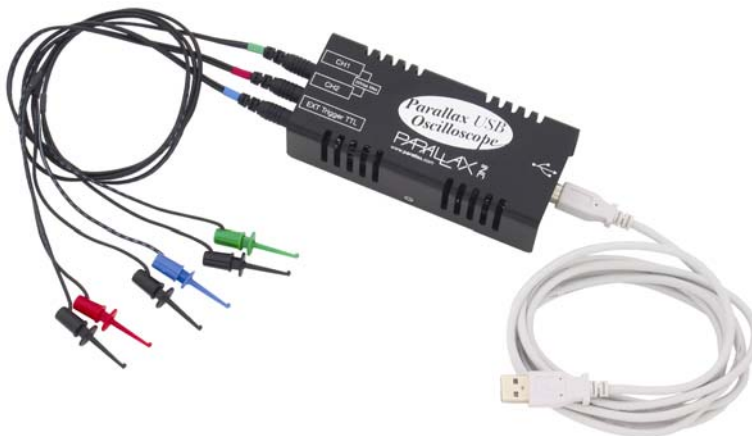


## Parallax USB Oscilloscope (#28014)

### Digital Real-time and Storage Oscilloscope

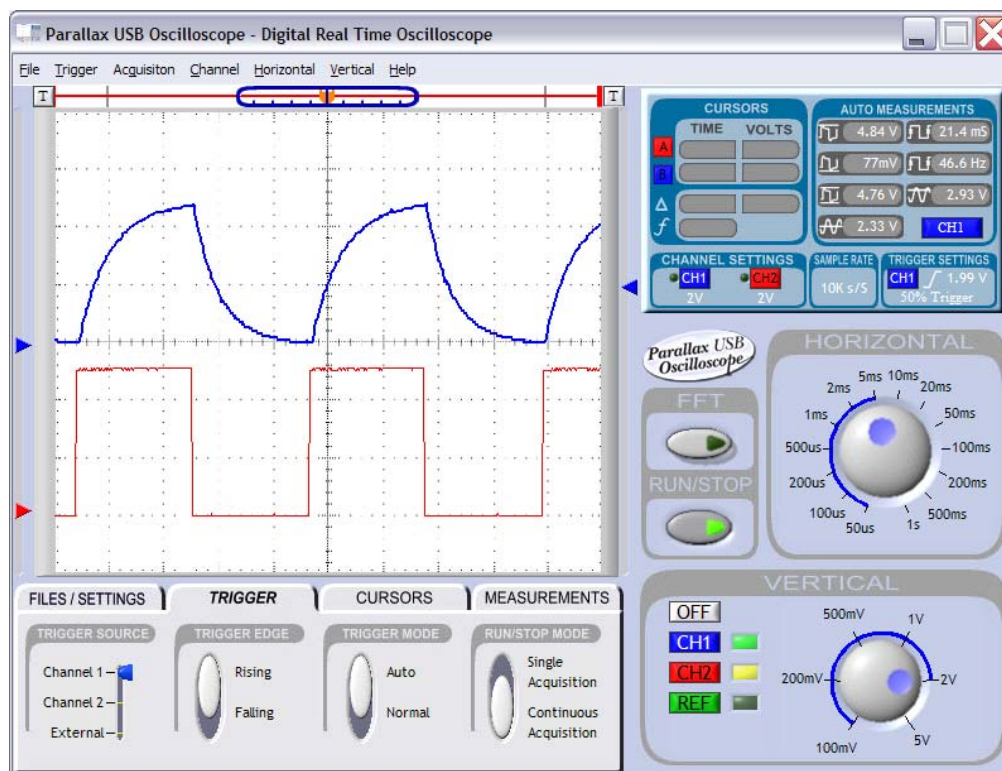
#### Kit Contents

- Parallax USB Oscilloscope
- 3 sets of 1X probes
- 1 USB cable
- Parallax CD-ROM (not shown)



#### General Information

The Parallax USB Oscilloscope (formerly OPTAscope) is a digital real-time storage oscilloscope that connects to your PC via USB. The small, portable hardware package uses a high-speed USB cable for both data and power, so it requires no separate power supply. All oscilloscope controls are managed through a point-and-click PC software interface. This low-cost and easy-to-use oscilloscope is a perfect solution for students and hobbyists who need to measure and interpret signals for their projects.



## **The *Understanding Signals* Student Guide**

For a detailed introduction to using the Parallax USB oscilloscope, we recommend the *Understanding Signals* Student Guide by Doug Pientak of Parallax Inc. Each activity includes a BASIC Stamp<sup>®</sup>-controlled example circuit and code, directions for configuring the oscilloscope and placing the probes, and screen-captures of the Parallax USB Software interface displaying the signal. *Understanding Signals* is included as a pdf on the Parallax CD under Documentation → Educational Curriculum → Understanding Signals v1.0. You may purchase a printed copy (part #70009) or download the latest version from [www.parallax.com](http://www.parallax.com). (*Understanding Signals v1.0* was written when this oscilloscope was sold under the name OPTAscope, but all the experiments in the text are valid for the Parallax USB Oscilloscope.)

