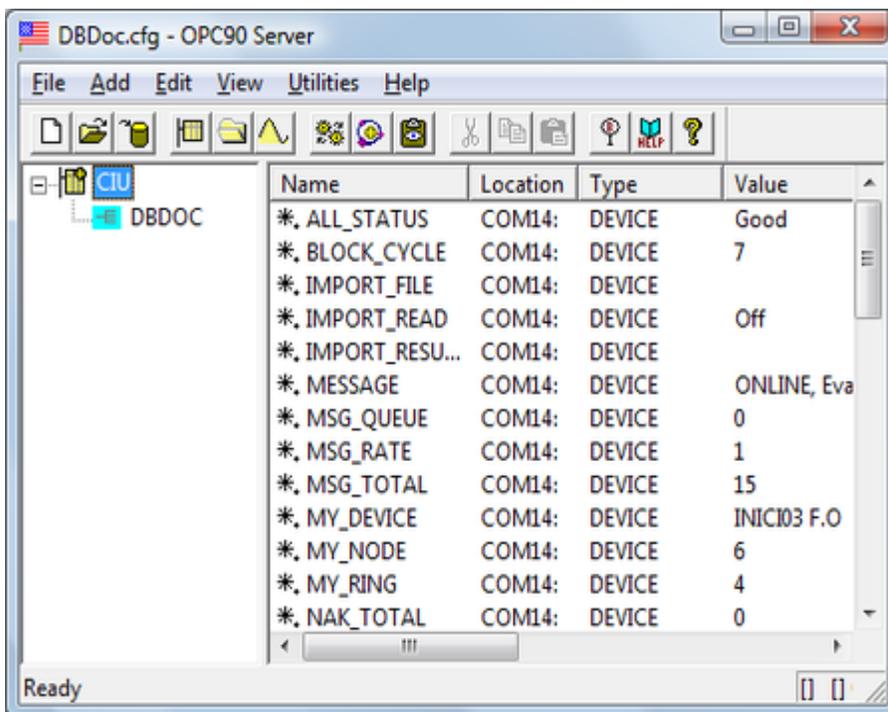


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1 Connecting to RoviSys OPC90 (Turbo)



Follow these steps to connect DBDOC to your CIU using RoviSys OPC90 (Turbo):

1. Install RoviSys OPC90 (Turbo) on a computer that connects to a CIU.
2. Connect RoviSys OPC90 (Turbo) to your CIU.
3. Connect CIUMon to RoviSys OPC90 (Turbo).
4. Set up RoviSys OPC90 (Turbo) to accept connections from any programs CIUMon is sharing the CIU with (such as WinCAD or Composer).

Note: These instructions are for RoviSys OPC90 (Turbo) version 7.2 or later. If you are using an older version of RoviSys OPC90 (Turbo), we recommend you upgrade. If you must connect CIUMon to an older version of RoviSys OPC90 (Turbo), contact G.Michaels Consulting for instructions.

1.1 Installing RoviSys OPC90 (Turbo)

A trial version of RoviSys OPC90 (Turbo) is included with DBDOC. The installer for the trial version is located in either **C:\Program Files\DBDOC\PROGRAMS\RoviSys** or **C:\DBDOC\CIUMON\Programs\RoviSys**, depending on how CIUMon was installed.

Note: The RoviSys OPC90 (Turbo) demo will run for up to two hours per day. It expires permanently and stops working one year after it is released. The demo on the DBDOC install DVD may have expired since the DVD was made. To get the newest and best version of the demo, download it from http://www.rovisys.com/Products/ICSP_opc_server_for_bailey.aspx. There is also a link to the RoviSys OPC90 (Turbo) demo download page on <http://www.gmcl.com/downloads>.

To continue using RoviSys OPC90 (Turbo), you will need to purchase a license from RoviSys or G. Michaels Consulting.

Note: You may need to uninstall the demo version of RoviSys OPC90 (Turbo) when upgrading to the full version. Upgrading to a newer version of RoviSys OPC90 (Turbo) may also require you to uninstall the old version. Before uninstalling RoviSys OPC90 (Turbo), we recommend backing up your configuration: in RoviSys OPC90 (Turbo), on the **File** menu, click **Save As** and save a copy of the configuration file to a backup folder.

1.2 Connecting RoviSys OPC90 (Turbo) to a CIU

1. On RoviSys OPC90 (Turbo)'s **File** menu, click **Open**. Open DBDOC.cfg, which is in **C:\Program Files\OPC90 Server\CFG** if RoviSys OPC90 (Turbo) is installed in the default location.
2. Right-click **CIU** in the left-hand pane, then click **Properties**.
3. In the **Primary Port** list, click the COM or SCSI port that is connected to the CIU.

