Instruction

The table below describes the ***Instructions*** dialog box and how it is used to change the system settings.

Note: To change the system settings, you need to have ***System settings*** access, see *Section 6.3 User Administration, on page 161*.

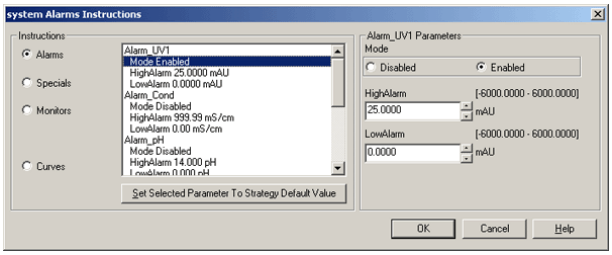
Step	Action
1	Choose ***System:Settings*** in the ***System Control*** module. *Result*: The ***Instructions*** dialog box for the connected system is displayed. 
2	Click a radio button to select one of the ***Instructions*** groups: • ***Alarms***: See *Section 7.2 Alarms settings, on page 194* for more information. • ***Specials***: See *Section 7.3 Specials settings, on page 197* for more information. • ***Monitors***: See *Section 7.4 Monitors settings, on page 198* for more information. • ***Curves***: See *Section 7.5 Curves settings, on page 199* for more information. *Result*: The instructions and parameters for the selected ***Instructions*** group is displayed.

Step	Action
3	**Instructions and parameters** In the list, • the "heading" items are *instructions* • the indented items are *parameters*.
4	**How to change a parameter setting** • Select an instruction or a parameter in the list box. • Use the controls to the right in the dialog box to change the associated parameter setting. *Result*: The parameter is updated in the list.
5	**How to restore a parameter to its default setting as defined in the system strategy** • Select a parameter in the list. • Click the ***Set Selected Parameter to Strategy Default Value*** button. *Result*: Only the currently selected parameter is returned to its default value.
6	**How to save the settings** • Click ***OK*** to save the settings when all the changes have been made. *- or -* • Click the ***Cancel*** button to discard all the changes made since the dialog box was last opened.

7.2 Alarms settings

Introduction

This section describes the ***Alarms*** settings which are available in the ***Instructions*** dialog box in the ***System Control*** module.



Note: How to open and use the ***Instructions*** dialog box is described in *Section 7.1 The Instructions dialog box, on page 192*.

Alarm and Warning limits

The ***Alarms*** settings define

- upper and lower warning limits
- upper and lower alarm limits

for process monitor signals.

Alarm limits

If the signal exceeds the ***Alarm*** limits

- an alarm sounds
- an alarm message is displayed
- the process is paused, that is the method execution is suspended and all pumps are stopped.

Warning limits

If the signal exceeds the ***Warning*** limits a warning message is issued without interrupting the process.

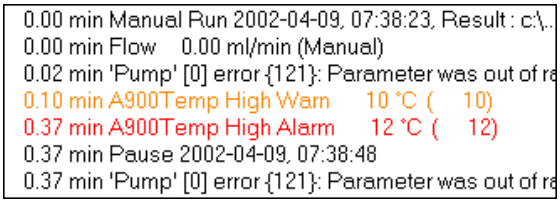
Messages are displayed on all stations

Alarm and warning messages are displayed on *all* stations with a connection to the system concerned, regardless of the identity and access rights of the current user.

Alarms and warnings can only be acknowledged from the control mode connection.

Messages are color coded

Alarms and warnings are displayed in the ***Logbook*** pane of the ***System Control*** module with different colors, see the illustration below.



- Warning messages are displayed in orange text.
- Alarm messages are displayed in red text.

Method instructions and manual instructions override system settings

Limits for certain monitor signals can also be set locally in a method, if allowed by the system strategy. In such case, the method setting (method instruction) overrides the system setting as long as the method is running.

Example: This feature allows for instance the pH warning limit to be set to one value during process operation and another during system cleaning.

Note: Manual instructions also override the system settings.

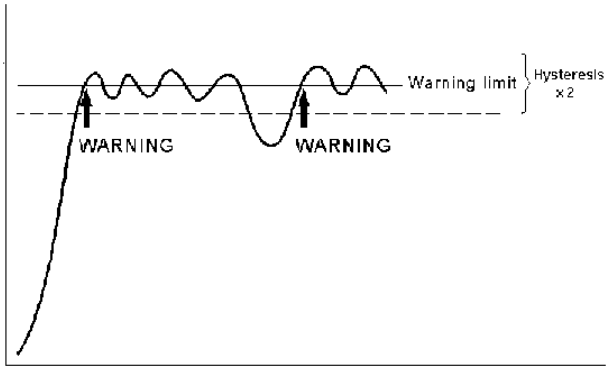
Settings must be enabled

Alarms are not active unless the mode is set to ***Enabled***. Verify the alarm mode for each instruction line in the list.

