

## MULTICOM

Clarity Hardware

ENG

Code/Rev.: M110/90B Date: 2024-02-14

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To facilitate the orientation in the **MultiCOM** manual and **Clarity** chromatography station, different fonts are used throughout the manual. Meanings of these fonts are:

Open File (italics) describes the commands and names of fields in **Clarity**, parameters that can be entered into them or a window or dialog name.

WORK1 (capitals) indicates the name of the file and/or directory.

ACTIVE (capital italics) marks the state of the station or its part.

Chromatogram (blue underlined) marks clickable links referring to related chapters.

The bold text is sometimes also used for important parts of the text and the name of the **Clarity** station. Moreover, some sections are written in format other than normal text. These sections are formatted as follows:

Note:	Notifies the reader of relevant information.
Caution:	Warns the user of possibly dangerous or very important information.

#### Marks the problem statement or trouble question.

Description: Presents more detailed information on the problem, describes its causes, etc.

Solution: Marks the response to the question, presents a procedure how to remove it.

# 1 MultiCOM converter

This manual describes the use of the MultiCOM USB to RS232 converter.

**MultiCOM** is a device which connects to the PC via the USB port and provides 6 serial 9-pin ports to the computer. It is also equiped with a free USB port for the connection of the HW key.

**MultiCOM** converter has been developed for the handling of devices in the LC and GC systems controlled via the RS232 serial interface. When connected to a standard PC, the **MultiCOM** needs no power supply (it is powered from the **USB**), but can also be powered (if needed) from the external power supply adapter.



Fig. 1: MultiCOM - face

The side panel contains two **USB** connectors (one for the connection to the PC, the other for the **HW** key) and the power supply connector. The front panel contains six standard serial 9-pin (plug) ports, each with its own LED communication state indicator.

## 1.1 Side panel



Fig. 2: Side panel

### Green LED status:

- No light not connected to USB, the driver is not installed or is in suspend mode.
- Continual light idle state, no communication.
- **Blinking 10100000** (two short consecutive blinks) only sending data (from the **USB** to the COM port).
- **Blinking 01011111** (two short consecutive drop-outs in the continual shine) only receiving data (from the COM port to the **USB**).
- **Blinking 1:1** (2 Hz frequency) both sides are in communication, receiving and sending data.

## 1.2 Brief technical overview

- 6 RS-232 (non-isolated fully configurable serial ports DB9M).
- 1 USB port for the HW key (or another device with low power consumption).
- 1 USB port for connection to the PC.
- Powered from **USB** or external power supply.
- **USB** ports has USB-A connectors and are fully compliant with USB Spec Rev 1.1.

## 2 Requirements

- The MultiCOM converter can be used on any PC with the following operating systems: MS Windows 11/10/8.1/7/Vista/XP/2000 (incl. the 64bit Windows 11, 10, 8.1, 7).
- The PC must have a free **USB** port (either USB 1 or USB 2 port).

*Caution:* It is highly recommended to connect the **MultiCOM** converter directly to the PC (not via **USB** hubs etc.)

## **3 Installation**

Ensure that you have **Administrator** access rights in your Windows OS before you proceed with the installation.

*Caution:* It is necessary to run the pre-installer before the installation (at the time of the first connection of the **MultiCOM** device) to the computer.

There are two possibilities how to install the MultiCOM pre-installer into the PC:

- as a part of the Clarity installation or
- separately as a standalone product

*Note:* Created COM ports are numbered from the first unused COM number (usually COM3).

### 3.1 The MultiCOM Converter with Clarity

• Install Clarity from the Clarity installation media.

#### Clarity ver. 8.2 and newer:

- MultiCOM driver is part of the *Typical* and *Full* installation. In case you are installing *Custom* installation in the *Choose Component* dialog, unfold the *Utils* section and check the **Multicom** driver.
- Continue with the installation process.

#### Clarity from ver. 2.7 to 8.1:

- Either choose the **FULL** installation which installs appropriate drivers by default or on the *Choose Components* screen unfold the *Utils* section and check the **Multicom** driver.
- Continue with the installation process.

#### Clarity ver. 2.6 and older:

- When selecting the type of installation, choose Custom.
- On the next screen, the **Utils** section (on the bottom of the list) is checked and grayed. Select it and click the *Details...* button.
- In the available selection, check the checkbox next to the **MultiCOM drivers** item and press the *OK* button. Follow the installation process to its end.
- Connect the MultiCOM device to the PC via the supplied USB cable. "Found New Hardware" message will appear on the Windows taskbar and the LED diodes on the MultiCOM will slowly start to light up. Wait until all shine and

the taskbar displays the message "New hardware is installed and ready to use".