Note: If you are using RoviSys OPC90 (Turbo) on a computer with EWS software, you might want to move the CIU to a different port to avoid changing the EWS software configuration.

4. Make any other changes you need, in order configure how RoviSys OPC90 (Turbo) communicates with your CIU. Click **OK**.
5. If the CIU is connected to a COM port, set up that port. On the **Edit** menu, click **Ports**. In the **Port** list, click the port that is connected to the CIU. Set the baud rate and other settings to match the CIU. Click **OK**.

Note: RoviSys OPC90 (Turbo) ports default to 19200 Baud with other settings that are normally correct.

6. If you want to log data, right-click CIU and select each of the first four logging options.
7. On the **File** menu, click **Save**.

Note: If you are using RoviSys OPC90 (Turbo) on a computer with User Account Control (UAC) enabled, you may not be able to save the configuration in the default folder. Choose another folder in which to save the configuration.

Using OPC90 with DBDOC - Bailey™ WinCAD or Composer

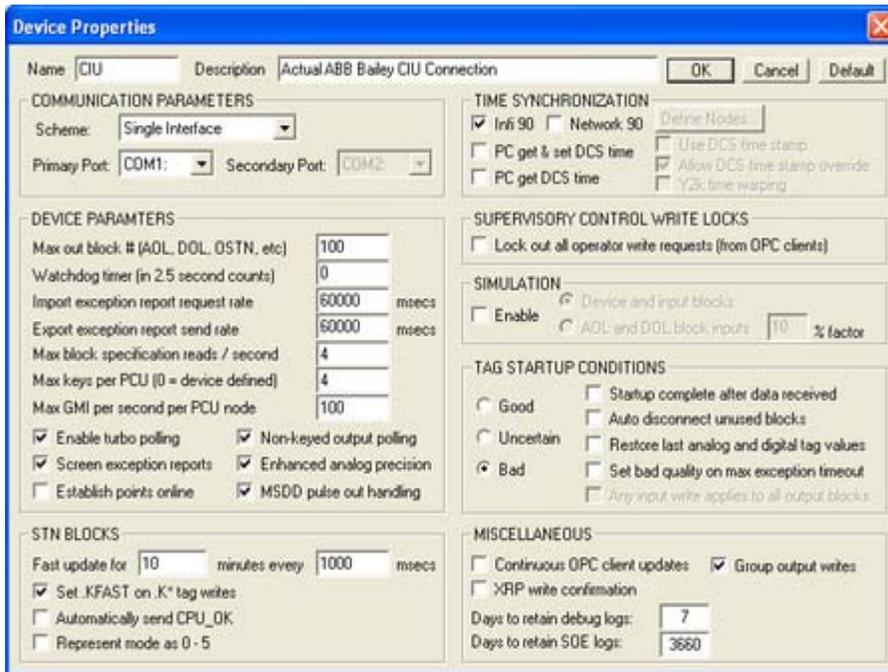
8. Start the connection to the CIU to make sure it works: on the **View** menu, click **Monitor**. After a moment, the text "CIU: ONLINE" will appear in the RoviSys OPC90 (Turbo) status bar. You must see **MyRing** and **MyNode** having non-zero values, except for Plant Loop, in which case **MyRing** will be zero.

To configure RoviSys OPC90 (Turbo)'s communications with your CIU:

- In RoviSys OPC90 (Turbo), right-click **CIU** in the left-hand pane, then click **Properties**. The **Device Properties** window appears.

For most people using DBDOC, we recommend that you:

- Change the **Import exception report request rate** to **60000 ms**, unless you are using OPC tags.
- Select the **Enable Turbo Polling** check box.
- Select the **Non-keyed output polling** check box.
- Select the **Enhanced Analog Precision** check box.



Normally, programs like Composer and DBDOC must get data from your system one block at a time, but "turbo mode" allows RoviSys OPC90 (Turbo) to fetch multiple blocks at once. Using turbo mode, you can get data more quickly, while reducing the load on your system.

If you are having problems getting data with turbo mode, please contact G. Michaels Consulting for help. We will work with RoviSys to make sure that you can get data reliably while benefiting from turbo mode's higher speeds and reduced load on your system. Meanwhile, to make sure that you are always able get data, you can temporarily disable turbo mode.

To disable turbo mode:

- Clear the **Enable Turbo Polling** box.

To enable turbo mode:

- Select the **Enable Turbo Polling** box.

Depending on how much data is being asked for, RoviSys OPC90 (Turbo) can make multiple requests for data at once by using different "keyed" requests. However, you can usually get data more quickly if RoviSys OPC90 (Turbo) is making only one request at a time. So, for most situations, we recommend setting RoviSys OPC90 (Turbo) to make only one request at a time by selecting the **Non-keyed output polling** box.