### **Specifications:**

- 2 Channels – view 2 signals at once
- 1 million samples per second maximum sample rate with one channel
- 500, 000 samples per second sample rate with 2 channels
- View sine waves up to 60 kHz
- View square waves up to 100 kHz
- 4 FFT functions: Black-Harris, Hamming, Rectangular, Hanning
- 20 Vpp maximum input for channel 1 and channel 2
- 200 kHz bandwidth
- 8-Bit vertical resolution
- External trigger source: TTL rising edge, 5 V TTL maximum input
- Trigger on rising or falling edge at any voltage
- Variable trigger voltage on channels 1 and 2
- Horizontal trigger position settings at 10%, 50%, and 90%.
- Auto and normal trigger modes
- Vertical, horizontal, and paired cursor functions
- Zoom feature with active cursors
- Built-in screen-capture bitmap function
- 1X probes included
- USB 1.1 for data and power supply – no other power supply needed.
- Size: 5" x 2.25" x 1.5" (excluding cable and probes)
- Weight: 8 ounces

### **System Requirements**

Minimum\*\* configuration:

- Windows<sup>®</sup> 98 or higher operating system\*
- Pentium<sup>®</sup> 233 MHz processor
- 32 MB of RAM
- At least 15 MB of free disk space
- Graphics card able to display an 800 X 600 resolution at 16-bit color depth.
- HTML Viewer
- Mouse or similar pointing device

Recommended\*\* configuration:

- Windows XP
- Pentium II 450 MHz processor
- 64 MB of RAM
- 20 MB free disk space
- Graphics card able to display a 1024 X 798 or higher resolution at 32-bit color depth.
- HTML Viewer
- Mouse or similar pointing device

\*Windows 95 and NT are not supported, Windows XP is recommended.

\*\* Performance is based on CPU speed.

## **Software and Hardware Installation with Internet Access**

**NOTE: These instructions replace those found in the README files.**

1. We recommend downloading the latest version of the software (free) from [http://www.parallax.com/html\\_pages/downloads/software/scope.asp](http://www.parallax.com/html_pages/downloads/software/scope.asp). However, you may install the software from the Parallax CD as noted in steps 1-3 in the section below, then return to these instructions. NOTE: setup\_v4.0.exe (included on the October 2004 Parallax CD) does not contain help files. Check the web page listed above for Help files with separate installation instructions.
2. Install the software by following the Install Wizard directions. Ignore the README files.
3. Connect the Parallax USB Oscilloscope hardware to your computer's USB port. NOTE: You will get the best results if your Parallax USB Oscilloscope is the only device connected to the root, because this device is powered from the USB port. If you need to have other devices connected that are also powered from the same USB port, we recommend you purchase a powered USB hub.
4. If the **Found New Hardware Wizard** window pops up, you will be asked "Can Windows connect to Windows Update to search for software?" Click on **"Yes, this time only"** then continue to follow the prompts until installation is complete.
5. Go to the **Running the Software for the First Time** section on page 4.

## **Software and Hardware Installation without Internet Access**

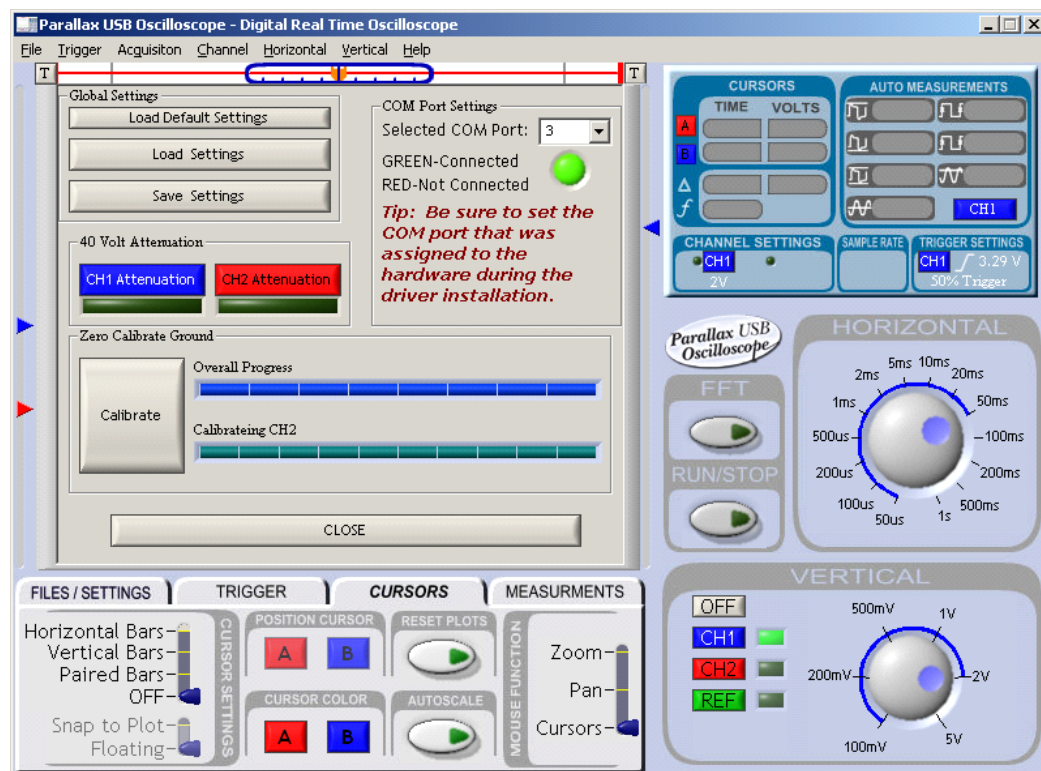
**NOTE: These instructions replace those found in the README files.** Also note: the Parallax USB Oscilloscope setup\_v4.0.exe (included on the October 2004 Parallax CD) does not contain help files. Check the web page [http://www.parallax.com/html\\_pages/downloads/software/scope.asp](http://www.parallax.com/html_pages/downloads/software/scope.asp) above for Help files with separate installation instructions.

