

*Using
VideoRay
PC Pilot*



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1 Introduction



ABOUT PC PILOT

VideoRay PC Pilot allows VideoRays (currently most Pro models and, Deep Blue, see details about applicability in the next section) to be controlled using a PC and video game type controller or joystick. This configuration provides increased flexibility and enables user customization capabilities. Additionally, PC Pilot allows VideoRay, VideoRay partners and users to add control extensions and/or integrate VideoRay control and video display with other systems.

To get the most out of PC Pilot, users should be familiar with basic VideoRay operations before attempting to use PC Pilot. Refer to the operating manual for the VideoRay model you are using

Introduction

Note... In this document, the standard VideoRay controller will be referred to as the “ICB” (Integrated Control Box) to avoid confusion between it and a game type controller.

PC PILOT APPLICABILITY AND REQUIREMENTS

PC Pilot – VideoRay Model Applicability

VideoRay Pro IIIs, Deep Blues and most Pro models are capable of supporting PC control.

For VideoRay Pro and Pro IIs, several possible conditions exist:

First, the ICB's joystick must support third axis control. If the ICB's joystick does not support third axis control, the ICB cannot be PC control enabled.

Second, all other Pro and Pro II ICBs must have their CPU board software chip updated to version 3.1 or greater, and some of these units may need RS-232 hardware support installed. VideoRay, VideoRay dealers, or users who have some electronics experience can easily install the software chip and RS-232 hardware support. For details on upgrading the CPU board for the correct software version and RS-232 support, see the following documents available in the PC Pilot installation package or on VideoRay's website, www.videoray.com:

Chip_Replacement_021203.pdf (Steps 1-3 and 6-8)

VideoRay Tech Note VRTN-1 - RS-232 Hardware Installation on Pro II CPU Board

Note... Any VideoRay Pro or Pro II that has had its CPU board software chip upgraded to version 3.1 or greater will require counter-rotating propellers in order to work under ICB control. Failure to use counter-rotating propellers will make the submersible nearly impossible to control and may result in damage. Under PC Pilot control, there is a selection for using counter-rotating propellers or not. More information about counter-rotating propellers can be found in VideoRay Tech Note VRTN-2 - Counter Rotating Propellers, which is also available in the PC Pilot installation package or on the web.

PC Pilot Applicability and Requirements

PC Pilot Equipment Requirements

A complete, working VideoRay system conforming to the requirements listed above.

Microsoft Windows (Windows 9x, NT, 2000 or XP) PC with an available RS-232 serial port or USB serial adapter.

Serial cable with DB9F - DB9F connectors.

PC Pilot Optional Equipment

Game type controller or Joystick.

2 *Getting Started*



SOFTWARE INSTALLATION

VideoRay PC Pilot software may be downloaded from the Developer section of www.videoray.com. See the readme.txt file that is included with the software for installation instructions. Once installed, you should see the PC Pilot program shortcut in the Windows **Start->Programs->VideoRay** menu.

Note... *If you have already installed a version of PC Pilot and want to preserve it, you will need to select a different directory for the new installation*

Getting Started

FIRST TIME START UP

Note... The first time you run PC Pilot, or if you change or add a new joystick/controller, you may want to start it without a VideoRay connected. This will allow you to configure the joystick/controller without worrying about the lights or thrusters remaining on at high intensity during your configuration. Follow the steps in this section. Once you have configured your joystick/controller, you can bypass this section and follow the start up sequence in the section on Basic Operation. If you change or add a new joystick/controller, it is recommended that you repeat the steps listed in this section.



WARNING! DO NOT OPERATE THE THRUSTERS FOR MORE THAN 20 SECONDS OR LIGHTS FOR MORE THAN 60 SECONDS WHEN THE VIDEORAY IS NOT SUBMERSED. DOING SO MAY CAUSE SEVERE DAMAGE TO THE VIDEORAY

First Time Start Up Sequence

1. Do not connect the PC to the ICB at this time.
2. Boot up the PC.
3. Install the PC Pilot software (as described above, if not already completed).
4. Start the VideoRay PC Pilot software.
 - a) From Windows Start menu, select **Start->Programs->VideoRay->PC Pilot**
 - b) PC Pilot will begin searching the COM ports for a VideoRay, and you should see a dialog box similar to Figure 1.



