



# UVD 170U and UVD 340U UV/VIS Detectors

## Operating Instructions



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## Declaration of Conformity

**Product:** UV/VIS Detector  
**Type:** UVD 170U/340U

Dionex GmbH herewith declares conformity of the above products with the respective requirements of the following regulations:

- Low-Voltage Equipment Directive 73/23/EEC  
changed by 93/68/EEC
- EMC Directive 89/336/EEC  
changed by 91/263/EEC; 92/31/EEC; 93/68/EEC

The electrical safety of the products was evaluated based on the following standard:

- EN 61010-1:1993  
Safety requirements for electrical equipment for measurement, control, and  
laboratory use  
Part 1: General Requirements

The Electromagnetic Compatibility (EMC) of the products was evaluated based on the following standards:

- EN 50081-1:1992:  
Electromagnetic Compatibility (EMC) - Generic emissions standard  
Part 1: Residential, commercial, and light industry
- EN 50082-1:1992:  
Electromagnetic Compatibility (EMC) - Generic immunity standard  
Part 1: Residential, commercial, and light industry
- EN 61000-3-2:1998  
Electromagnetic Compatibility (EMC)  
Part 3 / Section 2: Limits for harmonic current emissions

This declaration is issued for the manufacturer

Dionex GmbH  
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by the President, Dr. Peter Jochum.  
September 27, 2001



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# 1 Introduction

## 1.1 How to Use This Manual

The layout of this manual is designed to provide quick reference to the sections of interest to the user. However, in order to obtain full understanding of the detectors, we recommend that you review the manual thoroughly before beginning operation. All descriptions in the manual apply to both the UVD 170U and UVD 340U detector. Therefore, the term "the detector" is used. If some detail applies to only one of the detectors, the detector is identified by name.

At various points throughout the manual, messages of particular importance are indicated by the following symbols:

 **Please note:** Indicates general information to optimize the performance of the instrument.

 **Important:** Indicates that failure to take note of the accompanying information may result in damage to the instrument.

 **Warning:** Indicates that failure to take note of the accompanying information may result in personal injury.

This manual is provided "as is". Every effort has been made to supply complete and accurate information and all technical specifications have been developed with the utmost care. However, Dionex assumes no responsibility and cannot be held liable for any errors, omissions, damage, or loss that might result from any use of this manual or the information contained therein. We appreciate your help in eliminating any errors that may appear in this document.

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## 1.2 Unpacking

All electrical and mechanical components of the detector are carefully tested before the instrument is shipped. After unpacking, please check the detector for any signs of mechanical damage, which might have occurred during shipment.

**i** **Please note:** Immediately report any shipping damage to both the incoming carrier and Dionex. The shipping insurance will compensate for the damage only if reported immediately.

**i** **Please note:** Keep the original packing material, as it is the optimum packaging for shipping the unit (e.g., for repair). Shipping the unit in any other packaging automatically voids the product warranty.

To unpack the detector, proceed as follows:

- Place the shipping container on the floor and remove the accessories pack.
- Grasp the detector by the sides. Slowly and carefully, pull it out of the shipping container and place it on a stable surface.
- Remove the foam inserts, and then remove the polythene packaging.
- Check off the contents of the accessory pack against the list in the Standard Accessories section, page 49.

## 1.3 Warranty

The standard warranty coverage for the unit is in accordance with the terms of sale. Warranty is given for one year, starting from the invoice date, and covers materials and labor, ex-works. Please note that worn-out parts are not covered by the warranty.

The warranty period for the deuterium lamp is six months, starting from the delivery date (see label at lamp cable). Removing the label automatically invalidates the warranty. The warranty period for lamps with timer (without the above label) is 1000 operating hours.

The warranty coverage does not include the flow cell.

The warranty coverage shall become invalid in any case identified as resulting from inappropriate use, service, or the implementation of non-specified spare parts. Similarly, the warranty coverage shall be invalidated in the event of inappropriate shipment, packaging, or failure to remove aggressive or damaging solvent residues.

## 1.4 Intended Use

The detector is a highly sensitive UV-VIS diode array detector designed to perform HPLC analyses with the Chromeleon Chromatography Management System. The UVD 340U detector allows the recording of three-dimensional data, in addition to the UV-VIS channels available on the UVD 170U detector.

Please note that the unit may be operated only using the accessories originally supplied with the detector (→ page 49) and within its technical specifications (→ page 47).

If there is a question regarding appropriate usage, contact Dionex before proceeding.

Dionex shall not be liable for any damage, material or otherwise, which is caused by inappropriate or improper use of the device.

## 1.5 Federal Communications Commission (FCC) Note

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the U.S. FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his expense.



## 2 Overview

### 2.1 Principle of Operation

The UVD170U and 340U detectors feature:

- Highest sensitivity
- Powerful optics
- Extremely low-noise electronics
- Simultaneous detection at four wavelengths
- Recording of three-dimensional data

**i Please note:** Recording of three-dimensional data is only possible with the UVD 340U detector and the corresponding Chromeleon PDA license.

- Maximum analysis efficiency, due to comprehensive data analysis capabilities in Chromeleon.

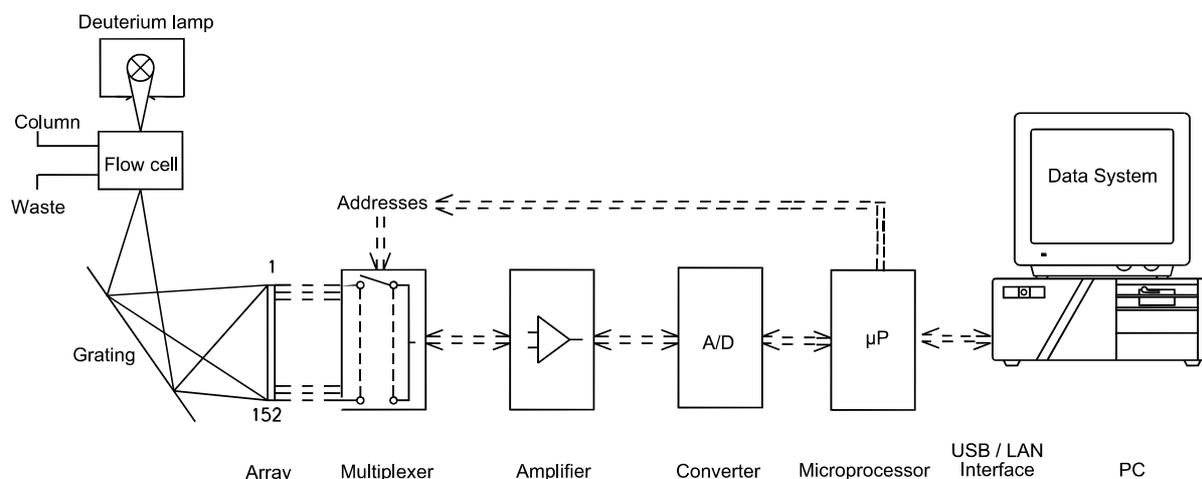


Fig. 1: Principle of operation

## 2.2 Flow Cells

**⚠ Important:** The chemical resistance of the flow cell depends on the solvents used for the analysis. This applies particularly to solvents that can form active radicals or peroxides.

**ℹ Please note:** All UVD 170/340-U detectors are shipped with a standard analytical flow cell (part no. 5065.1810).

The **standard analytical flow cell** (→ Fig. 21, page 42) is the choice for applications using 3 and 4 mm I.D. columns. The cell consists of a PEEK cell body and a heat exchanger equipped with a stainless steel capillary with an inner diameter of 0.25mm I.D. The inlet capillary is factory-fitted with a single-part, hand-tight fitting. The flow outlet capillary is made of PEEK and has an inner diameter of 0.50 mm. The cell volume is 10 µL and the cell path length is 9 mm. The maximum pressure limit of the standard analytical flow cell is 10 MPa (1450 psi).

For other fields of application, the following flow cells are available as an option:

- **Biocompatible flow cell** (Part no. 5065.1820)  
The biocompatible flow cell is recommended for applications using stainless steel incompatible eluents or analytes. It has almost the same design as the standard analytical flow cell. However, the stainless steel capillary is substituted by a PEEK capillary with an inner diameter of 0.25 mm. The cell volume is 10 µL and the cell path length is 9 mm. The maximum pressure limit for the biocompatible flow cell is 10 MPa (1450 psi).
- **Semi-Preparative flow cell** (Part no. 5065.1800P)  
This flow cell is recommended for semi-preparative applications using columns with an inner diameter, for example, of 25 mm. Often, highly concentrated samples and/or large injection volumes are used, resulting in high signal levels with standard cell path length, e.g., 9 mm. The path length of the semi-preparative flow cell is 2 mm. It has almost the same design as the standard analytical flow cell. However, the cell body is made of PCTFE. The inlet and outlet capillaries, with an inner diameter of 0.7 mm, are made of stainless steel. The cell volume is 6 µL and the maximum pressure limit for this flow cell is 10 MPa (1450 psi).

For applications with 2 mm I.D. columns, we recommend using the micro flow cell:

- **Micro flow cell** (Part no. 5065.1810M)  
The micro flow cell has almost the same design as the standard analytical flow cell. The cell volume is 2.5 µL and the cell path length is 9 mm. The maximum pressure limit for the micro flow cell is 10 MPa (1450 psi).

For applications with 1 mm I.D. columns, we recommend using the fused silica nano flow cell or the micro flow cell:

- **Fused silica nano flow cell** (Part no. 5065.1810N)  
Use the fused silica flow cell for applications for which peak separation and thus, the peak width is critical. The cell volume is 395 nL and the path length is 8 mm. The maximum pressure limit for the fused silica flow cell is 40 MPa (5800 psi).  
Please keep in mind that fused silica might be incompatible with special eluents, e.g., pH ≥ 12. In these cases, use the micro flow cell (see above).

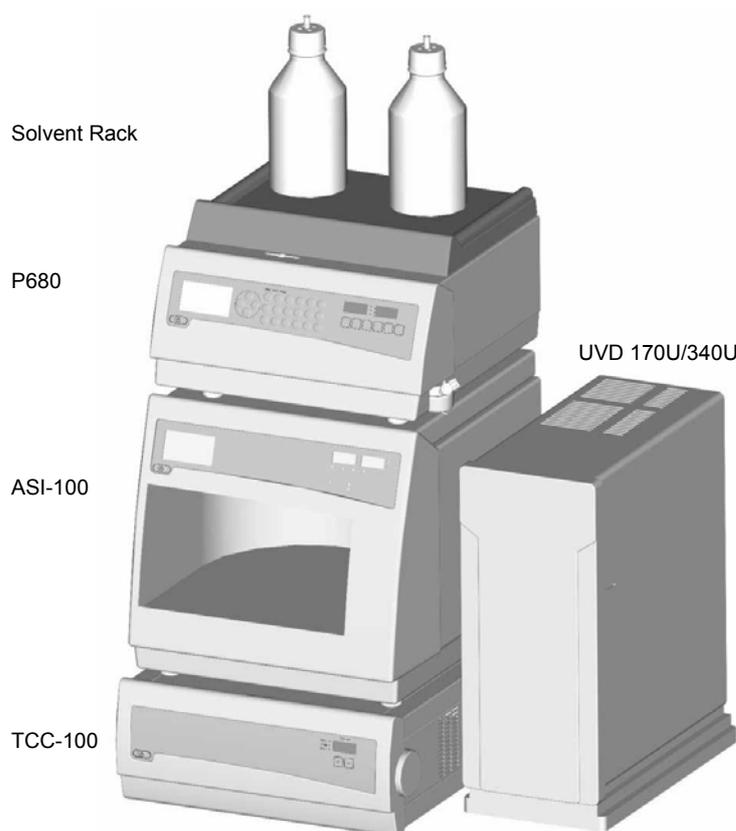
For information about how to clean the flow cells, refer to section 7.3.3 (→ page 43).

