Application Note

Controlling a Wentworth Labs Prober from a Keysight B1500A tester running EasyExpert

Wentworth Laboratories

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The Keysight B1500A tester has an in-built Windows PC running a control application called EasyExpert. Drivers can be written that allow EasyExpert to control semi-automatic probers such as the Wentworth Pegasus™ series. These drivers consist of three programs, one to load and align a wafer, one to step to the next die on the wafer and the last to unload the wafer. This document describes how to configure the systems and use these drivers.

This document covers the basics of setting up and using the Wentworth Labs EasyExpert driver.

Notes:

- The word *Prober* will be used to refer to any supported Wentworth Labs prober: either a LabMaster™ FA R&D system, a LabMaster™ Pro production system, or a standalone Pegasus™ prober.

- The word *Tester* will be used to refer to a Keysight B1500A tester running EasyExpert, or any other compatible Keysight product.

- The word *Driver* will be used to refer to Wentworth Labs EasyExpert driver.

- This document is intended to supplement the relevant prober and tester user manuals, and should be read with these manuals.
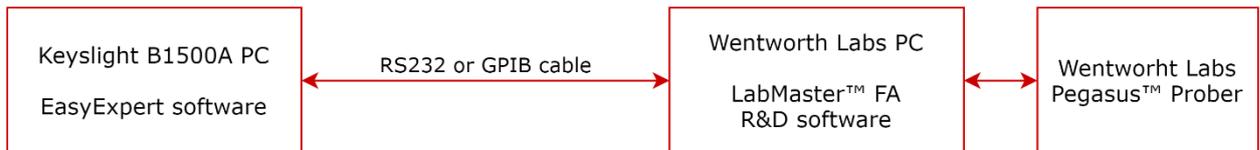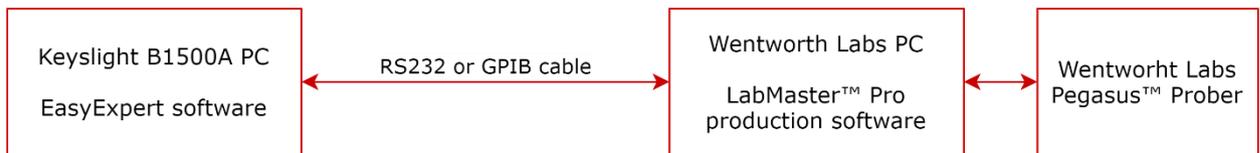
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1. System Requirements

The Keysight tester has a GPIB interface that can be used to communicate directly to the Wentworth Labs prober. Alternatively, if an external USB to RS232 adapter is used, the tester can control the prober directly via this. For specialist applications, LabMaster™ FA can be installed on the tester and EasyExpert can communicate with it via DDE protocol.
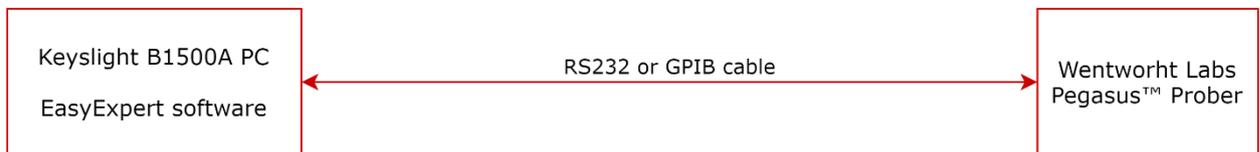
Hardware Configuration #1 (LabMaster™ FA R&D System)

| Keyslight B1500A PC
EasyExpert software | ← RS232 or GPIB cable → | Wentworth Labs PC
LabMaster™ FA
R&D software | ↔ | Wentworht Labs
Pegasus™ Prober |

Hardware Configuration #2 (LabMaster™ Pro Production System)

| Keyslight B1500A PC
EasyExpert software | ← RS232 or GPIB cable → | Wentworth Labs PC
LabMaster™ Pro
production software | ↔ | Wentworht Labs
Pegasus™ Prober |