Hysteresis

The hysteresis setting (not available for ÄKTAdesign systems) for a warning determines the extent to which the signal can oscillate around the warning limits without re-activating the warning.

After the signal has activated a warning, the warning will not be repeated as long as the signal remains within a window defined by the hysteresis setting above and below the warning limit. This prevents repeated warnings from noisy or oscillating signals close to the warning boundary. See the illustration below.

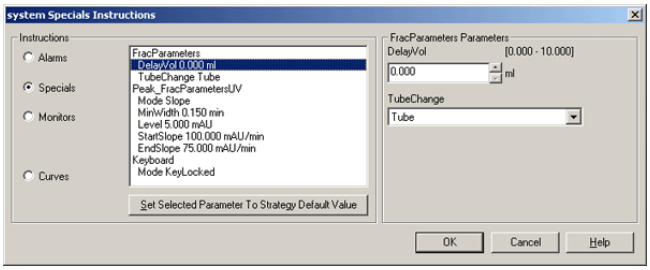


Note: Hysteresis is only relevant for warnings, since an alarm puts the system in ***Pause*** at the first alarm.

7.3 Specials settings

The Specials settings

The figure below shows the ***Specials*** settings which are available in the ***Instructions*** dialog box in the ***System Control*** module.



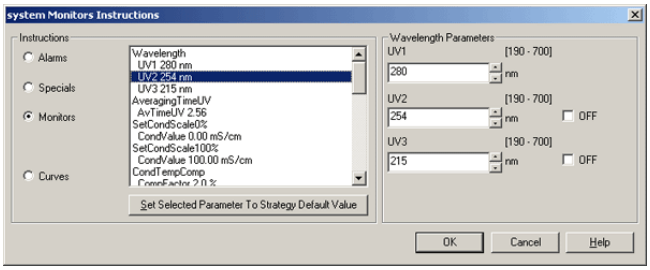
The ***Specials*** settings include for example instructions for fraction collectors.

Note: How to open and use the ***Instructions*** dialog box is described in *Section 7.1 The Instructions dialog box, on page 192*.

7.4 Monitors settings

The Monitors settings

The figure below shows the ***Monitors*** settings which are available in the ***Instructions*** dialog box in the ***System Control*** module.



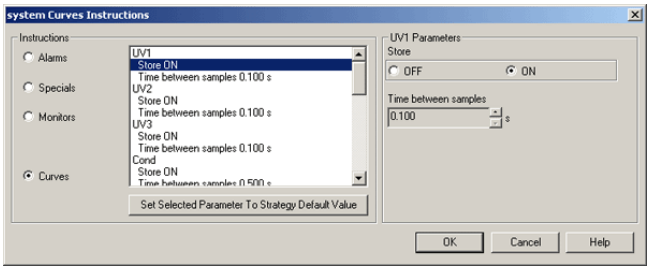
The instructions and parameters depend on the selected monitors.

Note: How to open and use the ***Instructions*** dialog box is described in *Section 7.1 The Instructions dialog box, on page 192*.

7.5 Curves settings

Introduction

This section describes the ***Curves*** settings which are available in the ***Instructions*** dialog box in the ***System Control*** module.



Note: How to open and use the ***Instructions*** dialog box is described in *Section 7.1 The Instructions dialog box, on page 192*.

The Curves parameters

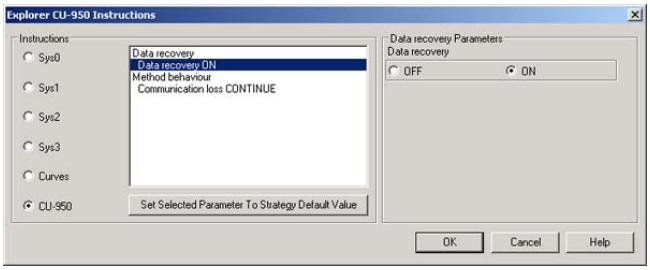
The table below describes two parameters in the ***Curves*** settings:

Parameter	Description
Store	Determines whether or not the curve data is stored in a result file in UNICORN. *Caution!* Check that ***Store*** is set to ***ON*** for all signals that are to be stored. If a curve is set to ***OFF***, data from the monitor concerned cannot be displayed in the curves window during a process run and will not be recorded in any way.
Time between samples	Determines the frequency with which curve data is recorded in UNICORN (this does not affect the reading frequency of the monitor itself). The default setting is for the shortest possible time between samples.