## 3 Installation

### 3.1 Positioning and Environment

Bring the detector to a moderate temperature for four hours to allow any condensation that might have occurred during shipping to evaporate. Do not connect the instrument to the mains yet. After four hours, check the instrument; if condensation is still there, allow the instrument to continue to warm up (without connecting it to the mains) until the condensation is completely gone.

Place the instrument on a firm and level surface that is free of vibration. Avoid large temperature variations in order to minimize the baseline drift. Avoid draughts and direct sunlight. Allow sufficient clearance behind the detector for power connections and ventilation. Capillary connections between the column and the flow cell should be as short as possible, to avoid peak broadening effects due to excessive dead volume.



*Fig. 2: Summit HPLC system with detector*

**⚠ Important:** Do not place any objects or stack additional instruments on top of the detector. The ventilation slits on top of the unit must remain unobstructed at all times.

## 3.2 Electrical Connection

### 3.2.1 Setting the Voltage Selector

Dionex instruments are factory-set for operation at the local voltage requirements of the destination country.



Fig. 3: Factory-set voltage selection, here: 230V

If the setting is not appropriate for your local requirements, reset the voltage at the selector on the instrument's rear panel (next to the main supply connector) as explained below:

**STOP Warning:** Before resetting the voltage, turn off the detector. Be sure to disconnect the power cord from its source.

- Remove the fuse cartridge using a small screwdriver (→ Fig. 4).



Fig. 4: Fuse cartridge

- Use small pliers or tweezers to pull the small voltage selector board out of the power socket housing (→ Fig. 5).



Fig. 5: Voltage selector board

- Place the board (with the writing face up) on a firm surface.
- Turn the board so that you see the correct voltage selection, as shown in → Fig. 6.
- Without turning the board, adjust the plastic clip as required for the mains voltage (→ Fig. 6). Make sure that the clip locks into position.

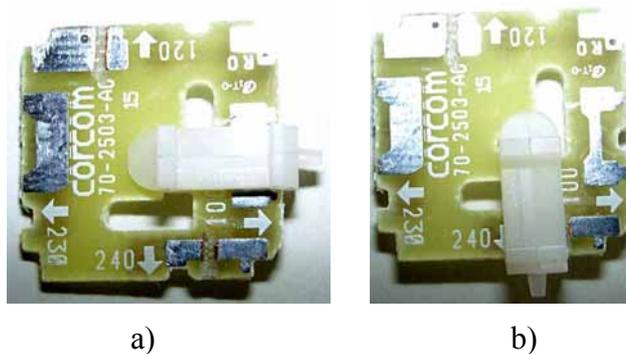


Fig. 6: Voltage selector board settings  
a) for 230 V and b) for 115V

**i Please note:** Set the voltage selector as follows:  
For a voltage of 90V-130V: Set the selector to 100 or 120  
For a voltage of 200V-240V: Set the selector to 230 or 240.

- Reinstall the voltage selector board in the power socket housing.
- If necessary, install new fuses of the correct rating (→ page 10).
- Reinstall the fuse cartridge and check that the correct voltage is set.

**⚠ Important:** During initial installation of the detector, check the correct power supply, the grounding, and the fuses.

**i Please note:** For minimum interference effects, all components of the analytical system should be connected to the same mains output (same phase).

### 3.2.2 Replacing the Fuses

To replace the fuses, follow the steps below:

**STOP Warning:** Before replacing the fuses, turn off the detector. Be sure to disconnect the power cord from its source.

- Remove the fuse cartridge, using a small screwdriver (→ Fig. 4).
- Replace the fuses with fuses of the appropriate rating.



Fig. 7: Fuses

**⚠ Important:** Use only the fuses indicated below or those listed in the Optional Accessories and Spare Parts list (→ page 50).

Voltage	Description	Part-Nr.
230V*	Fuse 1A, slow, 5x20mm, 250V	Included in "UVD Fuses Kit", part no. 6065.9002
115V**	Fuse, 2A, slow, 5x20mm, 250V	

\* The voltage selector is set to 230V or 240V.

\*\* The voltage selector is set to 100V or 120V.

- Reinstall the fuse cartridge.
- Reconnect the power cord to its source and turn on the detector.

### 3.3 Rear Panel Connections

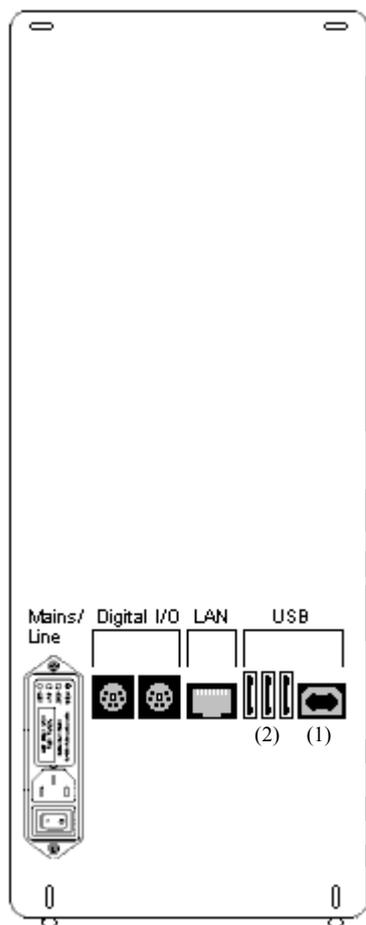


Fig. 8: Rear panel view

The Chromeleon Chromatography Management System can use either a LAN or USB connection to control the detector.

Data transfer is digitally via the respective cables (USB cable, part no. 8911.0002; LAN cable, part no. 8906.2038) that are connected to the instrument's rear panel.

**⚠ Important:** To ensure trouble-free operation, only use the original connection cables (see above) and USB extension cables (part no. 8911.0004) that are available from Dionex.

For more information about the single ports, see below.

#### USB

The detector is connected to the server PC via the USB port (1), i.e., either directly to the USB port of the PC, or via another instrument of the Summit HPLC product line that is already connected to the server PC, or via a USB hub.

The other three USB ports (2) allow the detector to be connected to either one instrument of the Summit HPLC line or one USB hub each. Additional Summit HPLC instruments can then be connected to the hub.

**⚠ Important:** We recommend using these USB ports (2) for connecting Dionex instruments only. Dionex cannot guarantee correct functioning if instruments of other manufacturers are connected.

The two digital inputs can be used to inform Chromeleon about external events. The relay outputs allow potential-free switching of external signals.

## LAN

The LAN port allows connection of the detector to an instrument LAN.

## Digital I/O

The two 6-pin ports (Mini-DIN) on the detector rear panel can be used under Chromeleon, as necessary, for communication with external instruments, e.g., to synchronize the Inject Signal of an external autosampler or injection valve with the start of the analysis start by the data system.

**i Please note:** If the detector is connected to Chromeleon via LAN, it is not advisable to use the digital inputs for remote inject synchronization. This is because the timing of LAN communication varies, depending on the current LAN traffic.

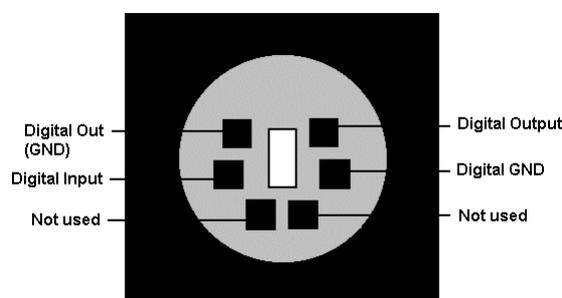


Fig. 9: Digital I/O port (View from the rear)

	Range
Digital Input ↔ Digital GND	0 or +5V
Digital Out (GND) ↔ Digital Output	Switching voltage: 100V; switching current: 0.5A Limiting value of mean on-state current: 1.0A Switching capacity: 10W/10VA Volume resistance: max. 0.15 Ohm

A 6-pin signal cable (Mini-DIN) (part no. 8911.0001) is available for connection. The **Analog High**, **Analog Low**, and **Shield** pins on the connection cable are not supported.

### 3.4 Fluid Connections

The capillary connections of the detectors are located on the left side of the detector (→ Fig. 20). The input capillary is black. Connect the capillary to the column output.

 **Important:** The maximum pressure stability of the flow cell depends on the model. The maximum pressure limit for the standard flow cell is 10 MPa (1450 psi). For information about the pressure stability of the other flow cell that are provided for the UVD-U detectors, refer to Technical Specifications (→ page 47).

 **Important:** The flow cell is primed with 2-propanol.

 **Please note:** Make sure that capillary connections between the column and the flow cell are as short as possible. This will avoid peak broadening effects due to excessive dead volume.



## 4 Operation

The detector is intended for operation with the Chromeleon Chromatography Management System. Stand-alone operation is not possible. Data transfer is performed digitally, via USB or LAN (→ Rear Panel Connections, page 11 and USB Installation, page 17 and/or LAN Installation, page 18).

### 4.1 Power-Up

The detector is turned on via the power switch on the rear panel of the instrument.

**i Please note:** The deuterium lamp does **not** switch on automatically when the power to the detector is turned on. Lamp on/off control is via Chromeleon. For optimum results, turn on the lamp at least 30 minutes before beginning an analysis.

**i Please note:** After selecting the **Lamp off** command, wait at least 5 minutes before turning on the deuterium lamp again. Otherwise, the lamp becomes too hot and may be damaged (message "Lamp too hot...").

### 4.2 Front Panel Status LED

The two-colored front panel LED indicates the status of the detector when the power is turned on:

LED	Status
A red light is flashing.	The detector is not yet connected to Chromeleon.
A red light is burning.	The detector is connected to Chromeleon (firmware started).
A green light is flashing.	Deuterium lamp is preheating.
A green light is burning.	Deuterium lamp is on.

### 4.3 Operation after Power Failure

If the HPLC system is operated under Chromeleon, the system can be programmed via the corresponding program file (PGM File) in such a way that operation is started again as desired after a power failure. For more information, see the Chromeleon online Help and the Chromeleon manual.



## 5 Automated Control by Chromeleon

### 5.1 General

If desired, Chromeleon, the Dionex Chromatography Management System, can control the detector. The detector must be connected to the Chromeleon PC or an Ethernet LAN via the USB or LAN port on the instrument's rear panel.