## 3.2 The MultiCOM Converter without installing Clarity

• Install the pre-installer found on the **MultiCOM** installation media (run the DPINST.EXE file).

#### *Caution:* Install the pre-installer before plugging in the **MultiCOM** device.

- *Note:* The **MultiCOM** pre-installer on the **Clarity installation media** can only be used during the installation of the **Clarity** software. If new installation/re-installation is needed, the **MultiCOM installation media** should be used instead or the driver should be downloaded from the **DataApex** web pages *www.dataapex.com*.
  - Connect the MultiCOM device to the PC via the supplied USB cable. "Found New Hardware" message will appear on the Windows taskbar and the LED diodes on the MultiCOM will slowly start to light up. Wait until all shine and the taskbar displays the message "New hardware is installed and ready to use".

## **4** Troubleshooting

Unplugging the MultiCOM device from the PC while the PC runs may cause the computer to crash in Windows 2000 operating system with the Service Pack installed. *Solution:* Unplug the MultiCOM from the USB only after the PC has been turned off.

## 4.1 Reinstalling - MultiCOM

Normally the drivers are installed with the **FULL** installation option of **Clarity**. In case they have not been installed, **MultiCOM** will not function properly.

"Windows found driver for your device but encountered an error while attempting to install it. The system cannot find the path specified."

- *Description:* This error message occurs when drivers for **MultiCOM** device have not been installed and will not function properly.
- Solution: Unplug the MultiCOM and plug in again. If this does not solve the problem follow the steps below to reinstall/update the MultiCOM drivers:
  - Locate the item in *Device Manager*. Notice that drivers which are not correctly installed have a warning sign next to them as seen in Fig. 3 on pg. 7.



Fig. 3: Device Manager Window

• Right mouse click the item (e.g. *DataApex, MultiCOM (COM11)*) and select *Properties.* Dialog showing details about the driver will be opened. On the *Driver* tab, select *Update Driver...* 

DataApex, MultiCOM (COM3) Properties	×
General Port Settings Driver Details Events	
DataApex; MultiCOM (COM3)	
Driver Provider: DataApex	
Driver Date: 28.09.2011	
Driver Version: 6.5.0.0	
Digital Signer: Microsoft Windows Hardwa Publisher	are Compatibility
Driver Details View details about the installe	d driver files.
Update Driver Update the driver for this devi	ce.
Boll Back Driver If the device fails after updatir back to the previously installe	ıg the driver, roll d driver.
Disable Device Disable the device.	
Uninstall Device Uninstall the device from the s	system (Advanced).
OK	Cancel

### Fig. 4: Dialog for driver properties

• Select "Browse my computer for driver software" option.

		$\times$
$\leftarrow$	Update Drivers - DataApex, MultiCOM (COM3)	
	How do you want to search for drivers?	
	→ <u>S</u> earch automatically for drivers Windows will search your computer for the best available driver and install it on your device.	
	→ B <u>r</u> owse my computer for drivers Locate and install a driver manually.	
	Cano	el

Fig. 5: Dialog for browsing drivers

• Select "Let me pick from a list of device drivers on my computer" option.

		×
←	Update Drivers - DataApex, MultiCOM (COM3)	
	Browse for drivers on your computer	
	Search for drivers in this location:	
	C:\YLClarity\Bin\HW_DRIVERS\MULTICOM V Browse	
	Include subfolders	
	→ Let me pick from a list of available drivers on my computer This list will show available drivers compatible with the device, and all drivers in the	
	same category as the device.	
	Next	el

Fig. 6: Dialog for driver properties

• Select "Have Disk" option.

		×
←	Update Drivers - DataApex, MultiCOM (COM3)	
	Select the device driver you want to install for this hardware.	
	Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.	
	Show <u>compatible</u> hardware	
	Model	]
	🔄 DataApex, MultiCOM	
	This driver is digitally signed.	
	Tell me why driver signing is important	2
	Next Cancel	

Fig. 7: Dialog for selecting device driver

• Locate the driver in the installation directory, HW\_DRIVERS\MULTICOM subfolder and press 2x Open.

