Applications Note

Using Keithley ACS with a Pegasus™ Prober

Wentworth Laboratories

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This document briefly describes how to connect a Wentworth Laboratories Pegasus™ prober to Keithley's Automated Characterization Suite (ACS) software. This connection can either be direct, or through a PC running LabMaster. Versions 5.2 and 5.2.1 of the ACS software are covered (all the screen shots in this document are from version 5.2 of this software).

ACS is a flexible, interactive software test environment designed for semiconductor device characterization, reliability test, parametric test, and component functional test.

Notes:

1. This document is intended to supplement the Pegasus™ prober's user manual and should be read with that manual.
2. If LabMaster™ is being used, then this document is intended to supplement the LabMaster user manual and should be read with that manual.
3. This document assumes a basic knowledge of the ACS software and should be read with ACS documentation.

Contents

1. Pegasus™ Prober Set-Up (Direct Connection Only)

If your system has a PC running LabMaster™, please skip this section.

> ⚠️ The **Pegasus™** prober must have the optional GPIB functionality installed. If not, please contact Wentworth Laboratories for a quote to upgrade your system.

On the Pegasus prober select the **Settings** option, and then select the **Remote Settings** item. This will display the **Remote Settings** menu. From this menu, set the following item:

- Set the **Remote Interface** item to be **GPIB**.

Now select the **GPIB Settings** item to display that menu. From this menu, set the following items:

- Set the **Device** parameter to be **DEV3**. If there is another piece of equipment attached to the GPIB bus with the address of **DEV3**, set a different address.
- Set the **Mode** parameter to be **INF**.
- Set the **EOT Character** parameter to be **10**.

> ⚠️ The Keithley ACS parameter (below) was added to the **Pegasus™** prober in firmware version 7.3.5, which was released in April 2015. If you are currently using an earlier version of firmware, please contact Wentworth Laboratories.

Leave this menu by pressing the escape button, and then select the **Compatibility Settings** item to display that menu. On this menu set the following item:

- Set the **Keithley ACS** parameter to be **Enabled**.

Press the home button to exit the menu (on older systems, press the escape button three times to exit the menu).

Select the **Remote** option to enter remote mode (which allows the ACS software to control the Pegasus™).

2. LabMaster Set-up (PC Connection Only)

If your system does not have a PC running LabMaster, please skip this section.

> ⚠️ The PC must have an optional National Instruments GPIB board fitted. If not, please contact Wentworth Laboratories for a quote to upgrade your system.
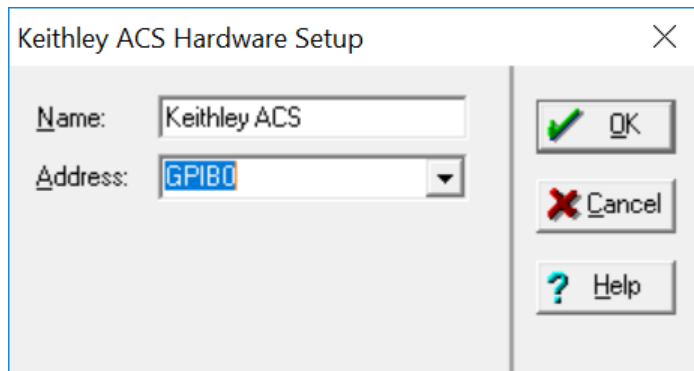
Press the Hardware Setup button 🔧 on the Device Toolbox (or use the Shift+F9 keyboard shortcut) to display the **Hardware Setup** dialog box:
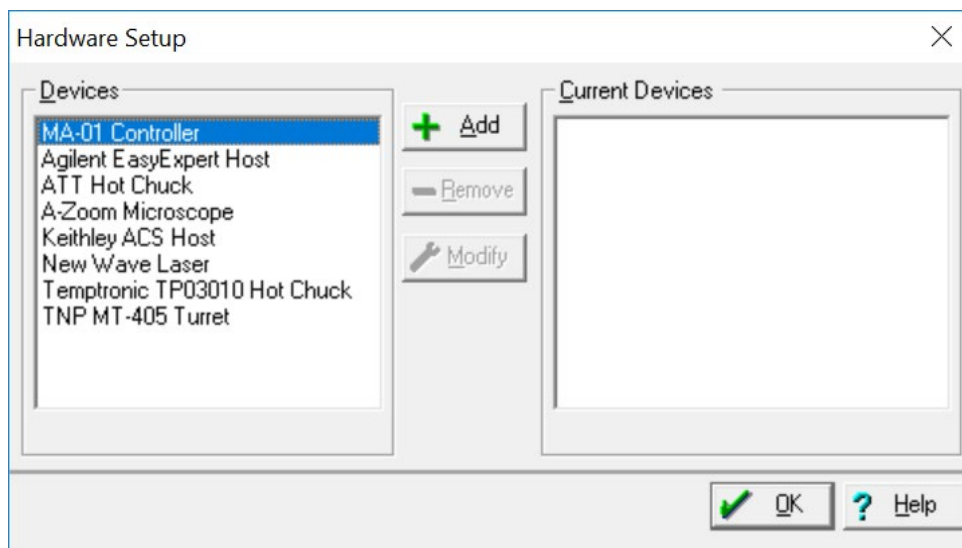
If a **MA-01 Controller** is not in the list of **Current Devices**, select it on the **Devices** list and then press the **Add** button to display the **MA-01 Controller Hardware Setup** dialog box. Enter the correct RS232 **Address** for this device and then press the **OK** button to close this dialog box, initialise the hardware, and add one or more buttons to the Device Toolbox:
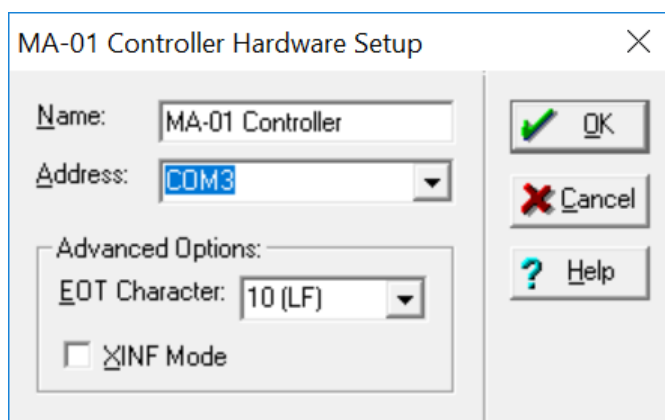
If a **Keithley ACS Host** is not in the list of **Current Devices**, select it on the **Devices** list and then press the **Add** button to display the **Keithley ACS Hardware Setup** dialog box. Enter the correctly GPIB board **Address** for this device and then press the **OK** button to close this dialog box, initialise hardware, and add the Remote Host button to the Device Toolbox:

Press the **OK** button on the **Hardware Setup** dialog box to close this dialog box.

Finally press the Remote Host button ![icon] on the Device Toolbox to start communicating with Keithley ACS.

⚠	This button will be disabled if the **Pegasus™** prober is fitted with a door lock and if the door is currently unlocked. In this case, lock the door using the Door Lock button on the Device Toolbox to re-enable the Remote Host button.

⚠	Full Keithley ACS support was added to the **LabMaster™** software in version 12.0.5, which was released in February 2016. If you are currently using an earlier version of software, please contact Wentworth Laboratories.

3. ACS Prober Set-up

From the **Tools** pull-down menu, select the **Configure Hardware** item. This will display the **KI System Configuration** options:
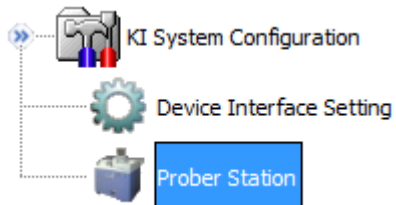
Select **Prober Station** to display the **Prober Properties**. Select **Wentworth Pegasus™ S300 Prober with SRQ check** in the **Model** field, the GPIB device number you set on the Pegasus™ in the **GPIB Address** field:
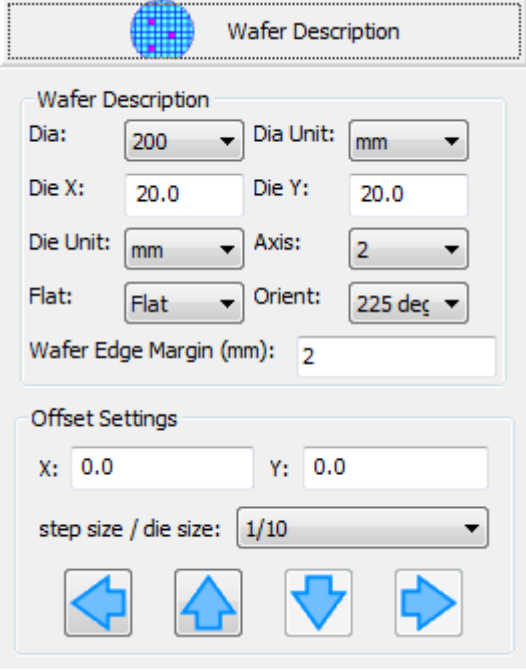

⚠	Please check prober manual on how to correctly set-up the prober to operate within ACS.

4.   ACS Wafer Map Set-up

Select the **Wafer Description** option:

Set the **Axis** field to be 2.

On the wafer map, right-click on the left most die on the bottom row and select **Set As Target** from the pop-up menu. Right-click on the die again and select **Set As Reference**.

5. ACS Prober Control

Select the **Prober Control** option:
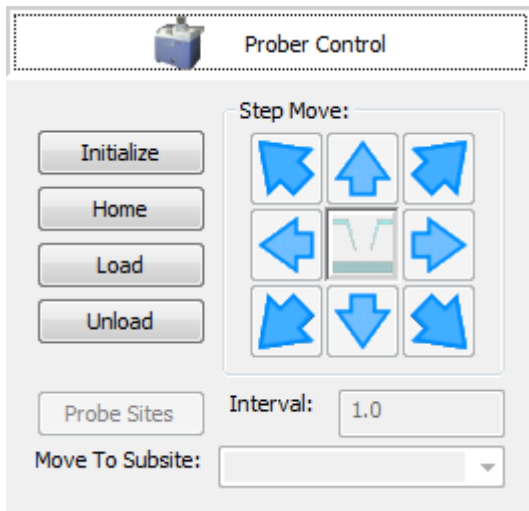
First you must initialise the prober by pressing the **Initialize** button. If the prober has just been powered up and has not yet been referenced, it will now be referenced.

The **Load** button will prompt you to load and align a wafer, and the **Unload** button will unload a wafer (a wafer must be placed on the chuck before the **Load** button is pressed).

The **Home** and arrow buttons will move the wafer under the probe needles, and the contact button will raise the chuck to contact the current die or lower the chuck from the die.

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