1. Insert the Parallax CD into your CD drive.
2. From the Welcome screen, click on **Software**, select the **Parallax USB Oscilloscope** folder, then click on the **Parallax USB Oscilloscope** diskette icon. Note: if the Welcome screen does not launch, browse to the CD drive, and select
3. Install the software by following the Install Wizard prompts. Ignore the README files.
4. Connect the Parallax USB Oscilloscope hardware to your computer's USB port. NOTE: You will get the best results if your Parallax USB Oscilloscope is the only device connected to the root, because this device is powered from the USB port. If you need to have other devices connected that are also powered from the same USB port, we recommend you purchase a powered USB hub.
5. When the **Found New Hardware Wizard** window pops up, you will be asked "Can Windows connect to Windows Update to search for software?" Click on **"No, not this time"** then continue.
6. Click on **"Install from a list or specific location (Advanced)"**
7. Select **"Search for the best driver in these locations."**
8. Also select **"Include this location in the search:"**
9. Click on **"Browse"**.
10. Locate **C:\Program Files\Parallax\USB Oscilloscope\Driver**. Note: These files were placed in this location using the default software installation. If you selected another location during the software installation, you will need to browse to that location to find this folder.
11. Click on **"Next"**.
12. A Hardware Installation warning window will appear. Click on **"Continue Anyway"**.
13. **"Completing the Found New Hardware Wizard"** should appear. Click **"Finish"**.
14. **Since this device requires two separate drivers, after a brief pause the Found New Hardware Wizard will open again. Or, you may get an error message asking for an additional FTDI file. You must repeat the process from step 6 to complete the driver installation.**
15. Go to the **Running the Software for the First Time** section on page 4.

## Running the Software for the First Time

**NOTE:** These instructions replace those found in the README files.

1. In your computer's **Device Manager**, look under **Ports (Com& LPT)** and note the number assigned to the new USB serial port.
2. Run the Parallax USB Oscilloscope software from the desktop icon, or from **Start → Parallax USB Oscilloscope → USB Oscilloscope 4.0.0**.
3. Click anywhere on the software identification window to open the interface.
4. From the menu bar, select **File → Set COM Port** to open the window shown below.



5. In the **Selected COM Port** field, enter the COM port number that you identified as the new USB serial port. When the correct COM port number is entered, the dot indicator below the field will turn from red to green.
6. If you wish, follow the prompts to calibrate your probes.
7. Your Parallax USB Oscilloscope is ready to use!

## Safe Oscilloscope Use

Before test-driving your Parallax USB Oscilloscope, it is important for you to be aware of the general safety guidelines for working with oscilloscopes. Working with oscilloscopes requires you to work on circuits with live voltage. It is your responsibility to learn the following safety guidelines and practice them faithfully while working with live circuits. Failing to do so can result in equipment damage, and severe personal injury or death. Below you will find a list of safety rules that you are to use as a guideline while working with live circuits and the Parallax USB Oscilloscope.

- Remove metallic jewelry and watches before starting.
- Make sure your hands are clean and dry while working with any oscilloscope.
- Work upon an anti-stat pad that is properly grounded.
- Keep your work area free from food and beverages.
- Do not attempt to measure any voltage that could be 20 Vpp or higher.
- If anything you are working on gets hot or smokes, turn it off immediately.
- ALWAYS disconnect the power supply to the circuit you are measuring before walking away from your workstation.