1.3 Methods of connecting CIUMon to RoviSys OPC90 (Turbo)

There are two ways to connect CIUMon and RoviSys OPC90 (Turbo):

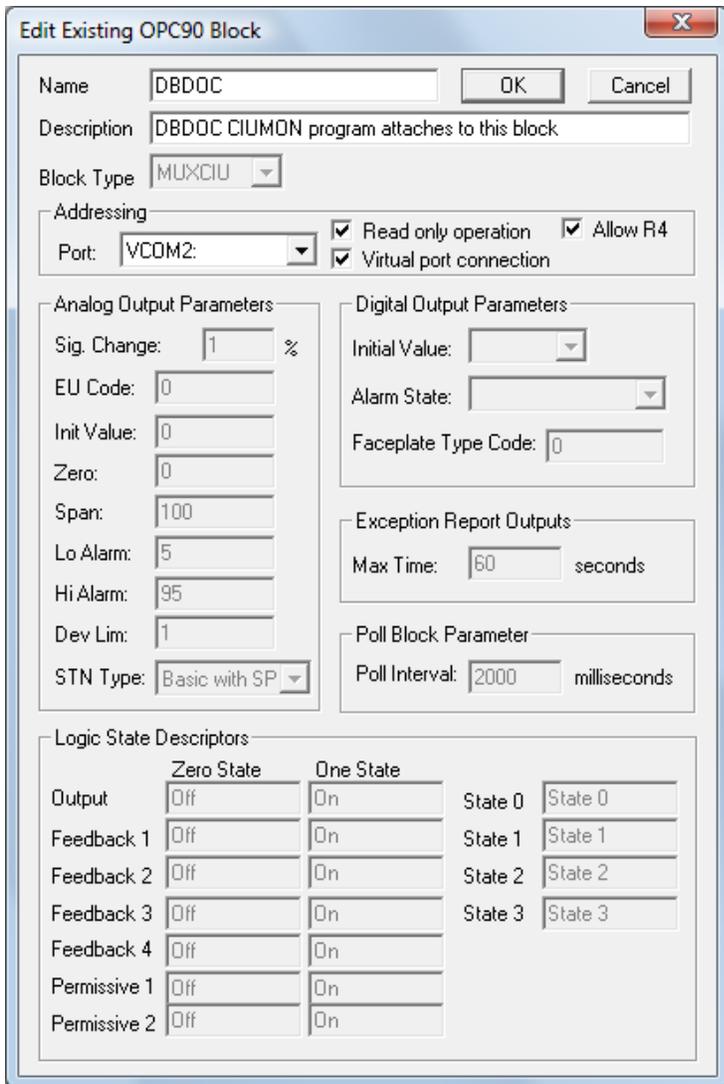
- **RoviSys OPC90 (Turbo) virtual ports** are easy to set up and provide high data rates. If RoviSys OPC90 (Turbo) and CIUMon are on different computers, they can still be connected with RoviSys OPC90 (Turbo) virtual ports through the network. RoviSys OPC90 (Turbo) virtual ports require RoviSys OPC90 (Turbo) 7.2 or newer and CIUMon 10.4 or newer.
- **Serial ports** are generally harder to set up and slower. Some system managers may choose to use serial ports if RoviSys OPC90 (Turbo) and CIUMon are on different computers, in order to keep OPC data off the network. Serial ports can also be used with older versions of RoviSys OPC90 (Turbo) and CIUMon.

1.4 Connecting to RoviSys OPC90 (Turbo) with virtual ports

To connect CIUMon to RoviSys OPC90 (Turbo) by using RoviSys OPC90 (Turbo) virtual ports:

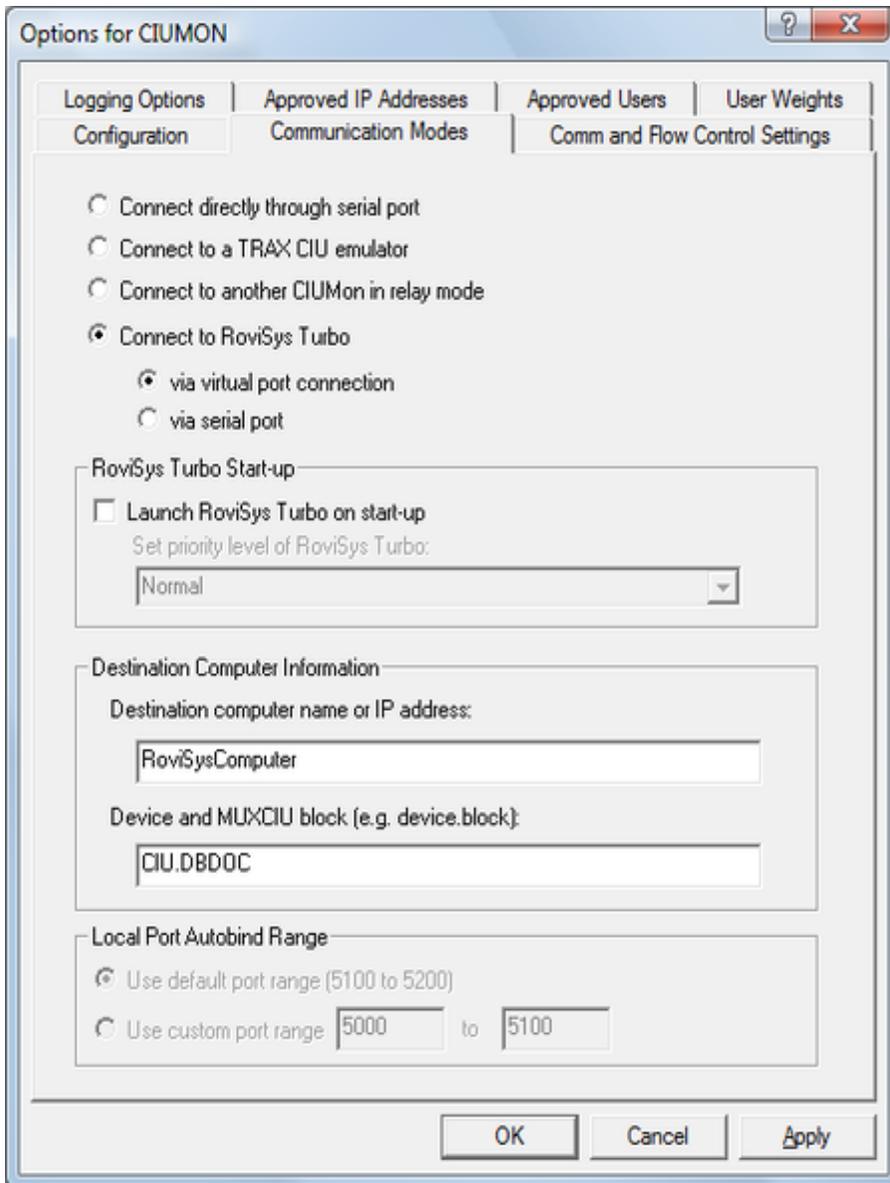
1. Configure the virtual ports in RoviSys OPC90 (Turbo)
2. Set up CIUMon to connect to the RoviSys OPC90 (Turbo) virtual ports

To set up RoviSys OPC90 (Turbo):



1. In RoviSys OPC90 (Turbo), stop the connection to the CIU: on the **View** menu, clear the **Monitor** check mark.
2. Expand **CIU** in the left-hand pane. Right-click **DBDOC**, then click **Properties**.
3. Select **Virtual port connection**.
4. In the **Port** list, select a different port from the one the CIU is using.
5. Select **Read only operation** and **Allow R4**.
6. Click **OK**.
7. On the **File** menu, click **Save**. Then, start the connection to the CIU: on the **View** menu, click **Monitor**.

To set up CIUMon:



1. On CIUMon's **Options** menu, click **Settings**. Choose a UDP port, and select your CIU type.
2. Click the **Communication Modes** tab. Select **Connect to RoviSys OPC90 (Turbo)** and **via virtual port connection**.
3. Type the IP address or hostname of the computer running RoviSys OPC90 (Turbo) in the **RoviSys computer name or IP address** box.
4. If you changed the name of the **CIU** or **DBDOC** blocks in RoviSys OPC90 (Turbo)'s left hand pane, change the **Device / MUXCIU block name** box to match.
5. If you know that any of the other settings need to be changed for your setup, change them now. Usually the defaults are fine.
6. Click **OK** to close the Options window. Then, make sure you can get data from your CIU.

1.5 Connecting to RoviSys OPC90 (Turbo) with serial ports

To connect CIUMon to RoviSys OPC90 (Turbo) by using serial ports:

1. Set up a pair of serial ports on your computer
2. Configure RoviSys OPC90 (Turbo) to provide data to one port
3. Configure CIUMon to connect to the other port