To control the detector by Chromeleon, one of the following Chromeleon licenses is required:

- For Chromeleon  $\leq 6.40$ :  
Basic license: to record the pure signal without spectra  
*or*  
Basic license + Device Control license: to execute time-dependent commands. This license authorizes control of an entire chromatography system.  
*or*  
Basic license + Device Control license + PDA license: to record a three-dimensional data field (spectra acquisition).  
This license is available only for the UVD 340U.
- For Chromeleon  $\geq 6.50$ :  
Timebase Class 1 *or*  
Timebase Class 1 + PDA license: to record a three-dimensional data field (spectra acquisition).  
This license is available only for the UVD 340U.

For questions regarding the individual options, please contact your Dionex sales representative.

We generally recommend connecting the detector to the Chromeleon server PC via USB (Universal Serial Bus). Almost all PCs provide at least one USB port. However, if this is not possible, use a network connection (LAN) for communication between the detector and the Chromeleon server. For example, Windows NT 4.0 does not support USB. If you are using a LAN connection, please observe the recommendations for network operation (→ page 26).

For information about how to install the detector via USB and LAN, refer to USB Installation (see below) and LAN Installation (→ page 18).

#### 5.1.1 USB Installation

** Please note: Install the Chromeleon software (→ page 27) before connecting the detector to the USB port of the Chromeleon server PC.**

Connect the detector to the mains using the power cord shipped with the instrument. Please observe the information about the facility requirements and the electrical connection (→ page 8). Use the USB cable from the standard accessories kit (page 49) to connect the detector to the USB port on the Chromeleon server PC.

 **Please note:** The USB connection to the PC or the USB hub must not exceed 5m. Longer connections are possible via a special USB extension cable (Dionex part no. 8911.0004). Up to five extension cables may be connected in series. For system reasons, the overall connection length must not exceed 30m.

For Chromeleon versions 6.11, 6.20 and 6.30, the USB installation of the detector is via the Master Setup from the current Service Pack CD (part no. 4580.0316). Insert the CD into the CD drive of your Chromeleon server PC. Double-click Setup.exe in the root directory. Click **Next** to have the Master Setup check which Chromeleon version is installed on your PC. Follow the on-screen instructions as they appear to install the driver. If a version is found for which no driver is available, the setup aborts.

Starting with Chromeleon 6.40, the USB installation of the detector is handled automatically during the Chromeleon setup. The user is not required to take any other steps.

### 5.1.2 LAN Installation

 **Please note:** Use the LAN connection under Windows NT 4.0 only. For any other operating systems, a USB connection is recommended.

Connect the detector to the mains using the power cord shipped with the instrument. Please observe the information about the facility requirements and the electrical connection (→ page 8). Use the LAN cable from the standard accessories kit (page 49) to connect the detector to the LAN port on the Chromeleon server PC.

To ensure reliable communication between the detector and the Chromeleon server with a LAN connection, we recommend using a LAN connection that is independent of the office LAN, i.e., an instrument LAN, between the detector and the Chromeleon server PC. This type of connection requires that you install a **separate** 10 Mbit network interface card in the Chromeleon server PC and assign **unique** IP addresses to all connected devices. For information about how to install the separate network interface card in the Chromeleon server PC, see page 19.

If your PC already contains a separate network interface card for operating Summit HPLC devices, the detector can be connected to this card. For information about how to connect the detector using an instrument LAN under Windows NT4, see below.

 **Important:** Dionex cannot guarantee reliable communication when operating the detector on an office LAN because the load of the office LAN is a decisive factor. Overload of the office LAN may result in timeouts and loss of data, and thus disturb automatic operation of Chromeleon. Therefore, we advise against operating the detector on an office LAN.

## Connecting the Detector via an instrument LAN under Windows NT4

If the Chromeleon server PC is running Windows NT 4.0, the detector must be connected to the server PC via a LAN. NT 4 does not support USB.

If you wish to connect no other instrument but a single detector, you can connect the server PC and the detector via a so-called **crossover** cable; a special network cable with crossed-over data lines. These lines are usually marked by colors (red, yellow) to distinguish the cable from standard network cables.

Thus, the structure of the instrument LAN is as follows (peer-to-peer connection):

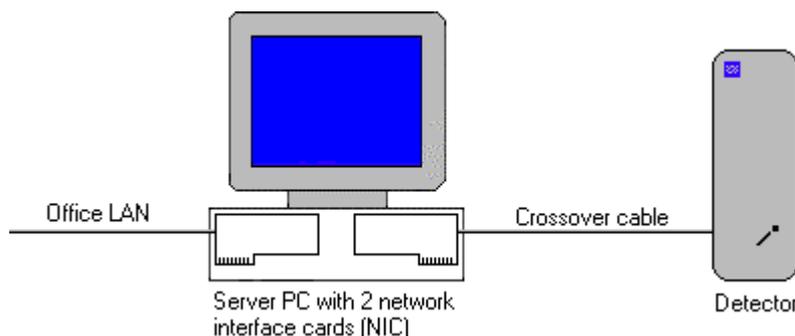


Fig. 10: Peer-to-peer connection

If you wish to connect several TCP/IP-enabled Summit HPLC devices to the server PC, you must use a hub (10 Mbit) to establish the connection to the instrument LAN. In this case, use standard network cables instead of the crossover cable (One standard network cable, part no. 8906.2038, is provided in the accessories kit.)

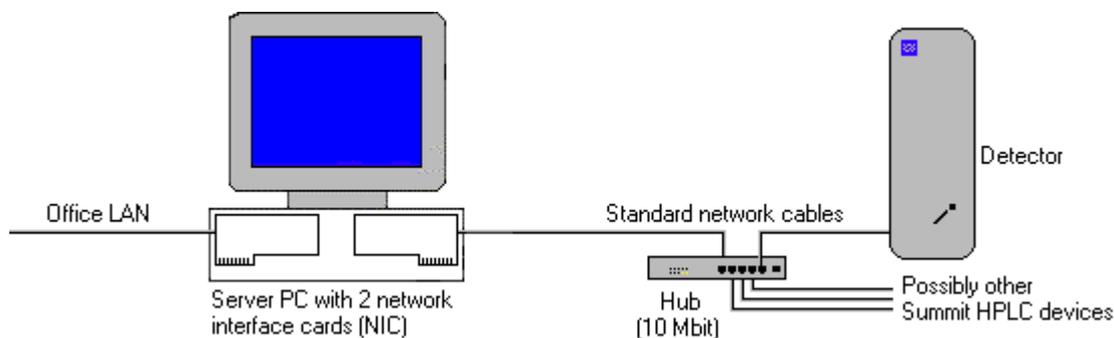


Fig. 11: Hub connection

## Separate Network Interface Card (NIC)

A network connection that is independent of the office LAN is called an instrument LAN. This kind of connection between the detector and the Chromeleon server requires the installation of a separate 10 Mbit network interface card (NIC, in the operating system = adapter) in the Chromeleon server PC.

Install the card according to the manufacturer's instructions, via **Start → Settings → Control Panel → Network → Adapters → Add**.

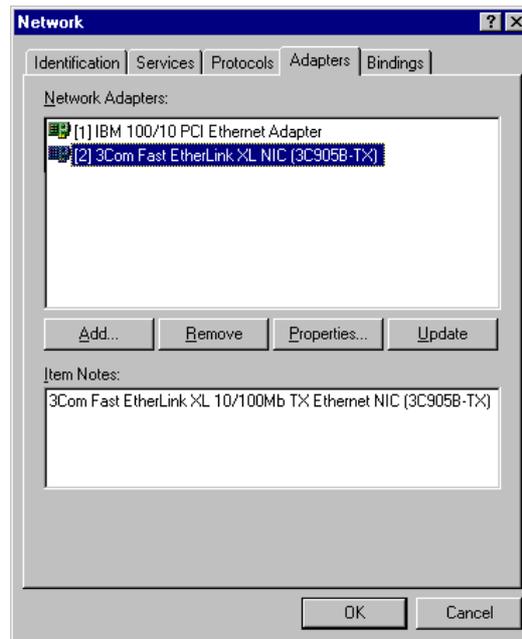


Fig. 12: Installing the separate network interface card

Configure the network adapter for the instrument LAN (here: [2] 3Com Fast EtherLink XL NIC (3C905B-TX)) on the **Bindings** tab page. First, select **all protocols** in the **Show Bindings for** field to verify that the TCP/IP protocol is installed. Install the TCP/IP protocol, if necessary:

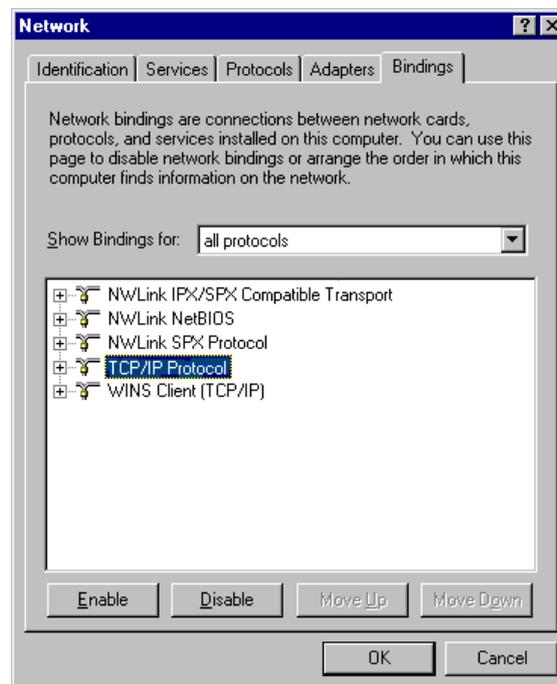


Fig. 13: Show bindings for all protocols

Then, select **all adapters** in the **Show Bindings for** field and disable all protocols for the adapter for the instrument LAN except the TCP/IP protocol:

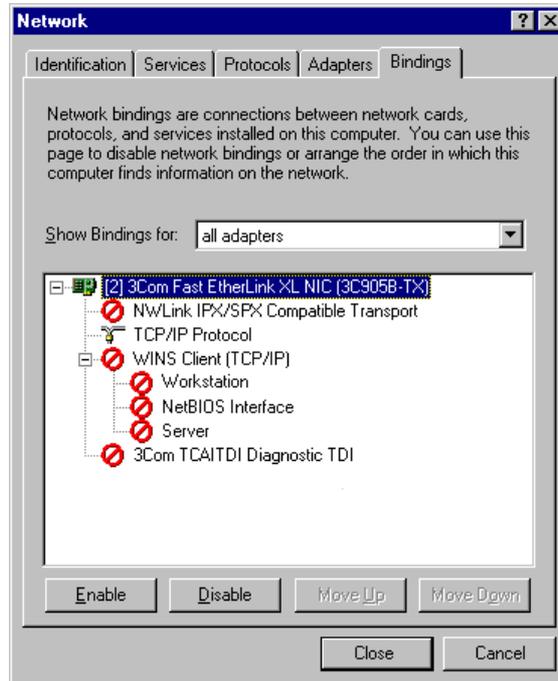


Fig. 14: Show bindings for all adapters

An IP address and a subnet mask are required for the separate network adapter because the TCP/IP protocol is used for the instrument LAN. The dialog box for entering the IP address and the subnet mask opens automatically during the installation.