FIGURE 1.

Joystick / Controller Setup

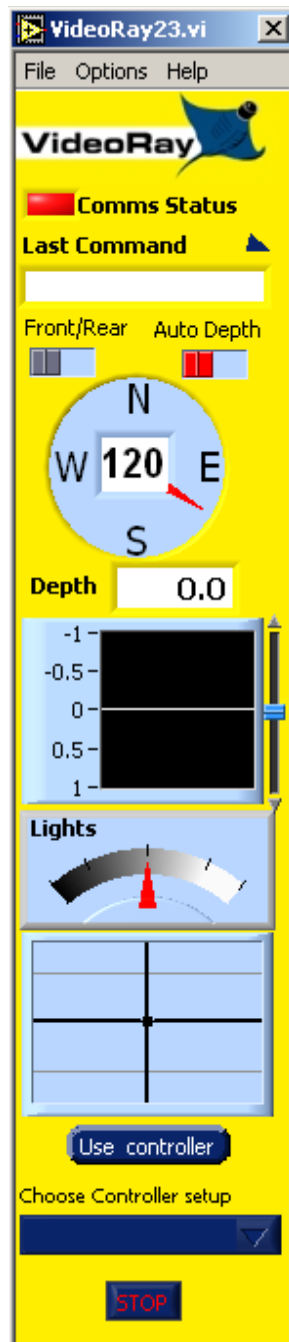


FIGURE 2.

5. Click on the **Continue** button to stop searching for a VideoRay. The dialog will close and the main window shown in Figure 2 will open. This capability allows you to configure your joystick/controller, or run the PC Pilot software as a network client, or in demonstration mode. See the sections on Network Mode or Demonstration Mode for more details.
6. As an alternative to Step 5 you can exit the program by clicking on the **Exit** button.

JOYSTICK / CONTROLLER SETUP

Note... If you do not have a joystick or controller, you will still be able to operate the VideoRay using a mouse. You may skip this section and proceed to Chapter 2 - Basic Operations. See the section on Using PC Pilot without a Joystick or Controller for more details.

If this is the first time starting PC Pilot, or you have just attached a new joystick or controller, you need to configure the joystick or controller. Select **Options->Setup->Joystick / Controller** from the PC Pilot main menu. See Figure 3.

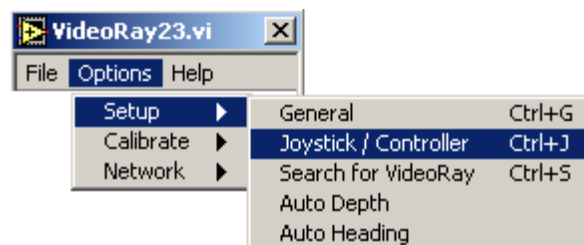


FIGURE 3.

Getting Started

The Controller Setup dialog, shown in Figure 4, will open.

Note... The joystick / controller will not control the VideoRay while the Controller Set-up dialog is open.