7.6 CU-950/CU-960 settings

Introduction

This section describes the ***CU-950/CU-960*** settings which are available in the ***Instructions*** dialog box in the ***System Control*** module.



Note: How to open and use the ***Instructions*** dialog box is described in *Section 7.1 The Instructions dialog box, on page 192*.

Only CU-950/CU-960 Advanced settings can be changed

CU-950/CU-960 Advanced

The CU-950/CU-960 settings are only visible in the ***Instructions*** dialog box if the CU-950 Advanced controller or CU-960 Advanced controller is installed. The CU-950 Advanced or the CU-960 Advanced is connected to the Ethernet connection of the computer.

CU-950/CU-960 USB

If a CU-950 USB or a CU-960 USB controller is installed, the settings cannot be changed and always have the following values:

- Data recovery = ***OFF***
- Method behaviour = ***PAUSE***

Data recovery instruction

The illustration below shows the parameter of the ***Data recovery*** instruction.

Note: In this case there is only one parameter and it has the same name as the instruction.

Data recovery parameter

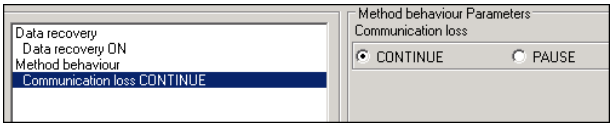
If the connection between the PC and the CU-950/CU-960 is lost during a method run and ***Data recovery*** is set to

- ***ON***, the run data is saved in the CU.
- ***OFF***, the run data is lost.

Note: You cannot set the parameter to ***ON*** unless there is a memory card installed in the CU.

Method behaviour instruction

The illustration below shows the parameter of the ***Method behaviour*** instruction.



Communication loss parameter

If the connection to the instrument is lost during a method run and ***Communication loss*** is set to

- ***CONTINUE***, the method run will continue to execute until end is reached.
- ***PAUSE***, the method run will pause. When the connection is reestablished you have to click ***Continue*** to resume the run.

8 Troubleshooting

Introduction

This chapter describes different operational scenarios which may arise in UNICORN and their solutions or consequences.

In this chapter

This chapter contains these sections:

Section	See page
8.1 Advice on operation: Logon	203
8.2 Advice on operation: UNICORN access	206
8.3 Advice on operation: Methods	209
8.4 Advice on operation: Evaluation	213
8.5 Advice on operation: ÄKTAdesign systems	214
8.6 Advice on operation: CU-950/CU-960	215

8.1 Advice on operation: Logon

In this section

This section describes

- how to log on to UNICORN
- the following logon scenarios
  - Unable to log on to UNICORN
  - Error message "Strategy file error".

How to log on

The table below describes how to log on to a system.

Step	Action
1	Start UNICORN.

Step	Action
2	• Choose your user name from the Username drop-down list in the ***Logon*** dialog box: • Type your password in the ***Password*** field. • Click ***OK***.

Note: If you have forgotten your password, ask the system administrator for a new one.

Unable to log on to UNICORN

Scenario	Solution
Username and password not accepted You cannot log on although you use your correct username and password. *Possible reason*: The file `USERS30.MPM` in the folder `\UNICORN\SERVER\FIL` could be corrupt.	• Restore the file USERS30.MPM from the latest back-up copy *- or -* • reinstall the default user.

Scenario	Solution
No user names: Remote station Both these conditions must apply: • The ***User name*** drop-down box in the ***Logon*** dialog box is empty. • You are trying to log on from a remote station in a network installation.	Make sure that the computer is logged on to the network before you start UNICORN. **Note:** A remote station accesses the user list directly from the network server.
No user names: Local station The user list on a local station in a network installation is not up to date.	Make sure that the computer is logged on to the network before starting UNICORN. **Note:** The user list is stored locally on a local station, and is updated automatically from the network server if the computer is logged on to the network.

Error message "Strategy file error"

Scenario	Solution
Stand-alone installation If you receive the error message ***Strategy file error*** in a stand-alone installation, the strategy file is probably corrupt.	Reinstall the strategy as described in *Section 2.3.5 Define a system after UNICORN 5.31 is installed, on page 84*.
Network installation In a network installation, the error message ***Strategy file error*** may appear if you try to create a method for a system not physically connected to the computer.	Make sure that the computer is logged on to the network before UNICORN is started, so that the strategy file on the server disk is accessible.