**i** **Please note:** You may as well open this dialog box later again to change the IP address and the subnet mask if necessary. Select the properties of the TCP/IP protocol via **Start → Settings → Control Panel → Network → Protocols**. Then, select the TCP/IP protocol and open the **Properties of Microsoft TCP/IP** dialog box, using the **Properties** command on the context menu.

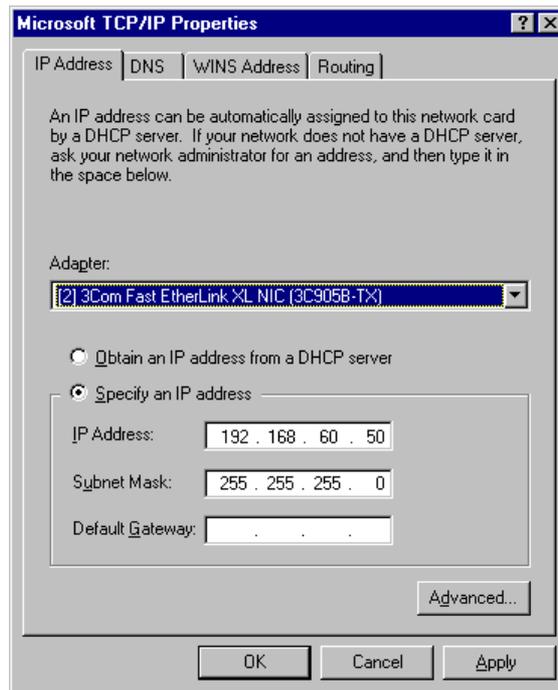


Fig. 15: Assigning the IP address and subnet mask

In the **Adapter** field, select the network adapter for the instrument LAN and enable the **Specify an IP address** option.

**⚠ Important:** Do not change the settings for the office LAN network interface card!

**⚠ Important:** For the adapter for the instrument LAN, disable all other network protocols and services (see above).

Assign a fixed IP address to the adapter for the instrument LAN.

First, identify which IP range is already used. To do so, open a DOS command box via **Start → Programs → Command Prompt** and enter: `Ipconfig /all`. Differentiate between the two following cases:

Case A: Already used IP address  $\neq$  192.168.60.xxx

Case B: Already used IP address = 192.168.60.xxx

**Note:** The subnet mask determines which part of the IP address describes the network and which part defines the individual devices connected to the network. Independent LANs have different network addresses. Based on the subnet mask 255.255.255.0 in the above example, the term "192.168.60" describes the network, while "xxx" defines the individual modules connected to the network.

**Case A:**

Select the address from the range given below and enter the subnet mask specified below:

IP Address: 192.168.60.xxx (xxx can be any number between 1 and 254)  
Subnet Mask: 255.255.255.0

Do not enter a gateway address; no gateway is available for the instrument LAN and the above addresses cannot be routed. Communication between the detector and the Chromeleon server is always direct

**Case B:**

If the range 192.168.60.xxx is already used, use a different network range for the instrument LAN, e.g., use 192.168.61.

**⚠ Important:** In this case, make sure that the addresses assigned to the individual Summit HPLC modules also start with 192.168.61.

For information about the appropriate value for your individual configuration, contact your system administrator.

Do not enter a gateway address; no gateway is available for the instrument LAN and the above addresses cannot be routed. Communication between the detector and the Chromeleon server is always direct.

**Applies to both, case A and case B**

It may happen that the detector that you want to control via the separate 10Mbit network adapter may already have an IP address and subnet mask assigned. In this case, when selecting the IP address of the network adapter of the server PC, be sure that only the last digit differs from the IP address of the detector. Otherwise, it may not be possible to address the connected Summit HPLC devices.

Example for a valid configuration for case A:

Detector:	IP address	192.168.60. <b>51</b>
	Subnet mask	255.255.255.0

Server:	IP address	192.168.60. <b>50</b>
	Subnet mask	255.255.255.0

Example for a valid configuration for case B:

Detector:	IP address	192.168.61. <b>51</b>
	Subnet mask	255.255.255.0

Server:	IP address	192.168.61. <b>50</b>
	Subnet mask	255.255.255.0

**⚠ Important:** Every device on the same network must have a unique IP address. Selecting duplicate IP addresses may cause conflicts on the network.

**⚠ Important:** Do not use 0 or 255 as the last numbers in IP addresses.

To check the selected settings, enter the following commands at the DOS level:

```
ipconfig /all
```

What it does: Lists the configuration of all network adapters. The newly installed 10Mbit network adapter has been configured successfully if this command also returns its IP address and subnet mask.

```
route print
```

What it does: Checks whether you can address the detector with the network adapter used for the instrument LAN. The new network adapter is correctly configured if the indicated network (here, for example, 192.168.60.0) is given under **Target** and its subnet mask is given under **Net mask**.

```
ping 192.168.60.51
```

What it does: Checks the connection to the detector with the IP address 192.168.60.51. If the installation is correct, the detector will reply to the ping command.

### 5.1.2.1 Assigning IP Properties to the Detector (CmIPUtil)

To operate the detector on a network, an IP address and a subnet mask must be assigned. The program used to assign these IP properties is the **CM IP Utility**.

It is only possible to assign IP properties when data are not being transferred between the detector and the Chromeleon server. To stop the Chromeleon server, select **Start → Programs → Chromeleon → Server Monitor**. In addition, the PC on which the CM IP Utility is running must be connected to the same subnet as the detector you wish to program.

- If necessary, copy the **CmIPUtil** program from the software CD to a separate directory on your computer.
- Double-click Setup.exe to start installation. Follow the installation instructions as they appear on the screen.
- Open the program via **Start → Programs → Chromeleon → IP Utility → CmIPUtil**.

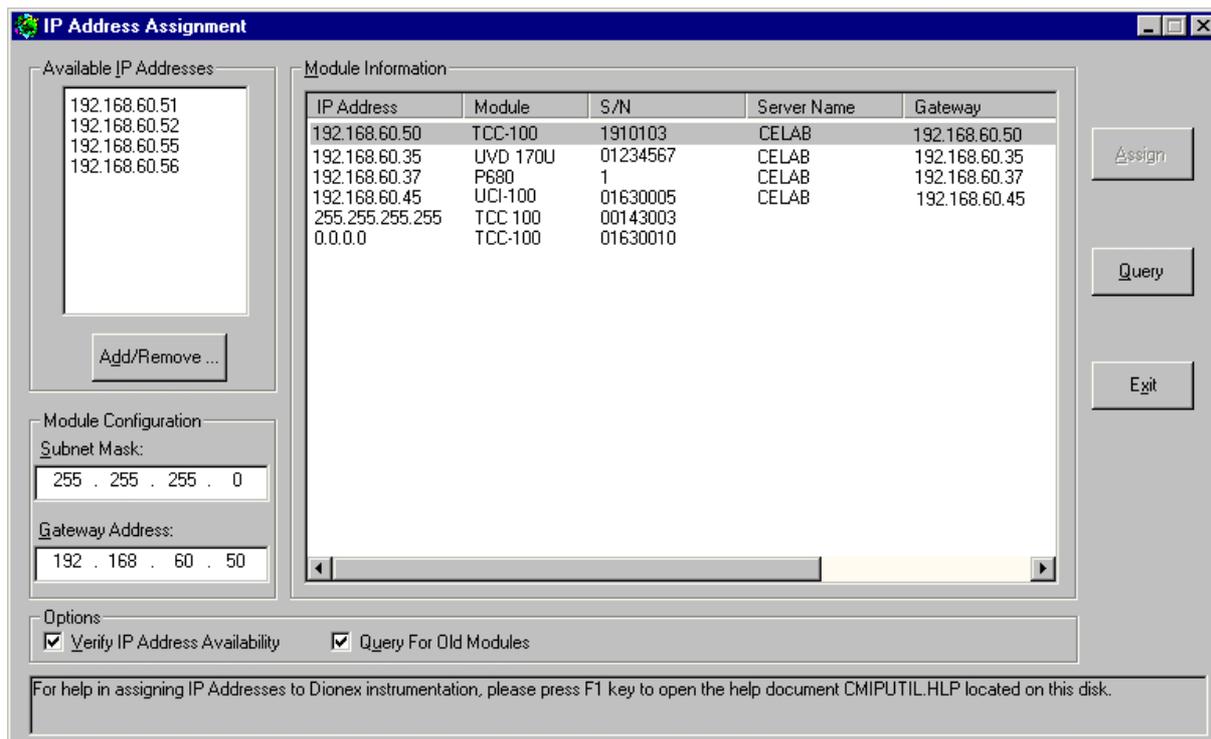


Fig. 16: Assigning IP properties (CmIPUtil)

The **Module Information** window of the **IP Address Assignment** dialog box lists all modules that are active on the network, together with their IP address, serial number (S/N), server name (the name or IP address of that server is given with which data are currently exchanged), gateway address, subnet mask, and Ethernet address. The IP address for modules that have not yet been configured is 0.0.0.0 or 255.255.255.255 (→ figure above).

- Enter the IP address and the subnet mask for the modules to be configured. The values depend on the settings for the adapter for the instrument LAN (→ page 23).
- Select the module to be configured by its serial number.
- In the **Available IP Addresses** window, select the IP address to be assigned to the detector. If it is not listed, click **Add/Remove** to enter the desired address.
- Enter the required subnet mask. Select the same subnet mask as used for the Chromeleon server PC.

When selecting the IP address of the network adapter of the server PC, be sure that only the last digit differs from the IP address of the detector. Otherwise, it may not be possible to address the connected Summit HPLC devices.

Example for a valid configuration:

Detector:	IP address	192.168.60.51
	Subnet mask	255.255.255.0
Server:	IP address	192.168.60.50
	Subnet mask	255.255.255.0

To configure several TCP/IP-enabled Summit HPLC devices, make sure that every device has its own IP address. In this example, the following entries would be possible:

2. TCP/IP-enabled device: IP address 192.168.60.52  
Subnet mask 255.255.255.0

3. TCP/IP-enabled device: IP address 192.168.60.53  
Subnet mask 255.255.255.0

 **Important:** Every device on the same network must have a unique IP address. Selecting duplicate IP addresses may cause conflicts on the network.

 **Important:** Do not use 0 or 255 as the last numbers in IP addresses.

- The **Gateway Address** field must not be empty, although no gateway is available for the instrument LAN. Therefore, enter the IP address of the device to be configured in this field to prevent a gateway from being used.
- When you finish entering IP properties, assign them to the module by clicking **Assign**. After about 1 second, the instrument's new parameters will be displayed in the Module Information window
- Click the **Query** button to check the settings.
- Click **Exit** to close the program.

 **Important:** Verify that a unique IP address has been assigned to all Summit HPLC devices that are connected to the Chromeleon server PC.

For more information, please refer to the CmIPUtil online Help.

### 5.1.2.2 Recommendations for Network Operation

Unlike USB connections, Ethernet LAN connections have limited real-time capabilities. Data transmission can occur only when no other connected user is using the network. In order to take full advantage of the real-time capabilities of the detector, select the instrument LAN connection (→ page 19). This ensures that other network users do not delay the server communication.

If the detector is connected to the data system via a LAN, it is not advisable to use the digital inputs of the detector for remote inject synchronization. This is because the timing of LAN communication varies, depending on the current LAN traffic.