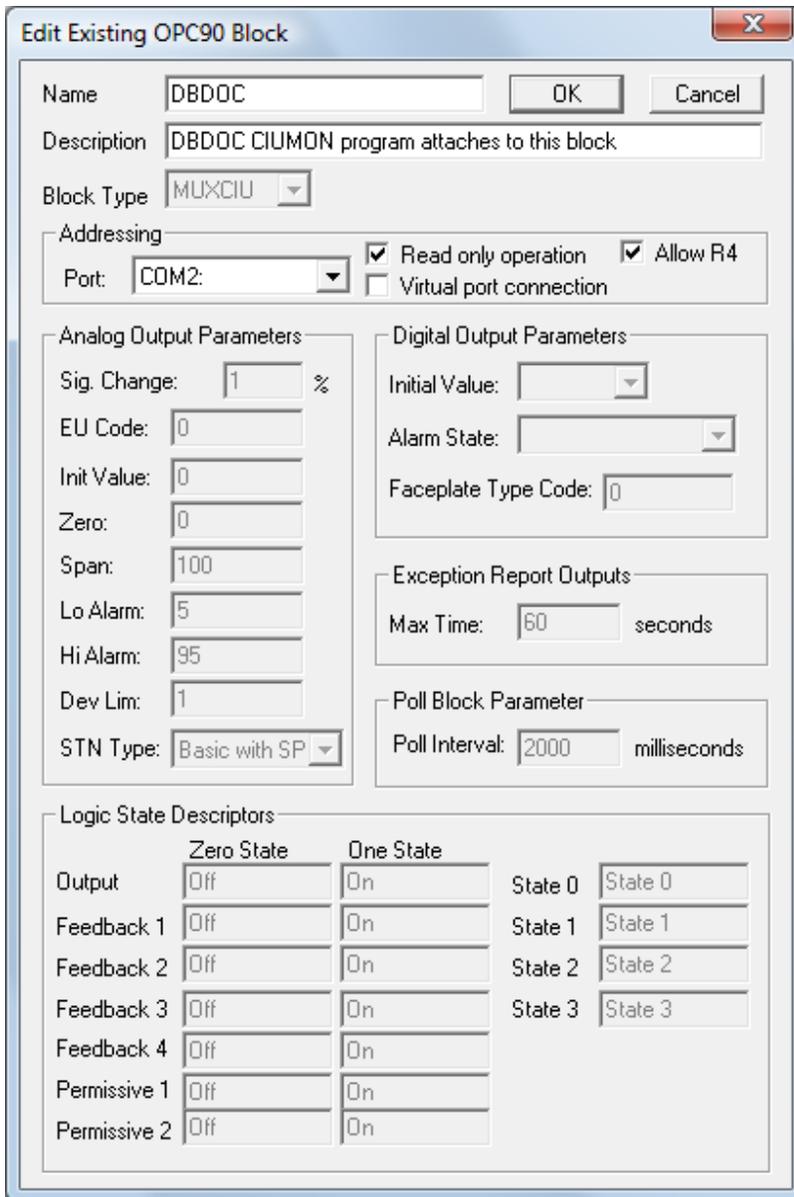
To set up the serial ports:

1. If RoviSys OPC90 (Turbo) is running, exit RoviSys OPC90 (Turbo): on the **File** menu, click **Exit**.
2. Connect two serial ports with a null-modem cable for CIUMon and RoviSys OPC90 (Turbo) to communicate with each other through. RoviSys OPC90 (Turbo) will connect to one of these ports, and CIUMon will connect to the other.
3. Write down which ports you set up and which program you plan to connect to each of them.

Notes:

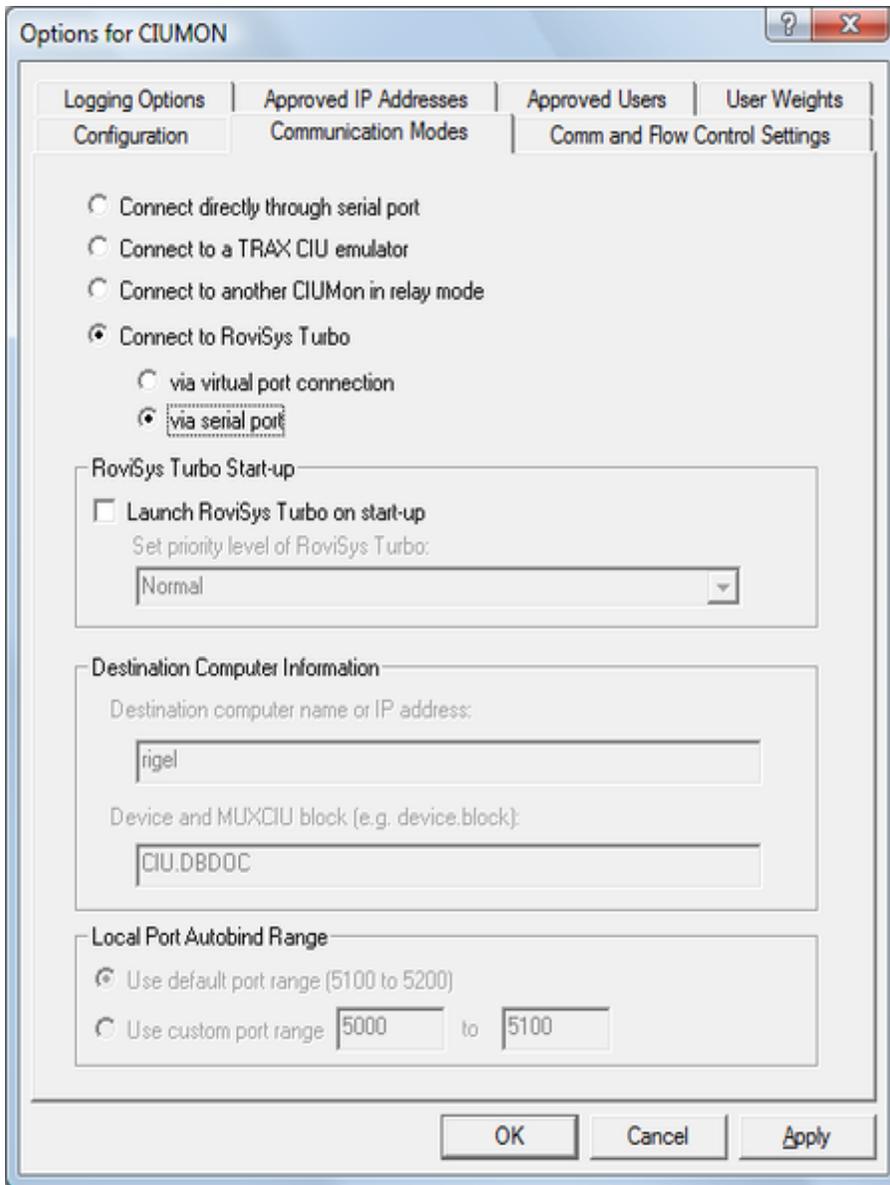
- Very old versions of RoviSys OPC90 (Turbo) cannot connect to serial ports above COM9, but you can use low port numbers for RoviSys OPC90 (Turbo) and higher ones for CIUMon in that case.
- If RoviSys OPC90 (Turbo) and CIUMon are on the same computer, and it does not have a 64-bit operating system, you can use virtual serial ports.
- If RoviSys OPC90 (Turbo) and CIUMon are on different computers or on a computer with a 64-bit operating system, and there are not enough serial ports, you can add more ports with an internal interface card or a usb-to-serial converter. Alternately, you can use a third-party virtual serial port program.

To set up RoviSys OPC90 (Turbo):



1. Start RoviSys OPC90 (Turbo).
2. Expand **CIU** in the left-hand pane. Right-click **DBDOC**, then click **Properties**.
3. In the **Port** list, click the port that you set up for RoviSys OPC90 (Turbo). Select **Read only operation** and **Allow R4**. Click **OK**.
4. On the **Edit** menu, click **Ports**. In the **Port** list, click the port that RoviSys OPC90 (Turbo) was set to use in the previous step. Set the baud rate to **57600**. Click **OK**. **115200** is overly vulnerable to ambient interference and should not be used.
5. On the **File** menu, click **Save**. Then, start the connection to the CIU: on the **View** menu, click **Monitor**.

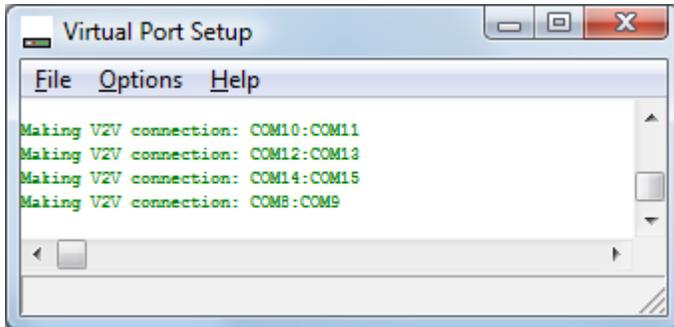
To set up CIUMon:



1. On CIUMon's **Options** menu, click **CIUMon Settings**. Choose a UDP port, and select your CIU type.
2. Click the **Communication Modes** tab. Select **Connect to RoviSys OPC90 (Turbo)** and **via serial port**. (**Connect directly through serial port** can be used instead, but there is some loss of performance using that option.)
3. Click the **Comm and Flow Control Settings** tab. Select the serial port you set up earlier for CIUMon in the **Serial Port** list. In the **Baud Rate** list, click the baud rate of the serial port connected to the CIU.
 **Note:** If you are using virtual serial ports, this setting doesn't matter.
4. If you know that any of the other settings need to be changed for your setup, change them now. Usually the defaults are fine.