8.2 Advice on operation: UNICORN access

In this section

This section describes the following UNICORN access scenarios:

- Unable to access certain UNICORN functions
- Connection scenarios
  - Connections are not available
  - System is not available
  - Error message in a network installation
  - You cannot control the system
- Run data Connection in System Control displays a "NO [1]", "NO [2]" or "NO [3]".

Unable to access certain UNICORN functions

Scenario	Solution
UNICORN functions to which you do not have access appear grey in the menu and cannot be used.	Choose ***Administration:User Setup*** in the ***UNICORN Manager*** to change the user profile.
The ***Manual*** menu commands in the ***System Control*** are grey, that is you can establish a connection but cannot control the system.	• Check that no other user has a control mode connection. • Check that you have access rights to control the system manually.

Connection scenarios

Scenario	Solution
The connections are not available.	• Check the connection between the PC and the chromatography system. • Check that the power to the chromatography system is turned on.

Scenario	Solution
The connections are not available even though • the connection between the PC and chromatography system appears to be correct • the power is turned on.	• Switch off the chromatography system. • Quit UNICORN. • Shut down and restart the computer.
A system is not available when you attempt to establish a connection.	Check that you have access rights to the system. Access rights are not automatically assigned for a newly defined system.
You receive the error message "Cannot connect to system..." in a network installation.	• Check that the local computer to which the system is connected is turned on and logged on to the network. • Check that the computer from which you try to establish a connection is logged on to the network. • Check that the limit of 8 connections to the system has not been exceeded.
No contact between the ***System Control*** and the system. *Possible reason*: Sometimes this can be due to the fact that named pipes cannot be used. Then you have to enable sockets instead of named pipes.	• In the ***UNICORN Manager***, choose ***Administration:System Setup...*** to open the ***System Setup*** dialog. • Click the ***Socket*** button and check the check box in the ***Socket*** dialog. • Click ***OK*** then the ***Close*** button. • Restart all the UNICORN computers in the system table.
Socket communication fails and the OCI crashes at start-up. *Possible reason:* The port number assigned in the ***Socket*** dialog box is used by another application.	• Change the port number in the ***Socket*** dialog box. • Restart all the UNICORN PCs in the network. **Note:** To check which port numbers are busy you can type the command `netstat` in the Windows ***Command Prompt*** window.

Note: If you cannot establish a connection to the network server you can still continue to work from the local station and use the ***Method Wizard*** to create methods. See the ***User Reference Manual*** for more information.

The Connection field in System Control displays a "NO [1]", "NO [2]" or "NO [3]".

Scenario	Solution
The ***Connection*** field in the ***Run data*** pane in ***System Control*** says "NO [1]" or "NO [2]".	• Choose ***Administration:System Setup*** in the ***UNICORN Manager***. • Select the system with problems in the dialog box and click the ***Edit*** button. • Check that the strategy, computer name and the control unit number are correct according to the installation at the local station which is physically connected to the system. See *Section 6.2.1 System definitions, on page 135*.
The ***Connection*** field in the ***Run data*** pane in ***System Control*** says "NO [3]".	• Choose ***Administration:System Setup*** in the ***UNICORN Manager***. - Select the system with problems in the dialog box and click the ***Edit*** button. - Check that the strategy, computer name and the control unit number are correct according to the installation at the local station which is physically connected to the system. See *Section 6.2.1 System definitions, on page 135*. • If you connect remotely to a system - check that the local station which is physically connected to the system is turned on - check that the network is functioning at both the remote and the local station. • Check that the limit of eight connections to the system has not been exceeded.

8.3 Advice on operation: Methods

In this section

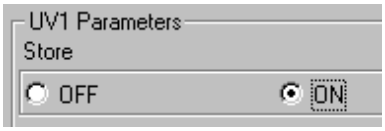
This section describes the following method scenarios:

- Cannot perform ***Quit*** or ***Logoff***
- Monitor signals do not appear in the Curves pane in ***System Control***.
- Error message "Couldn't create result file... Destination path could not be found"
- The ***Method-System Connection*** dialog box keeps appearing.
- The ***Method Editor*** window does not fit on the screen.
- There are red instructions in a method.
- After Windows logout and login you cannot get a system connection.
- The ***Print screen*** command does not send a copy of the screen to the printer.