If the detector is connected to the data system via USB, all remote inputs are polled after 0.1 seconds and they can be used without restrictions.

 **Please note:** Dionex cannot guarantee reliable communication when operating the detector on an office LAN because the load of the office LAN will be a decisive factor. Overload of the office LAN may result in timeouts and loss of data, and thus disturb automatic operation of the data system. We therefore advise against operating the detector on an office LAN.

## 5.2 Installing the Detector in Chromeleon

Proceed as follows to install the detector in the Chromeleon installation program (= server configuration):

- Start the Server Monitor program by selecting **Server Monitor** from the **Start → Programs → Chromeleon** menu on the taskbar. Start the server and close the Server Monitor window. The Server Monitor icon appears on the task bar.

**i** **Please note:** Clicking the **Quit Monitor** button quits (exits) the Server Monitor program, but it does not stop the server. To stop the server, click the **Stop** button.

- Start the **Server Configuration** program by selecting Server Configuration from the **Start → Programs → Chromeleon** menu on the taskbar.
- If necessary, click the "+" character beside the server name to display the items under the server.
- Select the timebase to which to add the detector.
- Select **Add Device...** on the **Edit** or context menu. The **Add device to timebase** dialog box is opened.
- Select Dionex from the left list box, and then select UVD 170U UV-VIS Detector or UVD340U PDA detector from the right list box. (For Chromeleon < 6.50: Select either **Dionex UVD 170U UV-VIS Detector** or **Dionex UVD 340U PDA** from the driver list.) Click **OK** to confirm your selection.

The tabbed pages show the current configuration of your detector.

### General Tab

Define the general instrument and hardware parameters:

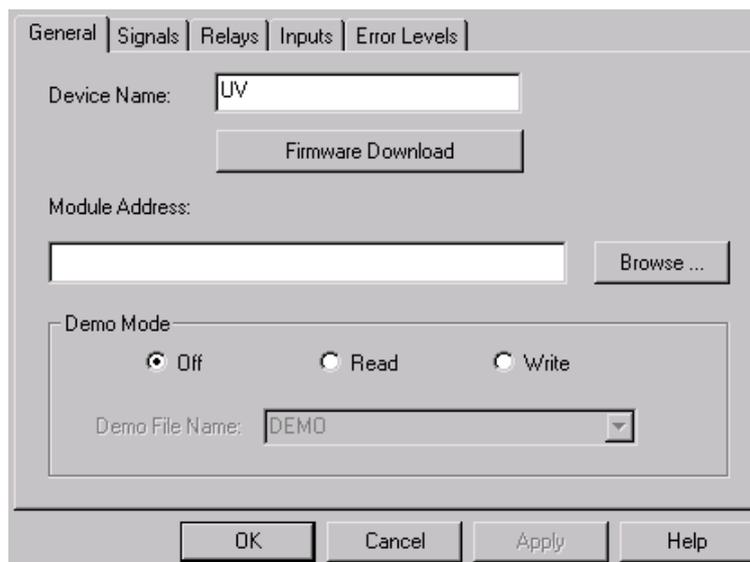


Fig. 17: General tab page

- The **Device Name** field indicates the instrument name under which the detector is listed in the installation environment (default: UV).

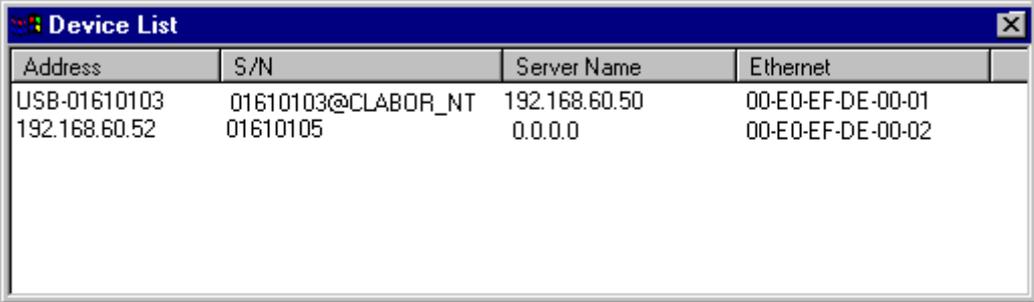
**i** **Please note:** Do not change the default device name (UV). If the default is changed, the links to the corresponding control panels may be lost.

- Click the **Firmware Download** button to download the current firmware version of the UVD driver from the data system to the detector. The current firmware version as well as the version of the file that is available in the \Bin directory of your Chromeleon installation (UVD.HEX) is displayed.

Click **OK** to start the firmware download. Please note that the Chromeleon server needs to be in idle mode for the download. The download takes several seconds.

**⚠ Important:** While the download is running, make sure that the communication between Chromeleon and the detector is not interrupted and do not turn off the detector. Otherwise, the entire firmware may be lost. If the download is not successful, contact Dionex Service.

- Click the **Browse...** button to select the **Module Address** of the desired detector. This opens a window that shows information about all available installed detectors (USB and LAN connections). For example, if the driver for the UVD 170U detector is installed, all installed UVD 170U detectors are displayed in the list.



Address	S/N	Server Name	Ethernet
USB-01610103	01610103@CLABOR_NT	192.168.60.50	00-E0-EF-DE-00-01
192.168.60.52	01610105	0.0.0.0	00-E0-EF-DE-00-02

Fig. 18: Device list

The **Address** column lists all available modules. The entry that is available via Ethernet (TCP/IP) includes the module's IP address. The entry for a module that is available via USB (identified by the prefix "USB") includes the module's Ethernet address or serial number.

If a module listed here is already connected to a Chromeleon server, the server name appears in the **Server Name** column. If a module is available for connection, the column shows 0.0.0.0 or is empty.

The **S/N** column lists the module's serial number and the name of the computer to which the module is connected while the Chromeleon server is running. The **Ethernet** column shows the module's Ethernet address.

Select the desired detector by double-clicking. The module's address is automatically entered in the **Module Address** field on the **General** tab page.

- Verify that the **Demo Mode** is turned off. Select **Off** to disable the demo mode if necessary.  
 Select **Read** to read and display data from an existing demo file instead of real data. Click the **Demo File Name** button to select a specific demo file.  
 Select **Write** to save the data currently delivered by the detector as a demo file. Click the **Demo File Name** button to determine the directory and the file name.

**Signals Tab**

The **Signals** tab page indicates the names of all signals or channels that can be recorded via the detector. In addition, it shows the signal unit (**Unit**) and the amplifying factor (**Factor**) of each signal.

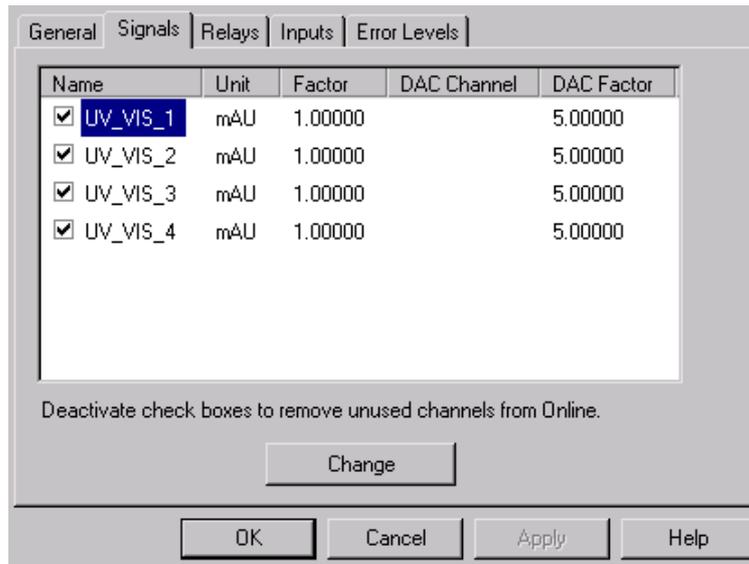


Fig. 19: Signals tab page

Select a check box to enable () or disable () the corresponding signal or (device) channel.

**i Please note:** Only activated signals will be available in Chromeleon. Raw data acquisition is possible for active signals and/or channels only.

The following channels are available: UV\_VIS\_1, UV\_VIS\_2, UV\_VIS\_3, and UV\_VIS\_4.

To change the signal settings, select the required signal, and click **Change**:

Signal parameter	Description
Signal Name	Signal name
Unit	Signal unit of the recorded raw data
Factor	Currently set amplifying factor
DAC Channel	DAC channel currently being used for conversion into an analog signal. This channel can be selected only if a 16-bit DAC board is installed correctly.
DAC Factor	Amplifying factor for the converted analog signal

### Relays Tab

The **Relays** tab page lists all relays that are available for the detector. Make sure the corresponding check box is selected (☑). If it is not, the channel will not be available in Chromeleon.

Option	Description
RELAY170_1	UVD 170U only
RELAY170_2	UVD 170U only
RELAY340_1	UVD 340U only
RELAY340_2	UVD 340U only

### Inputs Tab

The **Inputs** tab page lists the digital inputs that are available for the detector. Make sure the corresponding check box is selected (☑). If it is not, the channel will not be available in Chromeleon.

Option	Description
INPUT170_1	UVD 170U only
INPUT170_2	UVD 170U only
INPUT340_1	UVD 340U only
INPUT340_2	UVD 340U only

### Error Levels Tab

The **Error Levels** tab page classifies the severity of any errors that occur. It is generally not necessary to change the default settings.

Finally, save and close the modified Server Configuration.

 **Important:** Before turning off the detector, always "**disconnect**" the unit in Chromeleon.

For more information about how to configure the detector, refer to the Chromeleon online Help.

### 5.3 Operation with Chromeleon

Chromeleon can control the detector in two ways:

- Directly, via the icon and menu commands or via the controls in the UVD170U or UVD340U control panel
- Via time-based programs (PGM-file or programmable buttons)

The following commands and properties are available in the Expert mode; some of them are displayed only if the corresponding check boxes have been selected in the Server Configuration program (for information about how to set the Expert mode, refer to the Chromeleon online Help):

Command/Property	Description
AcqOff	Terminates data acquisition.
AcqOn	Starts data acquisition.
Autozero	Automatic null balance (= the current detector signal is interpreted as 0).
Average	Averages all measured values over the Step interval. Default: ON. OFF records only the last data point of each interval.
Bandwidth	Sets the bandwidth of a UV-VIS channel (Range 1 to 395 nm) (Also, see Wavelength).
BunchWidth	For UVD 340U only: Averages photodiode signals for 3D field acquisition (range 1.9 to 197.6 nm). Higher values for the bunch width enhance the signal-to-noise ratio, but reduce the spectral resolution. (Also, see MinWavelength, MaxWavelength)
CheckWavelength	Performs a wavelength check, using a holmium oxide filter (→ page 33).
Connect	Connects the detector to the data system. (Also, see Connected, Disconnect)
Connected	Indicates whether the detector is connected to the data system, i.e., under computer control. (Also, see Connect, Disconnect)
Delta	Indicates the signal's slope, i.e., the difference between the current value and the value one second ago; this is useful for triggers.
DemoFileName	Name of the demo file (e.g., Demo.340).
Disconnect	Disconnects the detector from the data system. (Also, see Connected, Connect)
FirmwareVersion	Indicates the current firmware version (read-only).
HardwareVersion	Indicates the hardware version of the detector (read-only).
Input 170_1 / Input 170_2 Input 340_1 / Input 340_2	Indicates the state of the digital input (On or Off).
Lamp	Indicates the lamp's state. The Lamp On (Off) command turns the lamp on or off.
Lamp Age	Indicates the lamp age (in hours).
LampIgnition	Indicates the number of lamp ignitions.
LampIntensity	Indicates the lamp intensity at 254 nm in counts/second (Range: 1 to 2000000 counts/second). The value can be used as a reference value to establish any decrease in the lamp intensity, if the lamp intensity was also measured when the lamp was new.
MaxAutoStep	Maximum step rate for Auto-Step Mode (UV-VIS channel) (Range: 0.1 to 5.1 sec, default: 5.1 sec).
MaxWavelength	For UVD 340U only: Maximum wavelength of the 3D field (Range: 210.0 to 595.2 nm). (Also, see MinWavelength, BunchWidth).
MinLampIntensity	At every AcqOn, the current lamp intensity is compared to the MinLampIntensity. If the current lamp intensity is below the value entered here, a warning is written to the Chromeleon audit trail.

