iVision-HB2 捶击式布氏测量用户手册
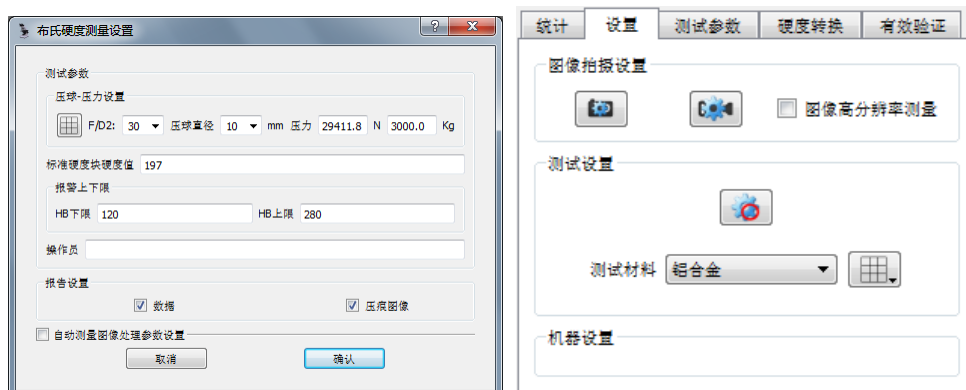
iVision-HB2 捶击式布氏测量采用德国工业标准 DIN.1605，其硬度值获得不是通过测量压痕大小与已知压力直接计算，而是通过分别测量标准试块和试件压痕大小（压力产生于捶击，相等但不需要知道），根据不同材料，查表并插值计算获得. iVision-HB2 使用上大体和 iVision-HB 传统布氏测量一样(见附录)，有如下注意事项：

1. **标定：** 使用前和 iVision-HB 传统布氏测量一样标定摄像头

2. **设置：** 在布氏硬度测量设置对话框中输入标准硬度块硬度值，并且选择压球直径. 在主介面的设置栏测试材料项里选择测试材料. 注：测试材料选项最后一项"用 HB 计算公式"是用来作参考用.

3. **测量：** 捶击样品后,先测量标准块压痕大小 (自动或手动)，压痕直径 Ds 会显示出来. 然后测量试样压痕大小. 试样压痕大小 Ds 测量出来后，系统通过查表与插补计算自动获得试样硬度 HB 值. 注：按摄像头按钮或按键盘空格键会切换启动自动测量与视频。

4. **手动修改：** 和 iVision-HB 传统布氏测量一样,鼠标拖拉标记压痕的圆圈,测量结果将自动更新. 可以随时双击相册里已经测量好的压痕放到主图像上修改.

附录：iVision-HB 布氏硬度压痕自动测量系统用户手册简要

1. **安装 iVision-HB：** 在 PC 机(32 位 Windows XP 或 Windows 7 系统)上，插入 iVision-HB 软件安装光盘，双击运行安装文件 **iVision_v1.0.0_WIN32_XP_TZ00xxxx_installer.exe**，回答系统的一些提问后，程序和摄像头驱动就应当安装好了。

2. **打开 iVision-HB：** PC 机插入 USB 加密狗和 USB 手持摄像头，当摄像头第一次插入一 USB 端口时，如系统是 Windows XP，系统会弹出安装驱动窗口，选择自动安装。如系统是 Windows 7,系统则会自动安装驱动但或许会需要一两分钟。驱动安装完毕后，可按摄像头上按钮启动或用鼠标在界面上双击启动程序 iVision。

3. **设置用户界面：** 第一次使用或重置时,选择菜单**布氏硬度->HB 测量**,这时程序显示 iVision-HB 主界面. 用户可用鼠标拖拉程序主窗口,窗口里的分块,表格栏等到适合的大小。

4. **选择摄像头：** 第一次使用或重置时，选择菜单**图像拍摄->打开图像拍摄窗口**. 在弹出的摄像窗口里点击菜单**设备**,选择摄像头 **Digital microscope** 或其它 iVision-HB 支持的摄像头. 关闭摄像窗口. 在主界面右上角处点击按钮**视频采集**▮◀ 启动摄像。 这是视频应该出现。如果需要点击菜单**图像拍摄->摄像头设置**,调整摄像头参数。注意摄像头 USB 连接线上的光源亮度调节旋钮需要打开。