Cannot perform Quit or Logoff

Scenario	Solution
You are unable to perform ***Quit*** or ***Logoff*** from UNICORN for a connection.	You might be running a ***Scouting*** method or a ***MethodQueue***. These functions require a control mode connection in order to start subsequent cycles correctly. *Action*: Stop the ***Scouting*** method or ***MethodQueue*** before you quit or log off.

Monitor signals do not appear in the Curves pane in System Control

Scenario	Solution
Monitor signals do not appear in the ***Curves*** pane in ***System Control***.	• Choose ***System:Settings:Curves*** in ***System Control*** • Set the ***Store*** option to ***ON***.  Signals for which ***Store*** is set to ***ON*** can be selected from the ***View:Properties:Curves*** dialog box in ***System Control***.

Error message "Couldn't create result file... Destination path could not be found"

Scenario	Consequence
If you receive the error message ***Couldn't create result file... Destination path could not be found*** at the end of a method, the local computer was unable to access the folder specified in the result file path.	This may happen if the specified folder is on the network server and network communication has been lost. The result file is instead saved in the ***Failed*** folder on the local station.

The Method-System Connection dialog box keeps appearing

Scenario	Solution
If the ***Method-System Connection*** dialog box keeps appearing you have one or more methods that are not connected to a system. *Reason*: Most likely you have imported one or more methods with the command ***File:Copy from External*** in the ***UNICORN Manager***.	Connect the method(s) to the appropriate system.

The Method Editor window does not fit on the screen

Scenario	Solution
The ***Method Editor*** window does not fit the screen and has scroll bars. *Reason*: The incorrect font size might be installed.	• You need to install ***Small fonts*** instead of ***Large fonts***. This requires that you have the Windows CD-ROM that was shipped with your Compaq computer. • Insert the CD-ROM and follow the directions on the screen.

There are red instructions in a method

Scenario	Solution
Red instructions (instructions with a red dot) in a method are syntax errors and may be due to the following: • The method was connected to the wrong system, that is the strategy of the system is incompatible with the method. • The ***Copy*** function was used instead of ***Copy from external*** when a method was imported from a disk. • The wrong system may have been selected in the ***Save As*** dialog box in the ***Method Editor***. • You may also have templates not intended for your system, which might be the case for custom designed systems. • The systems strategy has been updated with a new strategy that differs in the instruction set.	There are several actions that you can take: • Check that the method has been connected to the correct system in either of these ways: - in the ***System Method Connection*** dialog box when you use the ***Copy from external*** dialog box - in the ***Save As*** dialog box in ***Method Editor***. • If the system is custom designed, go to the ***Method Editor***, select the red instruction and either delete it or replace it with a corresponding instruction (if available) from the ***Instruction box***. Repeat this for all red instructions before saving the method.
The method instructions do not correspond to the components you have chosen for your system.	Check your system components under ***Administration:System Setup*** in the ***UNICORN Manager***.

After Windows logout and login you cannot get a system connection

The scenario below applies to local systems only, not remote systems.

Scenario	Solution
You have logged out of Windows and then logged in again, but you cannot get a system connection in UNICORN. *Reason*: If you shut down Windows with the command ***Start:Shutdown:Close all programs and log in as a different user***, you will not be able to obtain a System Control connection in UNICORN the next time you or another user logs on. This is because this shutdown procedure automatically shuts down a number of processes, including those needed for system connection. The services are only started when the computer is booted up.	Restart the computer in order to obtain a system connection in UNICORN.

Print screen does not send a copy of the screen to the printer

Scenario	Solution
The ***Print screen*** command only makes a copy of the screen to the clipboard and not to the default printer.	If you want to print the view on the screen, press the ***<Print Screen>*** key and paste the image from the clipboard into an appropriate program, such as Microsoft Paint, and then print out the image.

8.4 Advice on operation: Evaluation

In this section

This section describes the following evaluation scenarios:

- Incorrect date and time in the result file
- Evaluation procedure aborts

Incorrect date and time in the result file

Scenario	Solution
The result file shows incorrect date and time.	The date and time recorded in the result file are taken from the PC system clock settings. *Action*: Check the system clock settings.

Evaluation procedure aborts

Scenario	Solution
The evaluation procedure aborts.	Instructions in an evaluation procedure refer to curves by identification number irrespective of the curve names. Make sure that the curves processed when the procedure is executed are compatible with those processed when it was recorded. An evaluation procedure aborts if you try to store resulting curves at the position of an original raw data curve.