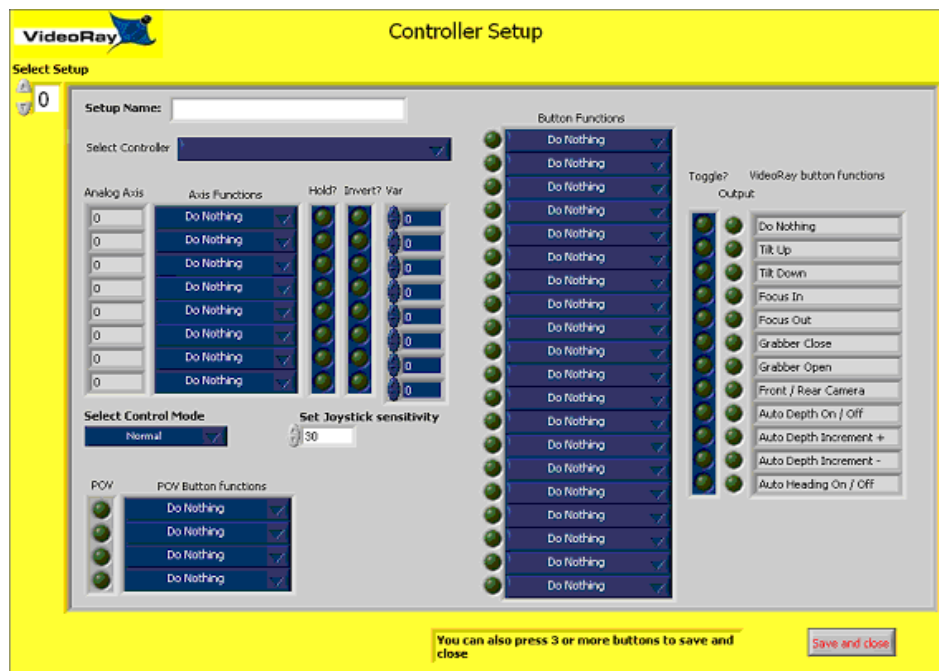


FIGURE 4.

You will notice there are several groupings of the axes and buttons. Initially the axes and buttons are typically unmapped, but some of them may also be mapped randomly. The setup process requires you to map the joystick's/controller's axes and buttons to VideoRay functions. This is usually a trial and error process, because joystick and controller outputs may vary from model to model. If you have more than one controller attached to your computer, you will first need to select the desired controller from the **Select Controller** pull-down.

Note... PC-Pilot dialog boxes include tool tips, which pop up when you hover your mouse over an item.

Begin by thinking about how you would like to use your joystick/controller. For a multi-axis controller, you might want the left joystick to control forward/backward and left/right, and the right joystick to control depth. You could map buttons for camera functions, auto-depth and the gripper.

Mapping Joystick Axes

Using the previous example, first displace the left joystick forward or backward. When you do this, you will notice that the value of one of the analog axis readouts within the **Analog Axis** section of the dialog will change (more than readout one might change slightly, but only one should change significantly). For that readout, change the associated axis function using the pull-down to the readout's right. Change **Do Nothing** to **Forward / Backward** for this example. Repeat this process using the left joystick's left / right motion and map it to the **Left / Right** function, and map the right joystick's forward / backward motion to **Vertical Up / Down**. Once you determine which readout is associated with each joystick movement, you can map that movement to any of the compatible VideoRay functions, which are listed in Table 1.

Joystick Axis Functions
Do Nothing
Forward / Backward
Left / Right
Vertical Up / Down
Lights Bright / Dim
Left Thruster
Right Thruster

TABLE 1.

Joystick Axes Invert and Hold

There are two additional features regarding analog axis mapping - **Invert** and **Hold**.

Invert is used to reverse the “polarity” of the mapping. If pushing the joystick forward results in a negative number in the readout (or a reversed response on the VideoRay), you may want to activate Invert for that axis by clicking on the associated button in the Invert column. Otherwise, the motion of the VideoRay might be in the reverse direction or the lights may dim when you want them to brighten. When activated, the Invert button glows green.

Normally, when Hold is not activated, the *response* is directly proportional to the joystick displacement. This works well for the thrusters, but may not be desirable for controlling the lights because you would be forced to maintain the joystick displacement to keep the lights at a fixed intensity. By using the Hold feature, the *change in the response* is proportional to the displacement. When there is no displacement, the response remains constant. Displacing the joystick slightly will

Getting Started

cause the response to change slowly, and increasing the displacement will cause a more rapid change in the response. When Hold is activated, the Hold button glows green. The sensitivity, or responsiveness, of the Hold feature can be adjusted by entering a number in the **Var** column. Entering “0” leads to an almost instantaneous response. Increasing the number in the Var column results in longer response times.

There is also an overall joystick sensitivity that can be adjusted by entering a number in the **Joystick Sensitivity** field. Entering a low number results in more sensitivity, or another way to say it is, “*small number - small (short) response time.*”

Mapping Joystick Buttons

Joystick / Controller buttons can be mapped in a similar manner. For buttons, the readout is just an on / off indicator light. Pressing a button should light one of the button readout indicators. Once a button and its on / off readout pairing is determined the desired VideoRay function can be selected from the associated pull-down. There are typically two types of buttons: POV (Point of View) and normal buttons. Both type of buttons share the same list of compatible VideoRay functions, which are shown in Table 2.

Joystick Button Functions
Do Nothing
Tilt up
Tilt Down
Focus In
Focus Out
Grabber Close
Grabber Open
Front / Rear Camera
Auto-Depth On / Off
Auto-Depth Increment +
Auto-Depth Increment -
Auto Heading On / Off

TABLE 2.