		Locate File						×
		Look jn:	E MULTICOM	1	~	G 🤌 📂		
Install From Disk	×	Home	Name	^	Date modif 23.06.2023	ied 11:14	Type File folde	r
Inset the manufacturer's installation disk, and then make sure that the correct drive is selected below.	DK. ancel	Desktop	Mullicow		21.00.2025	14:31	INFERE	
Copy manufacturer's files from: C:VYLClashy/Bin/Hw_DRIVERS\CDLIBRICK	wse	This PC						
		Network	File name: Files of type:	MultiCOM.inf		~		Open Cancel

Fig. 8: Dialog for locating the driver Setup Information filetype

• Finish the reinstallation by pressing the Next button

		×
←	Update Drivers - DataApex, MultiCOM (COM3)	
	Select the device driver you want to install for this hardware	
	Select the device driver you want to install for this hardware.	
	Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.	
	Show <u>c</u> ompatible hardware	
	Model	
	🔄 DataApex, MultiCOM	
	This driver is digitally signed.	]
	Tell me why driver signing is important	
	Next Cancel	

Fig. 9: Dialog for finishing driver reinstallation.

• Upon successful reinstallation of drivers for **MultiCOM** you will be presented with dialog as seen in **Fig. 10** on pg. **11**.



Fig. 10: Successful reinstallation of a MultiCOM driver.

- Repeat the aforementioned steps for any other non-functional drivers.
- *Caution* Reinstall/update of drivers may result in assigning a different COM number, for correct communication with **Clarity** check the appropriate setup.
  - If you encounter any difficulties, please contact **DataApex** Support (www.dataapex.com).

## 4.2 Changing COM port assignment

In case there is a need to change the **COM** port assignment of the **MultiCOM** device, it can be done via the *Device Manager*.

#### Changing the assigned COM port number.

Description: In some cases when a new **USB** device is plugged into the **USB** port a new **COM** port is assigned to it. Some drivers do not support **COM** port numbers higher than 100.

Solution: To change the assigned COM port follow the steps bellow:

 Go to Device Manager and locate the item where you want to change the assigned COM port. Right mouse click the item (e.g. DataApex, MultiCOM (COM8)) and select Properties. Dialog with details about the driver will be opened. On the Port Settings tab click on Advanced button.

ionoral	Port Settings	Driver	Detaile	Evente	
onordi	coungo	DUAG	Dotails	L TOTRS	
		<u>B</u> its p	er second:	9600	~
			<u>D</u> ata bits:	8	~
			Parity:	None	~
			<u>S</u> top bits:	1	~
		Ek	ow control:	None	~
			A	vanced	<u>R</u> estore Defaults

Fig. 11: Device Manager - Port Settings tab

- Fig. 12 on pg. 13. displays the *Advanced Settings* for specific COM port. ① To change COM port from the default, choose a COM port at ② using the drop-down list.
- Note Already assigned COM ports have next to the COM port number inscribed "(in use)". Assigning COM port that is already "(in use)" may result in malfunction and will trigger a message as seen in Fig. 13 on pg. 13.. Clicking Yes will change the COM port to the selected one from the drop-down list. It is advised to assign only free COM ports i.e. COM ports not followed by "(in use)".

Advanced Settings	for COM8	D						×
Select lowe	ouffers (requi er settings to ier settings fo	es 16550 corr correct conne r faster perforr	patible UART ction problem: nance.	) s.				OK Cancel
<u>R</u> eceive Buffer:	Low (1)				ļ	High (14)	(14)	<u>D</u> efaults
$\underline{\mathbf{I}}$ ransmit Buffer:	Low (1)				Ţ	High (16)	(16)	
CDM Port Number:	COM6 (in	use) 🗸 2						

Fig. 12: Advanced Settings

• Clicking *OK* will change the assignment of the selected **COM** port to the selected one from the drop-down list.

Commur	ications Port Properties	×
1	This COM name is being used by another device (such as another com port or modem). Using duplicate names can lead to inaccessible devices and changed settings. Do you want to continue?	L
	Yes No	

Fig. 13: Message of assigning already used COM port

- Once the COM port has been successfully changed you can locate the new assigned COM port in the *Device Manager*.
- To change the assignment of other **COM** ports, repeat previous steps.

## 4.3 How to clean up COM ports that are "(in use)"

Over time it may happen that excessively large number of COM ports is "in use".

#### Cleaning up the COM ports that are in "(in use)".

- *Description:* When **COM** port number is above 100, e.g. **COM120**, it may happen that the communication between **MultiCOM** device and **Clarity** will not work. This is caused by the fact that most control modules do not support **COM** port higher than 100.
- Solution: Before manually assigning the COM ports as described in the chapter "Changing COM port assignment" on pg. 12. You will first need to clean up the COM ports " (in use)". Follow the steps below:
  - In the Start menu, type regedit and hit enter. You will be prompted with a message: "Do you want to allow the following program to make changes to this computer?" After clicking Yes, window as seen in Fig. 14 on pg. 14. will be opened.