8.5 Advice on operation: ÄKTAdesign systems

In this section

This section describes the following ÄKTAdesign system scenarios:

- Connected to a system but no system contact
- Flow scheme does not display properly

Connected to a system but no system contact

Scenario	Solution
You are connected to a system but have no system contact. *Indications*: In the ***System Control***, • the option ***Connection*** in the ***Run data*** pane says "Yes" • the option ***Instruments*** says "Scanning" • there is no contact with the system after a period of waiting.	• Check that the chromatography system is turned on. • Check that all cable connections are intact. • If the above actions do not help, try to restart both the computer and the system.

Flow scheme does not display properly

Scenario	Solution
The flow scheme is not displayed properly	Choose ***Settings:Control Panel: Display:Settings*** in the Windows Start menu to check that you have selected 65536 colors.

8.6 Advice on operation: CU-950/CU-960

In this section

This section describes the following CU-950/CU-960 scenarios:

- Data recovery ***OFF*** at connection loss
- End is reached during connection loss
- CU-950/CU-960 USB cable is unplugged
- The PC hard drive crashes during a run

Data Recovery OFF at connection loss

Scenario	Solution
The connection between the PC and CU-950/CU-960 is temporarily lost during a method run. When the connection is reestablished, incorrect time and volume is shown. **Note:** Either CU-950/CU-960 USB is used or CU-950/CU-960 Advanced with Data Recovery set to ***OFF***.	To be able to maintain correct time and volume after connection loss the CU-950/CU-960 Advanced must be used with Data Recovery set to ***ON***

End is reached during connection loss

Scenario	Consequence
End of run is reached either • during connection loss *or* • during data upload after connection loss.	The time stamp indicating the time of day (not the method time) will indicate the time when the message reached the PC.

CU-950/CU-960 USB cable is unplugged

The table below describes a CU-950/CU-960 USB scenario.

Scenario	Solution
A CU-950/CU-960 USB is connected to the PC and the USB cable gets unplugged for some reason	Systems operating Windows XP: • Replug the cable into the PC.

CU-950/CU-960 USB connection fails

Scenario	Solution
The USB cable is connected at the wrong time/The CU is restarted at the wrong time.	1 Connect the CU power cord. 2 Wait until the CU **Power** LED lamp is on and the **PC** and **System** LED lamps are blinking. 3 Connect the USB cable. **Note:** Do not connect the USB cable again until the PC LED lamp is blinking if the USB cable is removed while the CU is connected to a system. You should not interrupt the initializing of the CU, but wait until the firmware has been downloaded and the CU is restarted. If UNICORN processes are on, do not start TCC until all three LED lamps are on. Should the connection fail because the points above were not observed, disconnect the cables and reconnect as described above.

The PC hard drive crashes during a run

The table below describes a CU-950/CU-960 Advanced scenario.

Scenario	Solution
• The unlikely event that the hard drive crashes unrecoverably during a run. • The CU-950/CU-960 Advanced is used, which stores the run data on its memory card.	In order to retrieve the data from the CU-950/CU-960 Advanced you need to • recover the backup files from the damaged hard drive if it is possible and move them to another PC • move the CU-950/CU-960 to the other PC and restart the PC.

Appendix A Technical specifications

Introduction

This appendix describes

- the UNICORN system recommendations
- UNICORN's capability to control chromatography systems
- how UNICORN samples data from the chromatography systems.

In this appendix

The table below describes the contents of this appendix:

Section	See page
A.1 System recommendations	219
A.2 UNICORN control capacity	221
A.3 Data sampling	222

A.1 System recommendations

Introduction

This section describes the following in the UNICORN system:

- Hardware recommendations
- Software recommendations
- Network recommendations

Hardware recommendations

The table below describes the recommended hardware for a UNICORN system:

Component	Recommendations
PC	Pentium 4, 2.5 GHz or higher
Memory	• Windows XP: 512 MB RAM or more • Windows 7: 2 GB RAM or more
Hard disk	• Windows XP: 1 GB or more space available • Windows 7: 2 GB or more space available
Monitor	Color monitor: 1024x768 pixels, small fonts, 64K colors
Controller	• CU-950 USB requires a USB 1.1 port • CU-950 Advanced requires a 10Mbps network interface card • CU-960 USB requires a USB 1.1 port • CU-960 Advanced requires a 10Mbps network interface card **Note:** ÄKTAprime and ÄKTAxpress instruments do not connect to the PC through a controller. ÄKTAprime is connected directly to the serial port on the PC and ÄKTAxpress is connected to the PC via USBcan II.
Drives	CD-ROM drive
Peripherals	Mouse

Component	Recommendations
Printer	The printer which is delivered together with the system from GE Healthcare. **Note:** New printer models are added on a regular basis and therefore cannot be specified beforehand.