Hardware Configuration #3 (Standalone Pegasus™ Prober)

| Keyslight B1500A PC
EasyExpert software | ← RS232 or GPIB cable → | Wentworht Labs
Pegasus™ Prober |

Hardware Configuration #4 (LabMaster™ FA hosted on the Keysight PC)

| Keyslight B1500A PC
Both EasyExpert and LabMaster™ FA software | ← RS232 cable → | Wentworht Labs
Pegasus™ Prober |

2. Installation

The EasyExpert driver is installed on the tester from the supplied installation media. Insert the media in the tester, use Windows Explorer to run *Setup.exe*, and then follow the on-screen instructions.

On the *Hardware Type* page, you will need to select the type of prober and the type of connection between the prober and the tester:
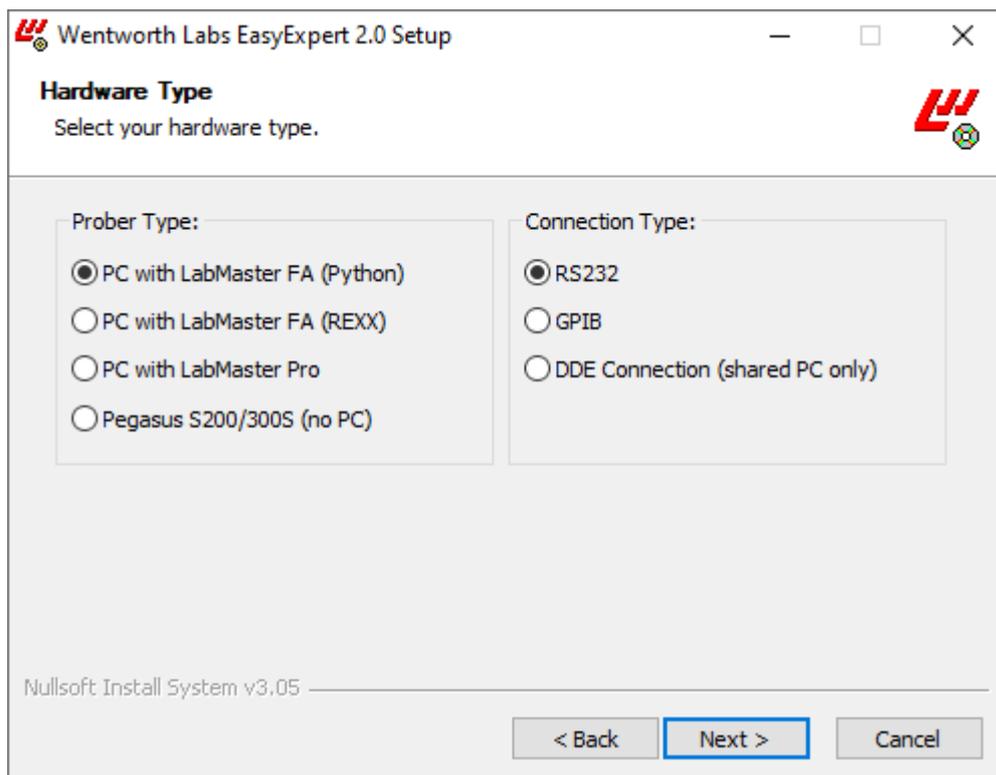

- For Hardware Configuration #1 (see the System Requirements diagram), you should select *PC with LabMaster FA* and either *RS232* or *GPIB* as appropriate.

- For Hardware Configuration #2, you should select *PC with LabMaster Pro* and either *RS232* or *GPIB* as appropriate.

- For Hardware Configuration #3, you should select *Pegasus S200/300S* and either *RS232* or *GPIB* as appropriate.

- For Hardware Configuration #4, you should select *PC with LabMaster FA* and *DDE Connection*.