📑 Registry Editor				-	×
<u>File Edit View Favorites H</u> elp					
Computer\HKEY_LOCAL_MACHINE\SYSTEM\Cu	urrentControlSet\Cont	rol\COM Name Arbiter	\Devices		
- 🚞 BGFX	Name	Туре	Data		
Bittocker Bittocker Bittocker Bittocker Bittocker Bittocker Bittocker Cl Cl Cl Cl Cl Class Classpap CloudDomainJoin COMF COMF	Name	lype REG_SZ REG_BINARY	Usta (value not set) 58 00 00 00 00 00 00 00 00 00 00 00 00 00	0 00 00	
CONVersionsailers CONVersione Arbiter CommonGlobUserSet Compatibility Compatibility Compatibility ContentIndex ContentIndex CrashControl					

Fig. 14: Registry Editor

- Navigate to Computer\HKEY\_LOCAL\_MACHINE\SYSTEM\ CurrentControlSet\Control\COM Name Arbiter
- Right mouse click on the **ComDB** name and select *Modify...*. You will be presented with similar data as in **Fig. 15** on pg. **14**.

Edit Binary	y Value								×
Value name:									
ComDB	ComDB								
Value data	1:								
0020	00	00	00	00	00	00	00	00	
0028	00	00	00	00	00	00	00	00	
0030	00	00	00	00	00	00	00	00	
0038	00	00	00	00	00	00	00	00	
0040	00	00	00	00	00	00	00	00	
0048	00	00	00	00	00	00	00	00	
0050	00	00	00	00	00	00	00	00	
0058	00	00	00	00	00	00	00	00	
0060	00	00	00	00	00	00	00	00	
0068	00	00	00	00	00	00	00	00	
0070	00	00	00	00	00	00	00	00	
									OK Cancel

Fig. 15: Registry Editor - modifying ComDB

• Select all the data in the field Value data and **delete** them manually. Click *OK*. When you try to *Modify...* the **ComDB** again you should be presented with cleaned up window as seen in **Fig. 16** on pg. **15**..

Edit Binary Value	×
Value name:	
ComDB	
Value data:	
0000000	
	OK Cancel

Fig. 16: Registry Editor - cleaned up ComDB

- After cleaning up the COM ports you need to restart your PC.
- After the restart all the COM ports should be free.
- To assign a different COM port, see the chapter "Changing COM port assignment" on pg. 12.

# **5** Tables and specifications

### Description of the DB9M connector

The particular pins of the MultiCOM DB9M connectors are used as follows:



Fig. 17: DB9M connector scheme

Tah	1.	Description	of the	connector	nins <sup>.</sup>
rap.	1.	Description	or the	CONTRECION	pins.

Pin	Name	Direction	Description
1	CD	<i>←</i>	Carrier Detect
2	RXD	$\leftarrow$	Receive Data
3	TXD	$\rightarrow$	Transmit Data
4	DTR	$\rightarrow$	Data Terminal Ready
5	GND		System Ground
6	DSR	$\rightarrow$	Data Set Ready
7	RTS	←	Request to Send
8	CTS	←	Clear to Send
9	RI	$\leftarrow$	Ring Indicator

Tab. 2: Complete possibilities of channel configuration:

Parameter	Value
Data Bits	5, 6, 7 or 8
Stop Bits	1, 1.5 <sup>a</sup> or 2
Parity Type	None, Even, Odd, Mark, Space
Baud Rates	300, 600, 1200, 1800, 2400, 4000, 4800, 7200, 9600, 14400, 16000, 19200, 28800, 38400, 51200, 56000, 57600, 64000, 76800, 115200, 128000, 153600, 230400, 250000, 256000, 460800, 500000, 576000, 921600 <sup>b</sup>

#### Notes:

 $\mathbf{a} - 5$ -bit only

 $\mathbf{b}$  – 7 or 8 data bits only

Tab. 3: Technical data:

Parameter	Value
Converter type:	USB to RS232
Number of COM ports:	6, unisolated

Parameter	Value
USB ports:	1 port to the PC, 1 free port for the HW key or other low consumption device
USB port connectors:	USB-A
Dimensions:	120 x 105 x 22 mm
Weight:	280 g
Power supply:	from the PC via the USB cable or external: stabilized 6V/0.5A
External power supply connector:	plug 1.3mm (outer diameter 3.4 or 3.5 mm)