Command/Property	Description
MinWavelength	For UVD 340U only: Minimum wavelength of the 3D field (Range 200.0 to 585.2 nm). (Also, see MaxWavelength, BunchWidth)
ModelNo	Indicates the detector type (e.g., UVD 340U; read-only).
RefBandwidth	Sets the reference bandwidth (3D field: range: 1.9 to 600.9 nm; UV_VIS: range 1 to 400 nm). (Also, see RefWavelength, Bandwidth)
RefWavelength	Sets the reference wavelength (3D field: range: 200.0 to 600.9 nm; UV_VIS: range 200 to 600 nm). The absorbency measured at this wavelength serves as a reference when correcting the baseline (of a 3D field or a channel).
Relay170_1 / Relay170_2 Relay340_1 / Relay340_2	The following commands are available: <b>State</b> (indicates or sets the state of the relay), <b>Duration</b> (when set, the relay's state toggles after the specified time), <b>On</b> (turns the relay on), and <b>Off</b> (turns the relay off).
Retention	Indicates the signal's retention time (in minutes).
SerialNo	Indicates the serial number of the detector.
Signal	Indicates the current signal value (UV-VIS channel). Available are: Value (current signal value), UpperLimit, and LowerLimit. If the current signal value is outside these limits, a warning is written in the Audit Trail.
SnapshotClearBLSpectrum	For UVD 340U only: Clears the buffer for baseline spectrum that was recorded using the <b>SnapshotGetBLSpectrum</b> command.
SnapshotDirPath	For UVD 340U only: Defines the destination directory for a UV spectrum that is recorded using the <b>SnapshotGetSpectrum</b> command.
SnapshotGetBLSpectrum	For UVD 340U only: Saves the current spectrum as baseline spectrum. The baseline spectrum is always subtracted from the spectrum recorded with the <b>SnapshotGetSpectrum</b> command.
SnapshotGetSpectrum	For UVD 340U only: Stores the current spectrum in a text file.
SnapshotResolution	For UVD 340U only: Defines the wavelength resolution for a UV spectrum that is recorded using the <b>SnapshotGetSpectrum</b> command (Range: 0.1 to 20.0 nm).
Step	Sets the step for data acquisition (UV_VIS: range: 0.01 to 4.80 sec., AUTO. AUTO selects the best step dynamically; 3D field: range: 0.1 to 4.0 sec).
Wavelength	Sets the wavelength of a UV-VIS channel at which the channel measures the signal (Range: 200 to 595 nm). (Also, see Bandwidth).

For information about individual commands and parameters and about the command syntax, refer to the corresponding **Chromeleon control panel**. Select **Command...** on the **Control** menu. The **Commands** dialog window is opened. You can also open this window by pressing the F8 key. In the left list box, click the "+" character beside **UV** to display the items underneath.

For more information (also on any parameter or command that might not be listed here), refer to the Chromeleon online Help and/or Chromeleon manual.

## 5.4 Wavelength Calibration under Chromeleon

The wavelength is calibrated automatically after each "Lamp on" or "Connect" command ("detector calibration"). The "CheckWavelength" command checks the currently valid wavelength calibration. The maximum deviation of this calibration compared to the instrument status is given in the Audit Trail.

- During calibration, the baseline must be sufficiently stable. This may not be the case, e.g., if the solvent composition has been modified or if there are bubbles in the solvent.
- The solvent in the cell must not be fully absorbing in the wavelength range to be calibrated. This will be the case, e.g., if the cell is filled with 96% hexane/4 % ethyl acetate.
- Before calibration, make sure that the deuterium lamp is already warm because its spectrum changes a lot during the first minutes after turning on the lamp.

If these conditions are not met, the process will be interrupted with the corresponding error message. When the problem is solved, repeat the calibration using the **Disconnect** command followed by the **Connect** command.

Calibrating the detector is via a holmium oxide filter that is installed in the beam path of the deuterium lamp. The maxima are determined from the resulting transmission spectrum and compared to the holmium oxide values stated in the literature. If a difference is detected for this maximum between the measured value and the known value, interpolation is performed between this maximum and the two adjacent maxima to correct the wavelength allocation of the affected photodiodes. Wavelength calibration can take up to 2 minutes. During this time, data acquisition is not possible.

## 5.5 System Wellness and Reliability

To help you detect small problems before they become big ones, Chromeleon supports different System Wellness and reliability commands and properties, such as LampAge, LampIgnitions, and MinLampIntensity. Also, see the corresponding commands in Operation with Chromeleon (→ page 31).

If an error is found, an error message is displayed and the error is logged in the Chromeleon audit trail.

For more information, please refer to the Chromeleon online Help.



## 6 Troubleshooting

### 6.1 The Most Frequently Problems

The following table provides a summary of the most commonly observed operating problems, lists possible causes, and suggests remedial actions:

Problem	Probable Cause	Remedial Action
No function	<p>The detector is not connected to the mains.</p> <p>The detector is not turned on.</p> <p>The fuses blow.</p> <p>Replacement fuses blow immediately.</p> <p>The USB or LAN cable between the detector and PC is not correctly installed.</p>	<p>Connect the power cord to its source.</p> <p>Turn on the detector.</p> <p>Replace the fuses (→ section 3.2.2, page 10).</p> <p>Check the voltage selector setting; reset the selector, if necessary (→ page 8).</p> <p>Call Dionex Service.</p> <p>Check the USB or LAN connection to the PC.</p>
The lamp is not turned on.	<p>The lamp is still too hot (message in Chromeleon: "Lamp too hot...").</p> <p>The lamp cannot be turned on (message in Chromeleon: "Lamp On failed...").</p> <p>The USB or LAN cable between the detector and PC is not correctly installed.</p>	<p>Wait 5 minutes, and then turn on the lamp again.</p> <p>Wait 5 minutes, and then turn on the lamp again. If several attempts fail, check the lamp and the connection cable.</p> <p>Check the USB or LAN connection to the PC.</p>
There is no signal or an irregular signal.	<p>The flow cell is contaminated.</p> <p>Transmission through the mobile phase is low.</p> <p>The spectral range is incorrect.</p> <p>The injection valve is faulty.</p> <p>There is a fault in the diode array.</p> <p>The lamp intensity is too low.</p>	<p>Clean the flow cell (→ section 7.3.3, page 43).</p> <p>Select a different wavelength.</p> <p>Check the solvent for contaminants.</p> <p>Select a different spectral range.</p> <p>Check the fluidics.</p> <p>Call Dionex Service.</p> <p>Replace the lamp (→ section 7.2, page 41).</p>
Strong baseline drift	<p>The warm-up time is too short.</p> <p>The column is contaminated.</p> <p>The system is not equilibrated.</p> <p>The environment is unstable.</p> <p>The solvent is contaminated.</p> <p>The flow cell is contaminated.</p> <p>The lamp is defective.</p> <p>The solvent is used in a cycle</p>	<p>Allow min. 30 min. warm-up.</p> <p>Rinse or replace the column.</p> <p>Continue to rinse the system until it is equilibrated.</p> <p>Ensure constant temperature and humidity.</p> <p>Change the solvent.</p> <p>Clean the flow cell (→section 7.3.3, page 43).</p> <p>Replace the lamp (→ section 7.2, page 41).</p> <p>Direct the solvent to the waste.</p>

Problem	Probable Cause	Remedial Action
High noise level	<p>The solvent is contaminated. The lamp is old.</p> <p>There are gas bubbles in the system. The pump suffers from pressure pulsation. The wavelength is incorrect. The step is too small (e.g., 0.1 sec.).</p>	<p>Replace the solvent. Replace the lamp (→ section 7.2, page 41). Prime the system. Check and prime the pump.</p> <p>Select a suitable wavelength. Increase the step (e.g., to 0.5 to 1 sec.).</p>
Peak broadening	<p>The capillaries are too long or their internal diameter is too large. The column is overloaded, contaminated, or old. The solvent is old.</p>	<p>Shorten or replace with narrower capillaries. Rinse or replace the column.</p> <p>Replace with fresh solvent.</p>
The aAnalysis is not reproducible.	<p>The sample is unstable. The gradient cannot be reproduced. The environment is unstable.</p> <p>The column is overloaded, contaminated, or old. There are air bubbles in the flow cell.</p>	<p>Use fresh sample or change conditions. Change the gradient program and/or check the pump. Ensure constant temperature and humidity. Rinse or replace the column.</p> <p>Prime the system.</p>

## 6.2 The Most Frequent Error Messages

If communication between the data system and the column compartment cannot be established, an error message is displayed in the Chromeleon Audit Trail. The following table lists the most important error messages, along with possible causes and the corresponding remedial actions.

**⚠ Important:** If the server configuration is changed in any way, messages referring to the previous configuration may continue to appear for up to 30 seconds after the change. These messages can be ignored. Thus, always note the device name (UVD 340U@...) referenced in the message.

**ℹ Please note:** The error messages below may also read either **UVD340U@ + serial number** (= UVD@USB-01610103) or **UVD340U@ + IP address** (= UVD340U@192.168.50.1), depending on the connection type (USB or LAN) specified for the column compartment in the Server Configuration. The messages for the UVD 170U detector are identical to these except for the detector name.

