



DataRay Inc. User Guide

WinCamD Multiple Camera Setup & Use

Beam Profiling ... Engineered as a system
... Delivered as a Solution

Applies to: Software Ver. 6.00R10e or higher, running under Windows XP with SP2 or higher or Windows Vista.

Short of time? Save yourself time by carefully following through this User Guide the first time that you use the equipment. Once you have done it properly once, the next time will be simple and fast.

Applications

- Up to eight WinCamD cameras connected to a single computer
- CW and pulsed modes, including triggered simultaneous capture by multiple cameras.

1) Understand DataRay software

First learn to setup and measure everything that you want to measure on your particular beams with a single camera. [You may even need to read the manual!] As a *minimum* you will need to do the following:

- **CW beams.** Take the exposure off **auto** (necessary for multi-camera use) and set appropriate attenuation/sampling and exposure time. Set **Capture Block** and **Resolution**.
- **Pulsed lasers.** Set the attenuation/sampling/gain, the triggering, the trigger polarity if an external trigger, the min and max **Input Response Limits in percent**. Set **Capture Block** and **Resolution**. Set the **Exposure time** to approximately twice the pulse width.

2) Understand Windows USB 2.0 Issues

- **Operating systems.** We support Windows XP and Vista. We do not support Windows 2000 because it inadequately supports USB 2.0. We recommend 1 GB of RAM for multiple camera use. If you only have 512 kB, since RAM is inexpensive, we recommend that you upgrade to ≥ 1 GB.
- **USB 2.0.** You *must* have USB 2.0 ports. Unsure? See the App. Note at the website. <http://www.dataray.com/pdf/USB%202.0%20Products%20Software%20&%20Hardware%20Compatibility.pdf>
- **Drivers.** Windows treats USB ports individually, not collectively, (just as it does PCI card slots). The camera driver *must* be installed on every USB port which you are going to use. When you plug a WinCamD-UXXX camera into a USB port for the first time, the **New Hardware Found** wizard will appear and must be followed.
- **Camera numbering.** Windows *may* be inconsistent about the order in which it numbers the ports on your PC when you restart your PC. E.g., you have carefully worked out which camera appears as Camera #1 in the DataRay software, which is Camera #2, etc, and labeled them accordingly. When you restart your computer, Windows *may* (apparently arbitrarily) decide to number the ports differently and your camera numbering must be checked and *may* need to be changed.

Option: We have found that using a powered USB 2.0 four port hub to connect four cameras to a single USB 2.0 port on a laptop, does lead to consistent camera numbering between reboots. (We used a Belkin F5U218-MOB Thumb Hub). The same may be true when using a PCI card to USB 2.0 multi-port hub, but we have no experience of this.

3) Connect and Set Up the Individual Cameras

- a) Connect the first camera. If a new installation, install the driver. [For WinCamD-UCM cameras only, you will need to run through the calibration routine (see User Manual). The calibration file will be held in the **c:\Program Files\DataRay** directory on the PC.]

Set up the camera up on your beam, see 1) above.

Label this as camera #1.

- b) Repeat a) for the other cameras and number them accordingly. As you connect additional cameras, in order to set it up you will need to select the new camera in the **Camera** pull-down menu.
- c) If you are using an external trigger, each camera must be simultaneously triggered via its BNC. Simply triggering one of the cameras will *not* do it.

- d) Once you have each camera behaving individually as you require, go into the **Camera** pull-down menu and check it as shown right. You need **Auto select camera** and **Use all USB cameras** to be checked.

CamD 0 of 0 Filter=0.2% Wl=660

Camera View Centroid Setup

- Auto select camera 'default' [ALT 0]
- Camera 1 [ALT 1]
- Camera 2 [ALT 2]
- Camera 3 [ALT 3]
- Camera 4 [ALT 4]
- Camera 5 [ALT 5]
- Camera 6 [ALT 6]
- Camera 7 [ALT 7]
- Camera 8 [ALT 8]

- USB Camera 1 [SHIFT 1]
- USB Camera 2 [SHIFT 2]
- USB Camera 3 [SHIFT 3]
- USB Camera 4 [SHIFT 4]
- USB Camera 5 [SHIFT 5]
- USB Camera 6 [SHIFT 6]
- USB Camera 7 [SHIFT 7]
- USB Camera 8 [SHIFT 8]

Use all USB cameras

CamD 0 of 0 Filter=0.2% Wl=660

Camera View Centroid Setup

- Auto select camera 'default' [ALT 0]
- Camera 1 [ALT 1]
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- Camera 6 [ALT 6]
- Camera 7 [ALT 7]
- Camera 8 [ALT 8]

- USB Camera 1 [SHIFT 1]
- USB Camera 2 [SHIFT 2]
- USB Camera 3 [SHIFT 3]
- USB Camera 4 [SHIFT 4]
- USB Camera 5 [SHIFT 5]
- USB Camera 6 [SHIFT 6]
- USB Camera 7 [SHIFT 7]
- USB Camera 8 [SHIFT 8]

Use all USB cameras

- e) Press **Go**. The software will cycle through the cameras. If multiple cameras receive a common external trigger, then the cameras will take measurements simultaneously.

v6.00R10e: Live = WinCamD 0 of 0 Filter=0.2% Wl=660.0nm, Pixels=13.40:13.40, Image = 1024 by 1024, Fast UsbCam=3

The buffer counter in the top blue line – red box above – will count up in groups of **n** where **n** is the number of cameras connected.

Due to PC processor and video card speed, depending on the update rate the PC may or may not catch up during live operation. It will go faster if you right click the 3D area and uncheck **3D enabled**. However, rest assured, the image files are being saved in the buffer.

- f) Press **Stop** to see the images in the buffer, accessed by the left/right arrows in the tool bar and the **PgUp/PgDn** keys on the keyboard. The buffer count will count and the Camera # is shown in the right hand side of the top blue line – green box above. e.g., **UsbCam=3**. [Warning. The

camera number may 'fall off' the right hand side of the top blue line if your screen is 1024x 768 or less. We are looking to change this in the future.]

- g) Save the data buffer. Press **File, Save, SAVE ALL data in data buffer as wcf**. You may give it your own choice of name, or if you are always working on the same system, consider using **Enable auto-naming** found in the **Setup** pull-down menu to time and date the name automatically. Beware: if you are saving a full buffer of 64 full resolution images, you can be looking at a 120 MB file. Such files may quickly fill your hard drive if you take a lot of them.

4) Known bugs?

We occasionally notice that when you press **Go** the first time, the system does not see all the cameras. Pressing **Stop** and then **Go** again normally resolves this.

5) Problems?

First reread this User Guide. If that does not help, carefully define the problem, save as a **wcf** file a sequence of at least **2n** images from the buffer (where **n** is the number of cameras). Email the problem description and the file sequence to support@dataray.com, and then call 303-543-8235 to follow-up your email.