If an RS232 connection type is selected the *RS232 Connection* page be displayed when you press *Next>*. You should select the RS232 port number of the USB to RS232 adapter on the tester (eg, for COM5 you would select 5):
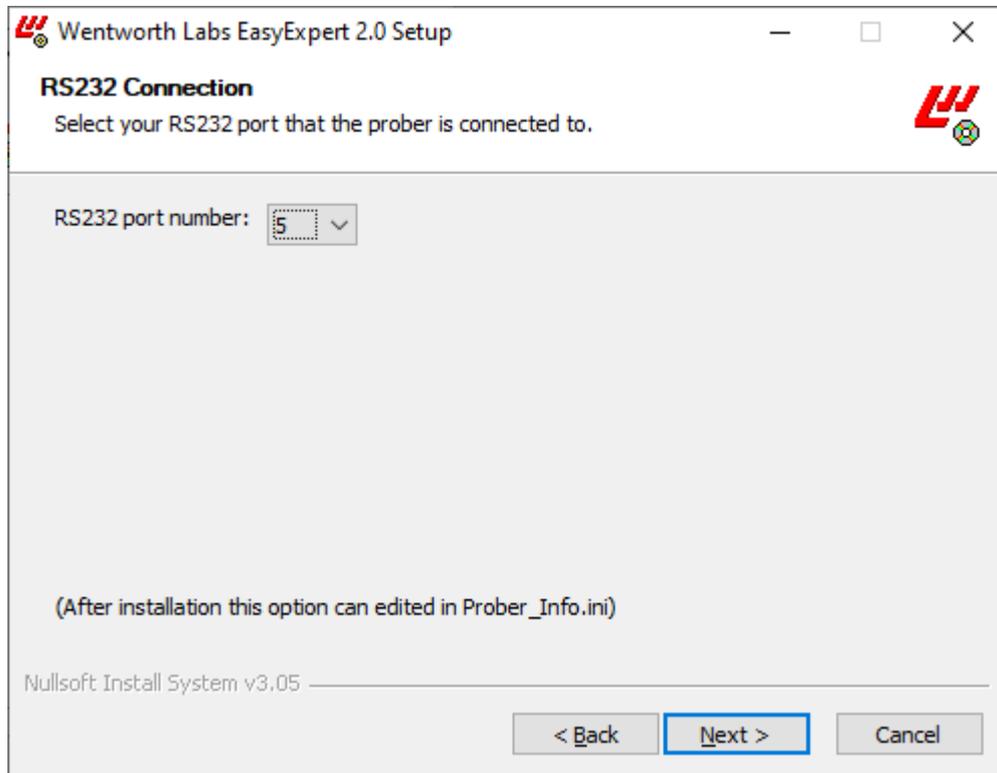