Problem	Probable Cause	Remedial Action
Error opening UVD 340U - Connection refused.	<p>Another Chromeleon server already uses the indicated detector.</p> <p>The existing connection is not yet cleared completely.</p> <p>The subnet mask and gateway address of the detector are configured incorrectly.</p> <p>A gateway may maintain an unintended connection to the detector as soon as the Chromeleon server is stopped in an uncontrolled way (power-failure, system hung-up).</p>	<p>Check that the correct detector was selected or terminate the detector's communication with the other Chromeleon server.</p> <p>Wait for 30 seconds and repeat the procedure.</p> <p>Via CmIPUtil, make sure that the correct parameters are specified (→ sec. 5.1.2.1, page 24).</p> <p>Restart the detector.</p>
Error opening UVD 340U - Connection timed out.	<p>The Chromeleon server failed to connect to the indicated detector.</p> <p>The network connection is interrupted during firmware download.</p> <p>The detector power supply is interrupted during firmware download.</p>	<p>Check that the detector is turned on and that the network connection is working.</p> <p>Note the name of the indicated detector. It is possible that the Chromeleon server is trying to connect to a detector that is no longer part of the server configuration. Check and change the Module Address, if necessary. Then, retry.</p> <p>Check the network connection.</p> <p>Check the electrical connection of the detector.</p>
UVD 340U - Connection reset by peer.	<p>The power supply to the detector is interrupted for a short period.</p>	<p>Check the electrical connection of the detector.</p>

Problem	Probable Cause	Remedial Action
UVD 340U - Host not found.	Network problems: no connection to the detector.	Check the network settings for the detector and network card. The network connection between the Chromeleon server and the detector might be inappropriate (→ sec. 5.1.2.2, page 26) (contact your network administrator).
UVD 340U - Permission denied.		
UVD 340U - Network is unreachable.		
UVD 340U - No route to host.		
UVD 340U @ USB-00-E0-EF-DE-XX-XX - Device not found on the USB.	The USB connection between the detector and the Chromeleon server is interrupted. The power supply to the detector is interrupted.	Check the USB connection. Check the electrical connection of the detector.
Error opening UVD 340U @ USB-00-E0-EF-DE-XX-XX – The System cannot find the file specified	The USB connection between the detector and the Chromeleon server is interrupted. The power supply to the detector is interrupted.	Check the USB connection. Check the electrical connection of the detector.
Error issuing control request to UVD 340U	The Chromeleon server cannot connect to the specified detector.	Check the USB and LAN connection respectively. Check the electrical connection of the detector. Remove the detector specified in the message from the server configuration or else select a different detector from the list of available detectors in the Server Configuration program (via Properties/Browse).
Error reading from UVD 340U @ USB-00-E0-EF-DE-XX-XX Data error (cyclic redundancy check)	There is a transmission error between the detector and the Chromeleon server.	Check the USB connection. The connection length must not exceed 5 m to the next hub. The overall connection length including the hub connections must not exceed 30 m (→ page 18). Replace any defective USB cable or hubs.
Error reading from UVD 340U @ USB-00-E0-EF-DE-XX-XX	The connection between the detector and the Chromeleon server is interrupted. The power supply to the detector is interrupted.	Check the USB connection. Check the electrical connection of the detector.

### Chromeleon Error Messages

For a list of all Chromeleon error messages, see the Chromeleon installation program (Server Configuration). Double-click the detector in the left window section and select the **Error Levels** tab (→ page 30) in the dialog box. You can also open the dialog box by clicking the detector in the left pane and then selecting the unit's **Properties** on either the **Edit** menu or the context menu.

## 7 Maintenance

### 7.1 General Information

The detectors are made of high-quality components and materials, which keep maintenance requirements to a minimum. In general, the unit should be kept clean. The painted surfaces are relatively resistant to weak acids and alkaline or organic solutions. Nevertheless, immediately wipe up all liquids spilled onto the detector's painted surface, using a lint-free cloth or paper.

The following sections describe all maintenance procedures that can be carried out by the user. Only qualified Dionex personnel should perform any additional servicing.

 **Important:** Always use the original packaging when shipping the detector. Shipping the instrument in anything other than the original packaging will void the product warranty! (→ Warranty, page 2).

All parts serviceable by the user (e.g., the lamp and flow cell) are accessible via the removable cover on the detector's left-side panel. To open, press in and turn the knurled screw 90° counterclockwise. You may now open and remove the panel. The lamp and flow cell are clearly visible (→ Fig. 20).

 **Warning:** During operation, the lamp becomes extremely hot and remains so for some time after the unit is turned off. To avoid possible injury, allow sufficient time for the lamp to cool before performing any maintenance.

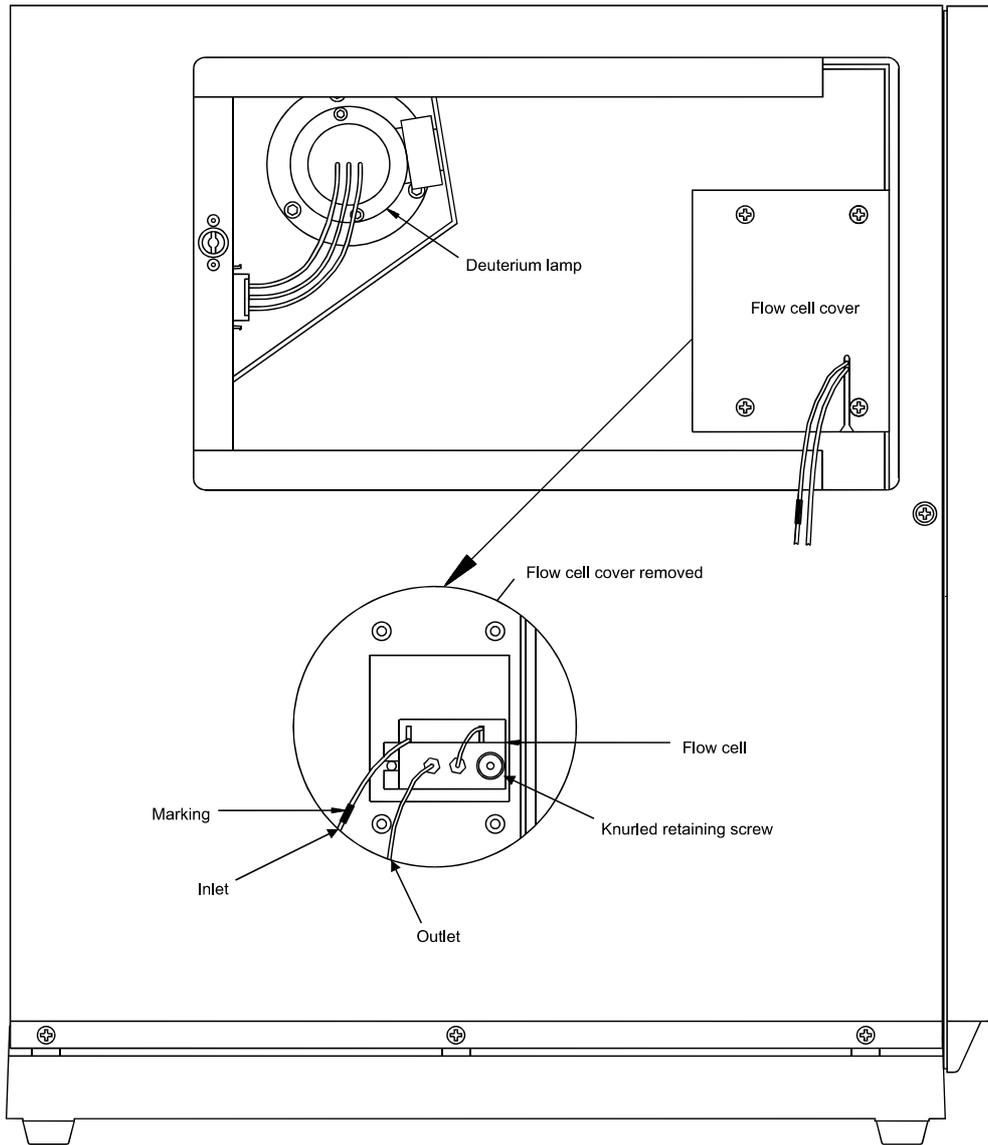


Fig. 20: Side View (side panel open)

## 7.2 Deuterium Lamp

### 7.2.1 Removing the Lamp



**Warning:** During operation, the lamp becomes extremely hot and remains so for some time after the unit is turned off. To avoid possible injury, allow sufficient time for the lamp to cool before performing any maintenance.

- If the detector is connected to Chromeleon, select the **Disconnect** command in Chromeleon to terminate communication.
- Turn off the power to the detector and disconnect the unit from the mains.
- Remove the removable cover from detector's left-side panel. To open, press in and turn the knurled screw 90° counterclockwise. You may now open and remove the panel. Do not bend the Teflon capillary.
- Wait until the lamp has cooled down!
- Disconnect the lamp by gently pressing either side of the locking plug.
- Undo and remove the two lamp retaining screws (using a 2.5 mm Allen-key) and carefully remove the lamp.

### 7.2.2 Installing the Lamp

- Insert the new lamp (part no. 5053.1204), aligning the notch on its base with the alignment pin of the lamp housing and replace the retaining screws. **No** additional alignment is required.



**Important:** Avoid touching the glass tube of the lamp.

- Reconnect the cable.
- Reinstall the removable cover on detector's left-side panel.
- You may now turn on the detector and restore communication with Chromeleon, using the **Connect** command.



**Please note:** A new lamp must "run in" for at least 24 hours before the first analysis. During this period, strong baseline fluctuations and increased noise may occur.

### 7.3 Flow Cell

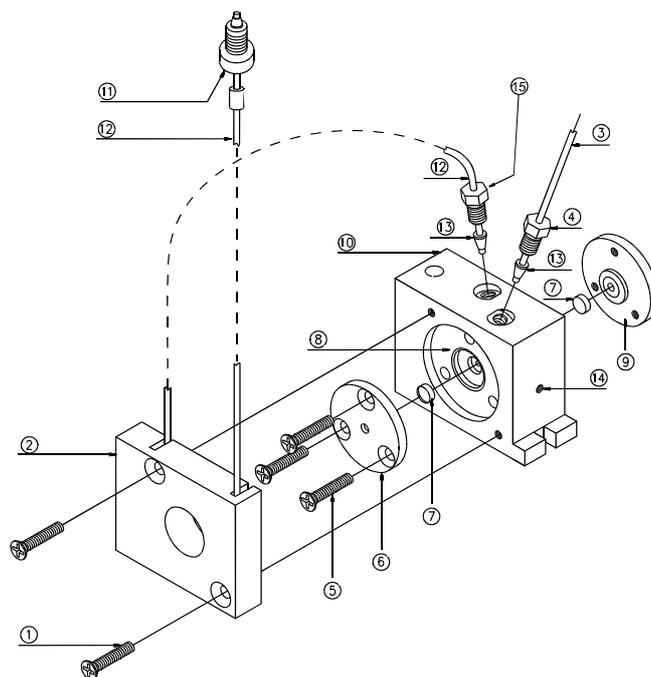


Fig. 21: Standard flow cell

No.	Description	Part no.
1	M3x12 screw (DIN965)	Included in 5065.1815
2	Heat exchanger	Included in 5065.1815
3	PEEK tubing (0.5 mm ID)	2251.6002
4	PEEK fitting screw (1/16", 15 mm)	Included in 5065.1815
5	M3x23 screw (DIN 965)	Included in 6065.1815
6	Lens retaining plate 1	Included in 6065.1800
7	Quartz lens	1343.0511
8	Flow cell body	-----
9	Lens retaining plate 2	Included in 6065.1800
10	Flow cell housing	-----
11	Single-part hand-tight fitting	Included in 5065.1815
12	Capillary tube (1.58 x 0.25 ID)	Included in 5065.1815
13	PEEK double ferrule	-----
14	Flow cell body retaining screw	-----
15	Fitting screw	-----

Part no.	Description
5065.1815	Heat exchanger for analytical flow cell, including: Heat exchanger PEEK fitting screw (1/16", 15 mm) Capillary tube (1.58 x 0.25 ID) Single-part hand-tight fitting M3x12 screw (DIN 965) (2 off).
6065.1800	Analytical flow cell repair kit, including: M3x23 screw (DIN 965) (3 off), Quartz lens (2 off.) Lens retaining plate 1 (1 off) Lens retaining plate 2 (1 off)

### 7.3.1 Removing the Flow Cell



**Warning:** During operation, the lamp becomes extremely hot and remains so for some time after the unit is turned off. To avoid possible injury, allow sufficient time for the lamp to cool before performing maintenance.