5. Click **OK** to close the Options window. Then, make sure you can get data from your CIU.

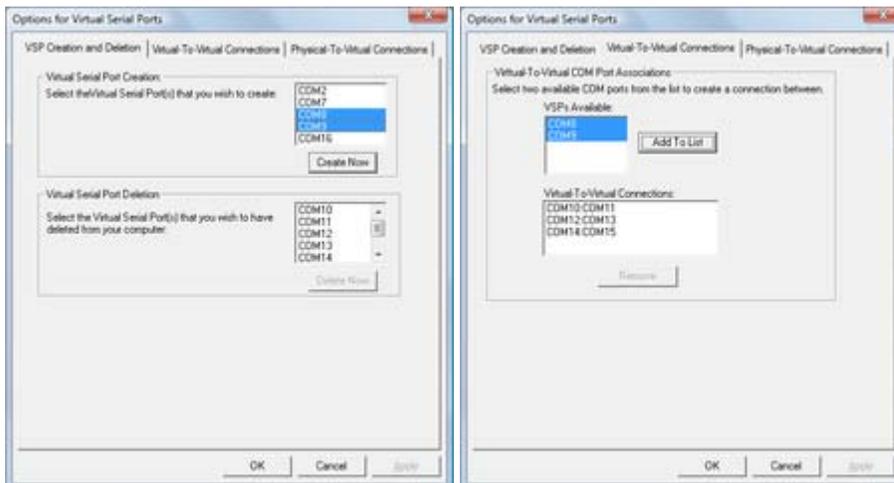
1.6 Adding serial ports to your computer



RoviSys OPC90 (Turbo) may connect to CIUMon or your EWS software through a serial line. To do so, RoviSys OPC90 (Turbo) and the other program must each have a COM port, and these ports must be connected. In many cases, if RoviSys OPC90 (Turbo) and the other program are running on the same computer, they can connect through virtual serial ports rather than real serial ports.

- Instead of using serial ports, CIUMon can connect to RoviSys OPC90 (Turbo) using RoviSys OPC90 (Turbo) virtual ports.
- On 32-bit platforms, you can connect your EWS software to RoviSys OPC90 (Turbo) using virtual serial ports included with DBDOC.
- The included virtual serial ports do not work on 64-bit Windows platforms (including Windows 7). To add serial ports to one of these platforms, use a usb-to-serial converter, or better, use internal serial ports on the motherboard or install a PCI serial card. Alternately, you can use a third-party virtual serial port program.

To set up virtual serial ports:



1. On the CIUMon **Options** menu, click **Virtual Serial Port Setup**. The Virtual Port Setup program will open.
2. On the Virtual Port Setup **Options** menu, click **VSP Configuration**.
3. In the **Virtual Serial Port Creation** list, click any port. Hold down CTRL and click a second port. Click **Create Now**. The two ports that were selected will disappear from the **Virtual Serial Port Creation** list and appear in the **Virtual Serial Port Deletion** list.
4. Click the **Virtual-To-Virtual Connections** tab.
5. In the **VSPs Available** list, click the first port, then click the second port. Click **Add To List**. The two ports will disappear from the **VSPs Available** list, and the new connection will appear in the **Virtual-To-Virtual Connections** list.

 **Note:**

- The **Virtual Serial Port Setup** option is disabled on 64-bit Windows platforms (including Windows 7). Also, they do not work on Windows 8. To add serial ports to 64-bit Windows, use a usb-to-serial converter. Alternately, you can use a third-party virtual serial port program.
- If you have not run Virtual Port Setup before, it will be installed when you try to run it. You will then be prompted to reboot the computer.
- The first time you set up and try to use virtual serial ports after installing them and rebooting the computer, you may see an **Error: COMx.Read (), code 87** message in the Virtual Port Setup window. If this occurs, reboot your computer again -- the virtual serial ports should work fine after this second reboot.
- If you get a **Could not find OEM file** error after your computer reboots, copy the file "vsp.oem" from the folder where CIUMon is installed to the system32 subfolder of your computer's Windows folder.
- If you later install more physical serial ports, you should delete all of the virtual serial ports and connections first, then re-create them after the new physical ports are installed and working.

To remove virtual serial ports:

1. In **Windows Explorer**, browse to the **PROGRAMS** folder in your installation directory (this is usually in either **C:\Program Files\GMCL\DBDOC** or **C:\DBDOC\CIUMON**).
2. Double-click **VSPCleanup.exe** and follow the instructions.
3. If the computer was not rebooted in the previous step, reboot it now.

To set up internal serial ports:

1. If you are installing a new interface card to add serial ports, you will have to power down the computer and open it up. Identify an unused slot of the type required by the card and remove the corresponding cover from the back of the case. Depending on the number of ports supported by the card, you may also have to connect a *serial port header* to the card and install it in another unused opening in the back of the case.
2. Identify the serial ports you've installed:
 - a. Right-click the **My Computer** icon on the desktop, and then click **Properties**.
 - b. Click the **Hardware** tab, then click the **Device Manager** button.