Note: ÄKTAprocess systems are delivered with a special control PC.

Software recommendations

The table below describes the recommended operating systems for workstations running the UNICORN software.

Item	Recommendations
Operating system for the workstations	• Microsoft Windows XP Professional SP3 or • Microsoft Windows 7 Professional

Note: The UNICORN 5.30 version is only compatible with 32-bit operating systems.

Network recommendations

The table below describes the network recommendations for UNICORN in a network installation:

Item	Recommendations
Network protocols	• Client for Microsoft Networks • File and Printer Sharing for Microsoft Networks • Internet Protocol (TCP/IP)
Services	Server and Workstation

Note: The last two points ensure that named pipes are usable over the network and that folders can be connected to a drive unit.

A.2 UNICORN control capacity

Introduction

This section describes UNICORN's capability to control systems in stand-alone installations and network installations.

Stand-alone installations

In a stand-alone installation the computer can be connected to a maximum of

- 12 ÄKTAxpress systems
- 4 systems of other types than ÄKTAxpress.

Network installations

The list below describes some basic facts about network installations:

- Systems must be locally linked to a workstation which is linked to the network. In other words, the systems are not *directly* linked to the network.
- Each local workstation can be connected to a maximum of
  - 12 ÄKTAxpress systems
  - 4 systems of other types than ÄKTAxpress.
- A network can support up to 99 chromatography systems which are connected locally to the workstations in the network.
- A workstation can locally or remotely control up to four chromatography systems. This is achieved using the four possible ***System Control*** windows in UNICORN which are available on each workstation.
- Each chromatography system in UNICORN
  - can be *controlled* by only one active ***System Control*** window
  - can be *viewed* by up to eight ***System Control*** windows.

A.3 Data sampling

Data storage

Data from chromatography system monitors is stored temporarily in data buffers in the local system controller. Data is transferred from the buffers to disk storage by UNICORN whenever a chromatogram is closed, that is when the ***New_Chromatogram*** instruction is issued or the result file is closed.

Data is also saved to disk at pre-set intervals during a run, thus minimizing data loss in the event of power or communication failure.

Data buffer capacity

The capacity of the data buffer is 16000 points for up to sixteen monitors.

Note: The data buffer capacity is listed in the ***Curves*** group of ***System:Settings*** in ***System Control*** module.

Effective sampling frequency

If a buffer is filled during a run, i.e. 16000 points have been recorded, the number of points is halved by deleting every second point, leaving 8000 points on the chromatogram. For subsequent sample points, every second point is dropped, thus halving the effective sampling frequency. When the chromatogram again reaches 16000 points the process is repeated and the effective sampling frequency is halved once again. Now every fourth sampling point will be recorded.

Note: The real sampling frequency, the sampling frequency of the card, never changes.

Initial effective sampling frequency

The initial effective sampling frequency for each monitor is set in the system strategy. It can be viewed and changed in the ***Curves*** group of ***System:Settings*** in ***System Control***.

Note: For ÄKTAxpress systems, the sampling frequency cannot be viewed or changed.

Resolution at 10 Hz sampling frequency

The table below describes the resolutions that apply for the curves at an initial effective sampling frequency of 10 samples per second (10 Hz):

Duration [minutes]	Card sampling frequency [Hz]	Effective sampling frequency [Hz]	Number of points	Resolution [seconds/point]
0-27	10	10	0-16000	0,1
27-53	10	5	8000-16000	0,2
53-107	10	2,5	8000-16000	0,4
107-203	10	1,25	8000-16000	0,8

How to ensure maximum resolution

To ensure maximum resolution for a part of a run, issue a ***New_Chromatogram*** instruction at the beginning of the part. This empties the data buffers and resets the sampling frequency to the value specified in the system settings.