If an GPIB connection type is selected the *GPIB Connection* page be displayed when you press *Next>*. You should select the GPIB port number of the prober (eg, for DEV3 you would select 3):
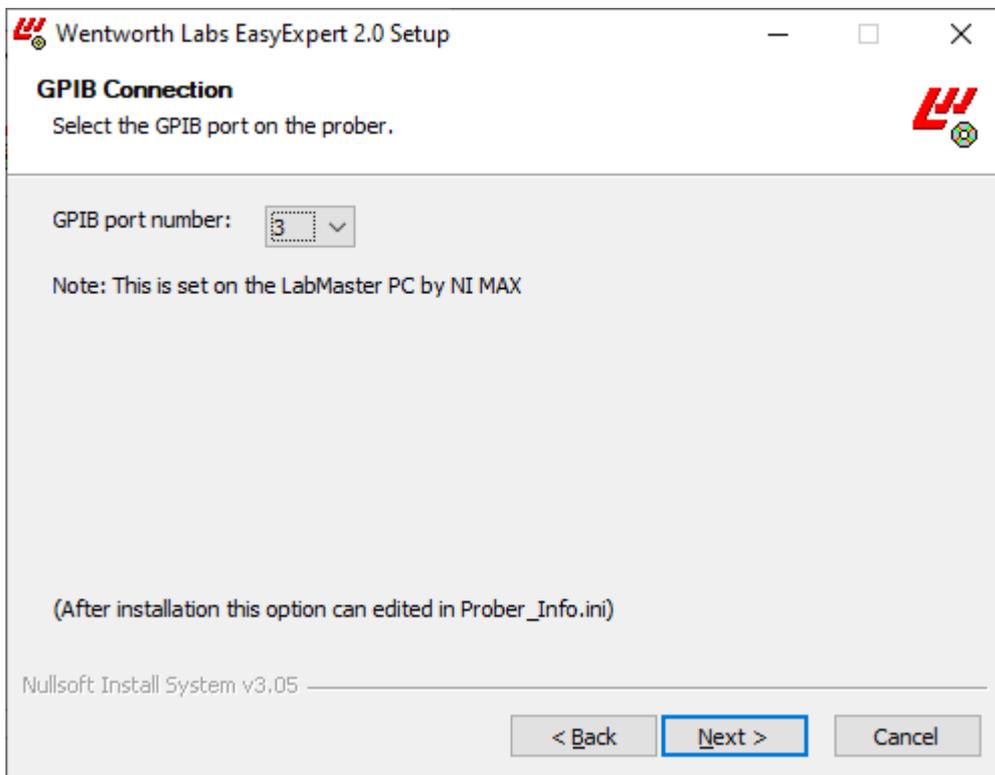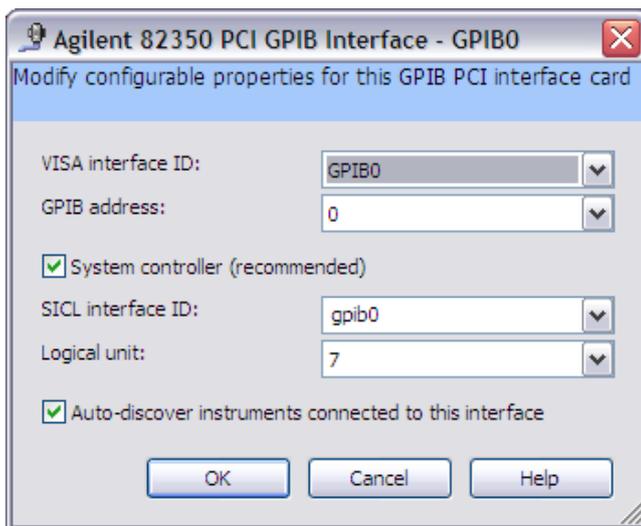
3. Configuration