- c. Expand the **Ports (COM & LPT)** entry. The serial ports should each be listed as **Communications Port (COMn)** or **mumble Serial Port (COMn)**, where *n* is the port number and *mumble* is some descriptive text.
3. Connect two ports with a null modem cable, to provide a connection between them.

To set up a usb-to-serial converter:

1. Plug the converter into an available USB port on your computer.

After a short delay, Windows will recognize and install the converter. When it has finished installing the converter, it will display a message in the system tray.
2. Check that it is installed correctly:
 - a. Right-click the **My Computer** icon on the desktop, and then click **Properties**.
 - b. Click the **Hardware** tab, then click the **Device Manager** button.
 - c. Expand the **Ports (COM & LPT)** entry. The new serial ports should each be listed as **USB Serial Port (COMn)**, where *n* is the port number.
3. Connect two ports with a null modem cable, to provide a connection between them.

 **Note:** GMCL has USB-to-serial converters available for sale. Please contact G. Michaels Consulting for details.

A note about USB-to-serial converters and Windows 7:

On Windows 7 and Windows 2008 Server, USB-to-serial converters do not work as well as internal serial ports. They are slower and have higher error rates. In some cases, they may not work at all. You should use internal serial ports if possible. Alternately, you can use a third-party virtual serial port program.

If you do use USB-to-serial converters on Windows 7 and 2008 Server, do not use speeds above 115200 bps.

If Windows 7 or Windows 2008 Server does not automatically install your USB-to-serial converter, you will need to download drivers from the converter manufacturer's website. The drivers for the USB-to-serial converters sold by GMCL are available at http://www.vscm.de/616_download.htm.

Third-party virtual port alternatives:

As an alternative to RoviSys OPC90 (Turbo) virtual ports, the virtual serial port software included with DBDOC, or physical serial ports, you can use a third-party virtual serial port program to connect CIUMon or your EWS software to RoviSys OPC90 (Turbo).

These software packages can create virtual serial ports for CIUMon or your EWS software to use for connecting to RoviSys OPC90 (Turbo):

- The com0com null-model emulator is an open source virtual serial port driver that supports both 32-bit and 64-bit versions of Windows. Note that to use this program with 64-bit Windows, you will need a signed version of the com0com driver. Contact G. Michaels Consulting for information about obtaining a signed version of the driver.

- [The Eltima Virtual Serial Port Driver](#) is a commercial software package that can create virtual serial ports. It supports both 32-bit and 64-bit versions of Windows.

1.7 Connecting other programs to RoviSys OPC90 (Turbo)

If you are using RoviSys OPC90 (Turbo) to share a serial connection to a CIU between CIUMon and EWS software (such as Composer or WinCAD), you can avoid changing the EWS software settings with the following strategy:

1. Move the CIU connection to a different serial port, and connect RoviSys OPC90 (Turbo) to that serial port.
2. When you set up RoviSys OPC90 (Turbo) to accept connections from the EWS software, connect a null cable between the serial port that the CIU was connected to and a third serial port.
3. Then, have RoviSys OPC90 (Turbo) use the third serial port to communicate with the EWS software. The EWS software will connect to RoviSys OPC90 (Turbo) through the null cable, using the same port as before.

A side benefit of this approach is that you can reconnect the CIU directly to the EWS simply by moving the cable back. If the computer does not have the extra serial ports you need for this approach, you can add serial ports with an internal interface card or a usb-to-serial converter.

To connect other programs to RoviSys OPC90 (Turbo):

1. If RoviSys OPC90 (Turbo) is running, exit RoviSys OPC90 (Turbo): on the **File** menu, click **Exit**.
2. Set up two connected (real or virtual) serial ports for RoviSys OPC90 (Turbo) and the other program to communicate with each other through. Write down the two port numbers. RoviSys OPC90 (Turbo) will connect to one of these ports, and the other program will connect to the other one.

 **Note:** If you moved the CIU connection so you wouldn't have to change settings in the EWS software, then use a connection between the serial port it was originally using and another real serial port.

3. Start RoviSys OPC90 (Turbo) and open the saved configuration.
4. Right-click **CIU** in the left-hand pane, then click **New Block**.
5. Type a name for the block in the **Name** box (e.g. WinCAD).
6. In the **Block Type** list, click **MUXCIU**.
7. In the **Port** list, click the port that you set up for RoviSys OPC90 (Turbo). Click **OK**.
8. On the **Edit** menu, click **Ports**. In the **Port** list, click the port that you set up for RoviSys OPC90 (Turbo) again. Set a baud rate that your EWS software supports (typically **19200**). Click **OK**.
9. Start the connection to the CIU: on the **View** menu, click **Monitor**.
10. Set up the other program to connect to the port you set up for it.