Index

A

Access
- Define access to systems and folders, 180

Access groups
- Functions, 116
- General description, 162

Access groups, edit
- How to edit, 164

Access to systems
- Advice on operation, 206

Accidental shut-down
- How to avoid, 124

Administration areas
- Descriptions, 132

Administrator responsibilities
- Prepare the program for users, 132

ÄKTAdesign system
- Advice on operation, 214

Alarms
- Enable alarms, 195
- Settings, 194
- Warning and alarm limits, 194

Audit trails
- Display the system run hours, 154
- Global view, 146
- How to back up, 153
- How to print, 151
- How to renew, 152
- How to search for text, 150
- How to view, 146
- How to view older files, 149
- System view, 146

C

Calibration
- ÄKTAdesign monitors, 112
- Continuous, 111
- Methods for calibration, 110
- One-point calibration, 111
- pH monitor, 112
- Two-point calibration, 111

Connection
- General information, 100
- How to connect to a system, 101
- How to disconnect a system, 107
- How to lock a system, 117
- Local, 102
- Modes, 103
- Remote, 102

CU-960
- Advice on operation, 215
- Hardware installation, 38
- Settings, 200
- System setup, 58, 87

CU-950
- Advice on operation, 215
- Hardware installation, 36
- Settings, 200
- System setup, 58, 87

Curves settings
- Parameters, 199

D

Data sampling
- Ensure maximum resolution, 223
- Frequency, 222
- Resolutions at 10 Hz initial frequency, 223
- Storage, 222

F

Failed folder
- How to retreive the results, 119
- Policies for access, 120

Folders
- How to delete, 188
- How to delete special folders, 189

H

Hardware installation
- CU-960, instructions, 38
- CU-950, instructions, 36

When is installation neccessary?, 35
Home folder
How to delete, 189
Home folders
Create subfolders, 174
General information, 173

I

Installation
Overview of complete procedure, 33

L

Leave and lock system
How to, 105
Local station failure
Auto save feature, 123
Systems with CU-950/CU-960 Advanced controllers, 122
Systems without CU-950/CU-960 Advanced controllers, 123
Local workstation
Definition, 7
Logon
Advice on operation, 203

N

Network administrator
Responsibilities, 6
Security responsibilities, 6
Network communication failure
Between local station and CU-950/CU-960 Advanced, 121
Remote station, 119
Network setup
Connect Windows 7 workstation to domain, 26
Connect Windows XP workstation to domain, 15
Example illustrated, 10
General information, 8
How to enable sockets and disable named pipes, 8
Install network components in Windows 7 workstations, 23
Install network components in Windows XP workstations, 14
Install Unicorn on a Windows 7 workstation, 31
Install Unicorn on a Windows XP workstation, 17
Map shared folder in Windows 7 workstation, 30
Map shared folder in Windows XP workstation, 16
Network components to install in Windows 7 workstations, 22
Network components to install in Windows XP workstations, 14
Network control capacity, 221
Set user rights in Windows 7 workstations, 18
Set user rights in Windows XP workstations, 12
Network terms
Explanations, 7

P

Passwords
Administrator change for other user, instruction, 184
How to change, 186
Rules and recommendations, 184

R

Remote workstation
Definition, 7

S

Settings
Alarms, 194
CU-960, 200
CU-950, 200
Curves, 199
Monitors, 198
Specials, 197
The Instructions dialog box for systems settings, 192
The Options dialog box for systems settings, 125

Software installation
Disable network interface card power settings, 94
Disable Windows 7 power save settings, 92
How to install UNICORN, basic instruction, 46
Installation for ÄKTAxpress, instruction, 65
Install strategy files after installation, 84
Install strategy files at installation, 55, 75
Prerequisites for UNICORN installation, 44, 64
Prerequisite software applications, 46, 66
Repair or remove installation, 83
Select destination folder for the installation, 49, 68
Upgrade a previous UNICORN installation, instruction, 80
Strategy files
Add more after installation, 84
Installation, 55, 75
System administrator
Responsibilities, 6
Security responsibilities, 6
System definitions
Back up, 157
Define systems after completed installation, 84
Restore, 159
UNICORN computer name, 135
System recommendations
Hardware, 219
Network, 220
Software, 220
System run hours
How to display, 154
System setup
How to create a new definition, 137
How to edit a definition, 138
Possible selections, 136

U

User access
Password rules, 116
User Account Control
How to disable on Windows 7, 41
How to enable on Windows 7, 97
User attributes
Administrator change for other user, instruction, 185
How to change, 187
User properties
Access items, 163
Define access to folders, 180
Define access to systems, 180
Define attributes, 178
Define the advanced items, 179
Edit the user definition, 177
Home folders, 173
How to create a new user, 171
How to delete a user, 188
How to edit access groups, 164
Print user setup information, 183
The default user, 169
The User Setup dialog box, 163
User access groups, 162

W

Windows 7 User Account Control
How to disable, 41
How to enable, 97

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