5. **设置测量参数:** 在主界面右下角处，选择**设置->测试设置**，弹出**布氏硬度测量设置**窗口。如需选择样品测试压力，选择 **F/D2** 和**压球直径**，测试**压力**将自动计算得出。对系统提供的 USB 手持摄像头，**自动测量方法**应选择默认方法**亮度**。如本系统软件用在硬度计机器上，则由于硬度计机器上光源系统不同，如压痕和样品背景亮度对比度小，这时**自动测量方法**会需要选择**边缘**。

6. **系统标定:** 第一次使用时或标定卸载后,摄像头需要经过标定才能用来测量。可以用标准布氏硬度块或标定尺进行标定。如使用标准布氏硬度块标定，设置测试压力，移动摄像头使压痕在视频中央部位。按键盘空格键，或摄像头按钮，或点击**自动测量**⌀按钮启动压痕自动测量。如系统自动测量未能测出，点击**手动测量**🖐按钮实现手动测量，在压痕图像上点击拖拉鼠标从压痕直径一端拖拉到另一端，使系统产生的圆与实际压痕对齐，然后松开鼠标。在系统弹出的对话框中输入标准硬度块的硬度值后,系统就标定好了可以用来测量了．如果需要重新标定,选择菜单**标定->标定浏览**,输入设定的密码或直接点击确定（如果没有设置密码）,在弹出的标定浏览对话框中点击按钮**卸载标定**,关闭标定浏览窗口,这时系统进入未标定状态。照如上所述进行重新标定。

7. **测量:** 如视频处于静态（如测量后），按键盘空格键，或摄像头按钮，或点击**视频采集**🎥按钮启动视频。移动摄像头或样品使压痕在视频中央部位,按如上所述自动或手动测量。

8. **修正:** 测量完后，如果图像上压痕圆周标记与实际压痕不符，点击压痕圆周标记，鼠标拖动使压痕标记与实际压痕相符。该压痕测量值与统计结果等会自动更新。

9. **删除:** 如需要删除单个测量，在 HB 测量结果表中点击纵向表头选择要删除的行，或在相册中点击选择要删除的压痕，点击删除❌按钮。

10. **产生报表:** 点击**产生报告**🔲按钮产生 WORD 格式测试报表。报表如不需要压痕图像或数据,可在**布氏硬度测量设置**窗口中的**报告设置**中设置。如报告模板需要定制,可联系系统提供商。

11. **新样品:** 点击新样品📄按钮清除上一样品测量结果。

iVision-HB2 (DIN.1605) User's Manual Addition

iVision-HB2 measures the Brinell hardness automatically according to the German Industrial Standard DIN.1605. Instead of calculating the HB directly from the known indentation force and the indentation diameter in the traditional Brinell hardness HB measurement, DIN.1605 measures the diameters of both of the indentations on the standard sample and the test sample (which are produced through identical indentation force), and then calculate the HB value of the test sample through material specific lookup table and interpolation.　The usage of iVision-HB2 is basically the same as that of the classical iVision-HB (see appendix), with the below notes:

1. **Calibration:** Calibrate the camera the same way as iVision-HB.
2. **Settings:** Enter the Standardized Sample HB Value and select the indentation ball diameter in the HB Measurement Settings dialog. Select the Test material in the Settings tab in the main window.
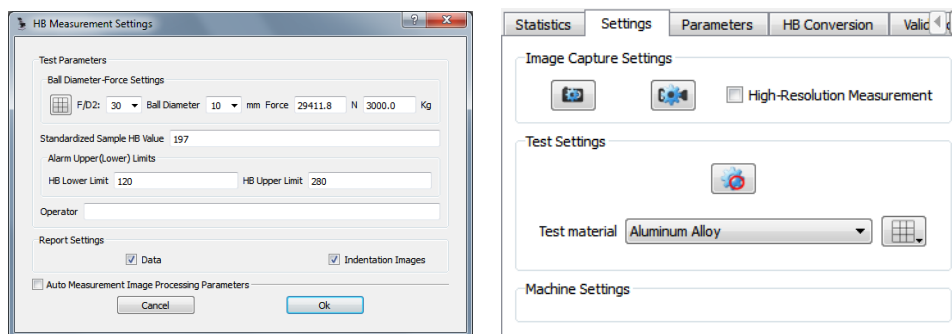
3. **Measure:**　After sample testing, first measure the indentation on the standardized sample (automatic or manual). Its diameter Ds will show on the result table. Then measure the indentation on the test sample. Its diameter Dt will show and the system automatically calculates the sample HB according to the lookup table of the test material and by interpolation. Note that press the camera button or the space key will toggle starting the auto-measure and the camera preview.
4. **Correction:** Like in the iVision-HB, mouse press and drag the indentation circle to correct and the system automatically update the measurement results.　If necessary, double click on the already measured image in the album to bring the measurement image to the main image pad to correct.