- If the detector is connected to Chromeleon, first terminate communication by selecting the **Disconnect** command in Chromeleon.
- Turn off the detector. Disconnect the power cord.
- Remove the removable cover from detector's left-side panel. To open, press in and turn the knurled screw 90° counterclockwise. You may now open and remove the panel. Do not bend the Teflon capillary.
- Undo the four retaining screws and remove the flow cell cover.
- Undo the knurled flow cell retaining screw and carefully remove the flow cell assembly.

### 7.3.2 Installing the Flow Cell



**Important:** Do **not** use the **UVD 160S/320S** flow cells in the **detector**.

- Insert the new or cleaned flow cell, aligning the notch with the alignment pin of the flow cell socket. **No** further alignment is necessary.
- Reinstall the flow cell cover.
- Reinstall the removable cover on detector's left-side panel.
- You may now turn on the detector and restore communication with Chromeleon, using the **Connect** command.

### 7.3.3 Cleaning the Flow Cell



**Important:** Unlike the other flow cells, it is not possible to disassemble the fused silica nano flow cell for cleaning. Clean the nano flow cell by flushing with 0.2M nitric acid, followed by water and methanol.



**Important:** When cleaning the flow cell, note that only the lens retaining plates and the lenses may be removed. Do not attempt to remove the flow cell body from its housing! Clean the flow cell body together with the housing.

To clean the flow cell (except the nano flow cell), follow the steps below. The numbers in parentheses refer to the corresponding parts in Fig. 21:

- Undo and remove the screws (1) and remove the heat exchanger (2).
- Undo and remove the screws (5) and carefully remove the lens retaining plates (6 and 9) and lenses (7).
- To avoid scratching the lenses, place them on a clean, lint-free cloth or tissue.

- Clean the lenses, using a soft, lint-free cloth or tissue and an optical cleaning solution or isopropanol.
- Replace scratched or damaged lenses.

**⚠ Important:** Do not attempt to remove the flow cell body (8) from the housing (10)!

- To clean the flow cell body and housing, rinse the parts with water, isopropanol, or methanol, or place the entire assembly in an ultrasonic bath.

**⚠ Important:** Never attempt to remove dirt from the flow cell body using a spatula, tweezers, or other object, as this may cause irreparable damage.

- Reinstall the lenses onto either side of the flow cell body so that the plane faces are on the inside.
- Reinstall the lens retaining plates (6 and 9), taking care to tighten the screws (5) evenly and without excessive force.

**⚠ Important:** If you have loosened the fitting screws (4 and/or 15) on the flow cell body, take care not to re-tighten the screws too tight to prevent damage to the flow cell body.

- Check the flow cell for leakage **before** you install them into the unit. Tighten the screws (5) if necessary.

## 8 Upgrade Options

The table below lists all upgrade options available for the UVD 170 and 340 detectors. If you have any questions, please contact Dionex Sales or your Distributor.

<b>Part No.</b>	<b>Description</b>
5071.0050	Upgrade kit UVD 170U to UVD 340U
5071.0060	Upgrade kit UVD 170S to UVD 340U
5071.0070	Upgrade kit UVD 340S to UVD 340U
5072.0050	Upgrade kit UVD 170S to UVD 170U



## 9 Technical Specifications

<b>Performance</b>	
Wavelength range	Programmable 200 nm - 344 nm (UV range) 345 nm - 595 nm (VIS range)
Noise	$< \pm 5\mu\text{AU}$ (wavelength: 254 nm, bandwidth: 8 nm, dry flow cell)
Drift	$< 5 \times 10^{-4}\text{AU/h}$ , after 3h warm-up at a wavelength of 254 nm and with a dry flow cell
Wavelength accuracy	$\pm 0.75\text{ nm}$ (UV range) $\pm 1.5\text{ nm}$ (VIS range)
Spectral resolution	UVD 340U: 1.9 nm
Bandwidth	Programmable from 1.9 to 400 nm
Linearity	$\leq 1\%$ at 1.5 AU
Measuring range	0 to 2AU
Time constant	0.1 to 4.0 s, programmable
Power-up wavelength verification	Automatic via internal holmium-oxide filter
Wavelength calibration	Automatic or on demand
Minimum step	0.1 s
<b>Optical System</b>	
Principle	Single-beam principle with simultaneous measurement across the photodiode array.
Optical bench	Photodiode array bench without moving parts
Pixel resolution	1.9 nm (UV range) 3.3 nm (VIS range)
Light source	Deuterium lamp
<b>Electronics</b>	
Control	All functions controllable via LAN or USB Program-controlled by Chromeleon permanent status transfer via 2 LEDs on the front panel
PC connection	Via USB or Ethernet-LAN (RJ45, 10 MBit) connection
Additional USB ports	Integrated USB hub with three type A USB ports for connection of other Summit HPLC modules
I/O interfaces	Digital I/O: 2 inputs (digital input voltage: 0-5V), 2 relay outputs (default open), can also be used as TTL compatible inputs.

Signal output	UVD 170U: 4 detection channels UVD 340U: 4 detection channels plus 3D-field (with Chromeleon PDA license)
<b>Flow Cells</b>	
Standard analytical flow cell:	Volume: 10 µL Path length: 9 mm Max. Pressure limit: 100 MPa (1450 psi)
Biocompatible flow cell - optional -	Volume: 10 µL Path length: 9 mm Max. Pressure limit: 100 MPa (1450 psi)
Semi-preparative flow cell - optional -	Volume: 6 µL Path length: 2 mm Max. Pressure limit: 100 MPa (1450 psi)
Micro flow cell - optional -	Volume: 2.5 µL Path length: 9 mm Max. Pressure limit: 10 MPa (1450 psi)
Fused silica nano flow cell - optional -	Volume: 395 nL Path length: 8 mm Max. Pressure limit: 40 MPa (5800 psi)
<b>Physical Specification</b>	
Power requirements	115/230V ± 10%, 50/60Hz
Power consumption	50VA
Environmental conditions:	Range of use: Indoor use Temperature: 10°C to 35°C (50°F to 95°F) Air humidity: 40 to 85% relative humidity, non-condensing Overvoltage category: II Pollution degree: 2
Instrument panel	1 two-colored LED (red/green) indicating the instrument status (connection to Chromeleon/deuterium lamp)
Wetted parts	PEEK, quartz, stainless steel
Dimensions (w x h x d)	210 x 480 x 430 mm 8.3 x 18.9 x 16.9 in
Weight	20kg (44 lbs)

Technical information: May 2003.

All technical specifications are subject to change without notice.

## 10 Accessories and Spare Parts

Accessories and spare parts are always maintained at the latest technical standard. Therefore, part numbers are subject to change. However, updated parts are always compatible with the parts they replace.

### 10.1 Standard Accessories (included in the shipment)

The following standard accessories (part no. 5071.9000) are shipped with the detector. Accessory parts listed below without their part numbers are usually available in one of the UVD-U spare parts kits (→ section 10.2, page 50).

Part No.	Description	Qty*
	1A fuse, slow, 5x20 mm (available as spare part in the UVD Fuses kit, part no. 6065.9002)	2
	2A fuse, slow, 5x20 mm (available as spare part in the UVD Fuses kit, part no. 6065.9002)	2
1310.7031 or 1310.7032	Power cable (220V) or Power cable (125V) or (depending on the destination country)	1
2146.1051	Wrench 1/4" x 5/16"	1
2146.2625	Pin spanner 2,5	1
2261.0121	PEEK fitting screw 1/16", 15mm	2
2261.0122	PEEK double ferrule	2
2309.1100	Assortment box for accessories	1
6007.9100	Silicone tube (2.8 x 1.3), 3m	1
8906.2038	RJ45 cable for Ethernet connection, 3m	1
8911.0001	Mini-DIN signal cable, 6-pin, 5m	1
8911.0002	USB cable, 5m, Type A to Type B	1
4580.0316	Chromeleon 6 Service Pack CD	1
4820.7100 or 4820.7150	UVD 170/340U Operating Instructions, German or UVD 170/340U Operating Instructions, English (depending on the destination country)	1

\* The part number always refers to the packing unit. For further information, please contact your Dionex sales representative.

## 10.2 Optional Accessories and Spare Parts

Part no.*	Description
1343.0511	Quartz lens for standard flow cell
2101.0303	M3 knurled flow cell retaining screw
2200.5502	Single-part, hand-tight fitting
2250.1001	Capillary (1.58x0.25 ID)
2251.6002	PEEK capillary tube for standard flow cell (1/16", 0.50 mm)
2261.0121	PEEK fitting screw (1/16", 15 mm)
2261.0122	PEEK double ferrule for standard flow cell
3321.0000	10 Standards (Uracil/Pyrene in MeOH) (Required for the General Function Test during Installation Qualification)
5053.1204	Deuterium lamp
5065.1800	Semi-preparative flow cell (6 µL)
5065.1810	Standard analytical flow cell (10 µL)
5065.1810M	Micro flow cell (2.5 µL)
5065.1810N	Fused silica nano flow cell (395 nL)
5065.1815	Heat exchanger for analytical flow cell, including: Heat exchanger PEEK fitting screw (1/16", 15mm) Capillary tube (1.58x0.25 ID) Single-part, hand-tight fitting M3x12 screw DIN965 (2 pcs).
5065.1816	Heat exchanger for preparative flow cell, including: Heat exchanger PEEK fitting screw (1/16", 15mm) Capillary tube (1.58x0.70 ID) Single-part hand-tight fitting Screw M3x12 DIN965 (2 pcs).
5065.1820	Biocompatible flow cell (10 µL, PEEK capillaries)
6065.1800	Repair kit for analytical flow cells, including: M3x23 screw DIN 965 (3 pcs.), Quartz lens (2 pcs.) Lens retaining plate 1 (1 pc.) Lens retaining plate 2 (1 pc.)
6065.9001	UVD 340 / 170 Repair Kit Quartz lenses (2 pcs) PEEK capillary tubing (1/16", 0.50 mm, 2 m) PEEK fitting screws (1/16", 15 mm) (2 pcs) PEEK double ferrule (2 pcs) Deuterium lamp (2 pcs)

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Part no.*	Description
6065.9002	UVD Fuses kit, including: 0.80A fuse, medium-slow, 5x20mm (1 pc) 1A overload fuse, slow, 5x20mm, (2 pcs) 2A overload fuse, slow, 5x20mm (2 pcs)
8911.0004	USB extension with signal amplifier, 5m

\* The part number always refers to the packing unit. For further information, please contact your Dionex sales representative.



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