Tester PC GPIB

The *Keysight Connection Expert* is used to configure the tester's GPIB port to be the system controller and for it to recognize the prober.

Start up the *Keysight Connection Expert* and edit the properties of the GPIB interface so that it looks like this:

Then add a new instrument corresponding to either the prober. To do this you will need the prober's GPIB address, then add an instrument and set its properties as appropriate:


This example is for a connection to a Pegasus™ prober with a GPIB address of 3. This value may be different depending on how you configured the device. Note: *Auto-identify* should NOT be selected as not all probers support it.

LabMaster™ FA or LabMaster™ Pro PC GPIB

If you wish to connect to a prober via PC running LabMaster™ FA or LabMaster™ Pro, it will be necessary to configure the PC's GPIB card as a slave.

The GPIB card is configured using the NI *Measurement & Automation* application. Set the GPIB0 (PCI_GPIB) configuration as shown below:
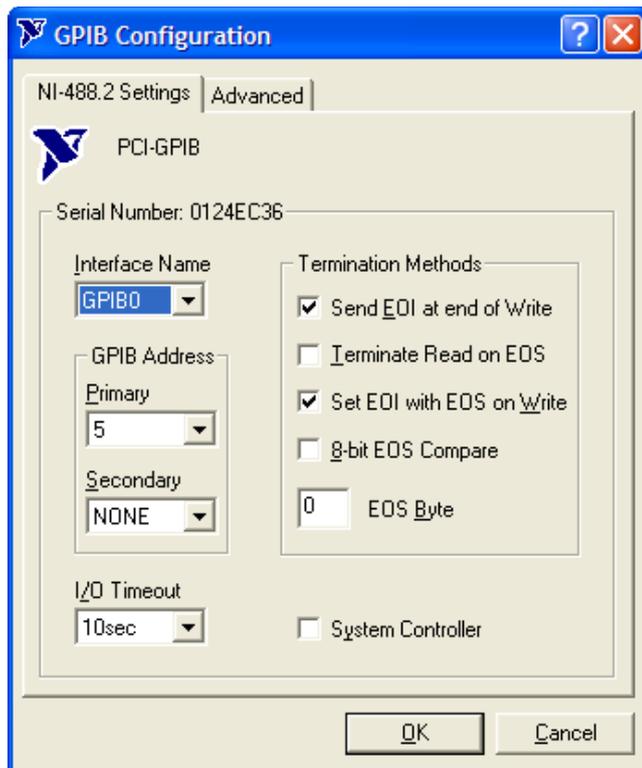
You will also need to set-up the software to accept remote commands. Please see the product's user manual for details.

Pegasus™ Prober GPIB

The *GPIB Settings* menu should be used to set-up the GPIB parameters and then *Remote Mode* should be selected. See the Pegasus™ Prober user manual for details.

Driver Files

The driver files can be found in the installation directory. On installation this directory defaults to be *c:\Pegasus*.

The driver is controlled via a configuration file called *prober_info.ini*. This configuration file is automatically set-up by the installer and should only be manually edited under direction of Wentworth Labs.

The driver writes diagnostics information to a log file called *prober.log*. Normally only error information is written to the log, but for troubleshooting more information can be written.