Joystick Button Toggle

Button mapping includes an additional **Toggle** feature. Normally, with joysticks, the state of a button press is only maintained while the button is depressed. When the

button is released, the state reverts to its original condition. Toggle causes the function to change its state and hold the new state with each button press. The effect can best be illustrated using the front and rear camera. Pressing and releasing the button would switch to the rear camera only while the button is pressed. Releasing the button would revert the display to the front camera. You would need to hold the button down in order to continue to view the display from the rear camera. However, with Toggle on, pressing and releasing the button would switch from the front to the rear camera. Pressing and releasing the button again would switch back. There is no need to continue to hold the button.

Button Mapping Confirmation

On the right hand side of the dialog is a display that indicates the results of the current button mappings. When you press a button, you should see a green light appear next to one of the functions. If no lights appear, that button is not mapped to any function. You can use this output to confirm your settings.

Naming Joystick Configurations

Once you have configured your joystick/controller, type a name in the **Setup Name** field and click the Save and Exit button.

You are now ready to connect to a VideoRay and begin using PC Pilot to operate it. Operation is described in the next Chapter.

Multiple Joystick / Controller Setups

More than one joystick/controller configuration can be saved and easily recalled. This may be convenient if you have more than one controller type or more than one person using the VideoRay. Each controller set-up is given a numeric ID. This number is displayed in the upper left of the Controller Setup dialog, and is labeled **Select Setup**. To create a new controller set-up, you can either type in an ID number, or use the scroll buttons to increment the ID number. If the number has not been used, the dialog will be dimmed. Typing a Setup Name or clicking on a pull-down or button in the dialog will initiate the new set-up.

When you open the Controller Setup dialog, you are momentarily given the option to select the desired set-up by name. If you do not make a selection, PC Pilots defaults to the most recently used set-up. You can select a different set-up by changing the Select Setup to the desired ID number.

3 *Basic Operation*



HARDWARE SET-UP

You should prepare your VideoRay and ICB as normal, however do not turn on the ICB. Connect a serial DB9F-DB9F cable from the ICB RS-232/AUX port to a working serial port on the PC.

Note... If you have a Pro II, you must make sure that the ICB PCU board software chip is version 3.1 and is configured with RS-232 hardware. See:

Chip_Replacement_021203.pdf (Steps 1-3 and 6-8)

VideoRay Tech Note VRTN-1 - RS-232 Hardware Installation on Pro II CPU Board for details.

STARTING PC PILOT

Once the hardware is connected, the required start up sequence is to start the PC Pilot program, and then turn on the ICB. This sequence is required because the ICB will only poll the RS-232 port during the first 5 seconds. If no PC connection is found, the ICB will commence operation in local mode, and the PC Pilot software will not be able to detect or control the VideoRay.

Note... *If this is the first time starting PC Pilot and you have a VideoRay connected, you will need to set up the joystick or controller. See the previous chapter for details. If you have already configured PC Pilot, you can begin operating the VideoRay immediately.*



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Proper Sequence for PC Pilot Start Up

1. Connect the VideoRay to the ICB as usual, but do not turn on the ICB.
2. Connect the ICB RS-232/AUX to the PC serial port using a serial DB9F-DB9F cable.
3. Boot up the PC, if it is not already running.
4. Start the VideoRay PC Pilot software.
 - a) From Windows Start menu, select Start->Programs->VideoRay->VideoRay
 - b) PC Pilot will begin searching the COM ports for a VideoRay, and you should see a dialog box similar to Figure 1 (in the previous chapter).
5. Turn on the ICB. PC Pilot should detect the VideoRay and begin communicating with it. The dialog box in Figure 1 will close, and the PC Pilot main window shown in Figure 2 (in the previous chapter) will open.

OPERATING A VIDEORAY USING PC PILOT

When PC Pilot is running, control and feedback is available through the joystick/controller and the PC Pilot main window. The ICB controls will not be functional, although the LCD display will continue to display its data as usual.

4 *Sections to be Added*

Using PC Pilot in Network Mode

Using PC Pilot in Demonstration Mode

Using PC Pilot without a Joystick or Controller

Sections to be Added