Appendix: iVision-HB Automatic Brinell Hardness Indentation Measurement, Brief User's Manual

1. **Install iVision-HB:** On PC with 32bit Windows 7 or Windows Xp system, double click the installer file **iVision_v1.0.0_WIN32_XP_TZ00xxxx_installer.exe** on the installation CD, answer the prompts by the system, the application and the driver of the USB camera should be installed.
2. **Open iVision-HB:** Insert the USB license key in PC and plug in the USB camera. Note when the USB camera is first plugged in an USB port, the Windows XP system will prompt the user to installer the driver.　Simply select the automatic installation option.　After the drives is installed, push the camera button to start the application or just start the application from

the desktop.

3. **Set main user interface:** For the first time use, open the HB measurement main user interface by selecting menu HB->HB measurement. Use mouse dragging to resize the main window, the splitter panes, and the table column widths etc to user's preference.

4. **Select camera:** For first time use, select camera by selecting menu Capture->Open image capture window. Go to menu Device and select camera Digital microscope or another camera supported by iVision-HB. Close the Media Capture window. Click on the ▣◀ button in upper right of the main window to start the camera. If necessary go to menu **Capture->Camera settings** to adjust the camera parameters. Note that the light adjustment knob on the USB cable should not be turned off completely.

5. **Set measurement parameter(s):** At the right bottom of the main window, click on button **Settings -> Test Settings** to invoke the HB Measurement Settings dialog. To set the indentation force for the test sample, select F/D2 and the indentation ball diameter, the test force will be calculated automatically. For the as provided hand held USB camera, the **Auto-measure method** should be set to the default **Brightness**. If the software of the system is used on the Brinell hardness test machine, if the brightness of the indentation and the sample background is small, then the **Auto-measure method** should be set to **Edge**.

6. **Calibrate:** At first time use or after calibration is unloaded as described below, the system needs to be calibrated to measure. A standard Brinell hardness test sample or a calibration ruler can be used to calibrate the system. To use the standard test sample, set the test force as described above. To start automatic measurement, push the camera button, or press the Space key on the keyboard, or click the **Auto Measure** ⌀ button. If system can not find the indentation automatically, click on the **Manual Measure** 🖰 button, then mouse press on one end of the indentation edge and drag to the other end. Release the mouse after the best alignment of the circle with the indentation edge. Enter the known HB value of the sample at the prompt, the system should be calibrated. To re-calibrate the system, it is necessary to unload the calibration. To do so, select menu **Calibration->Calibration viewer**, enter password if set or click OK to pass, click **Unload** button and close the viewer, the system should be at un-calibrated state. Do calibration as described above.

7. **Measure:** If the camera is still (e.g, after a measurement), push the camera button, or press the Space key on the keyboard, or click on the **Video Preview** button to start camera preview. Move the camera or the sample to make the indentation appear in the middle of the preview. Make the measurement as described above.

8. **Correct the measurement:** If correction of measurement is needed, mouse press and drag the label circle to align it with the indentation edge, and release. Measurement value and statistics etc will update automatically.

9. **Report:** Click on the **Generate Report** 📄 button to generate report in Word format. User may opt not to report the indentation images or the data by checking the Report Settings on the HB measurement settings dialog.

10. **Start a new sample:** Click on the New Sample ▯ button to clear the measurement results to start the measurement on a new sample.