4.   Using EasyExpert

This section will show you how to use the system to control a Wentworth Labs prober from a Keysight B1500A tester.
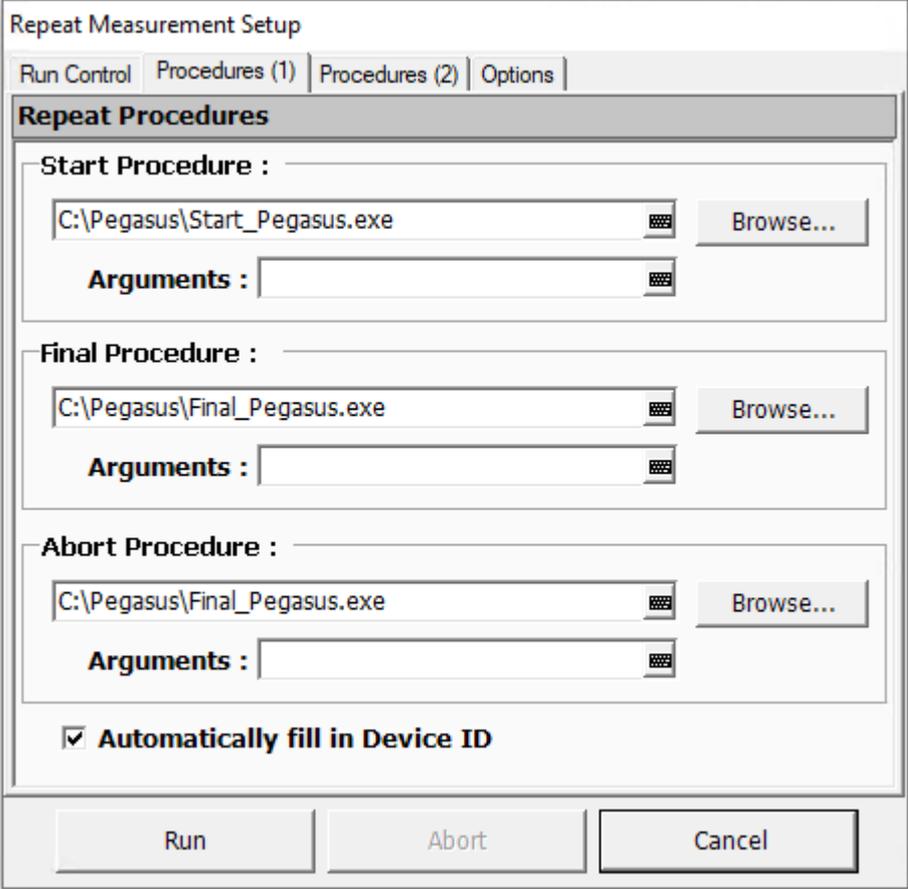
The prober must be running with an appropriate configuration before starting the test running in EasyExpert. In EasyExpert, select and configure the test you want to perform on each die. Then click on the *repeat* button:
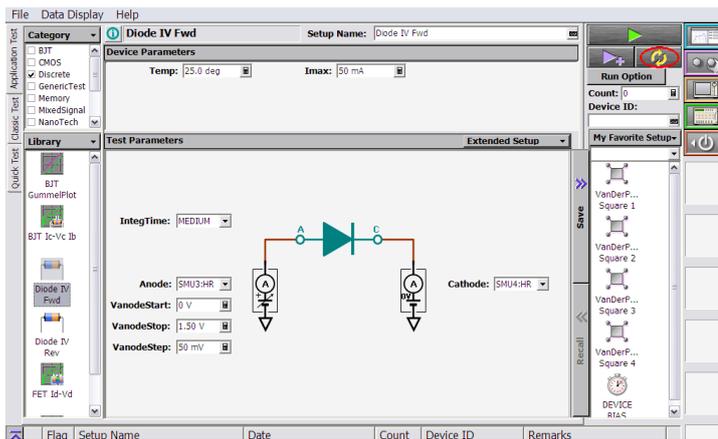
In earlier versions of EasyExpert, this will display the following simple repeat measurement setup dialog. In this case, enter the paths to the driver programs as shown in the image below:
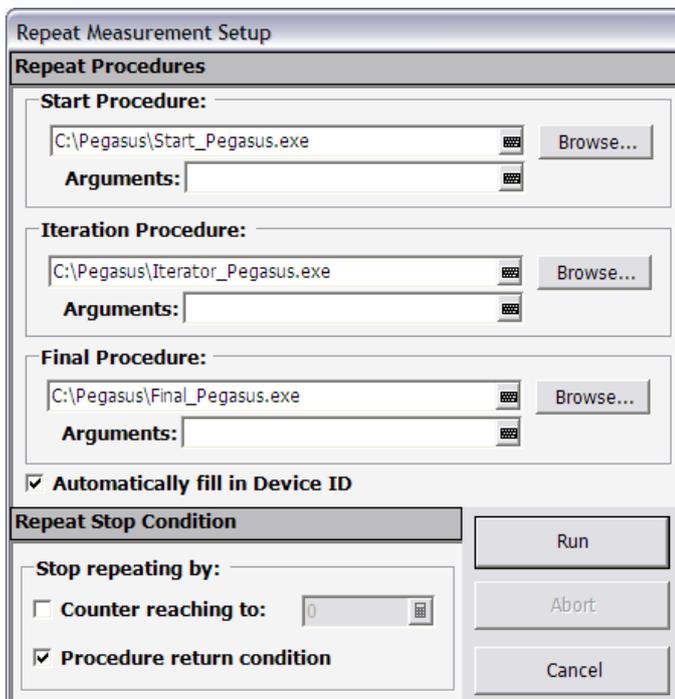
In later versions of EasyExpert, this will display the following multi-tabbed repeat measurement setup dialog. In this case, enter the paths to the driver programs as shown in the two images below:
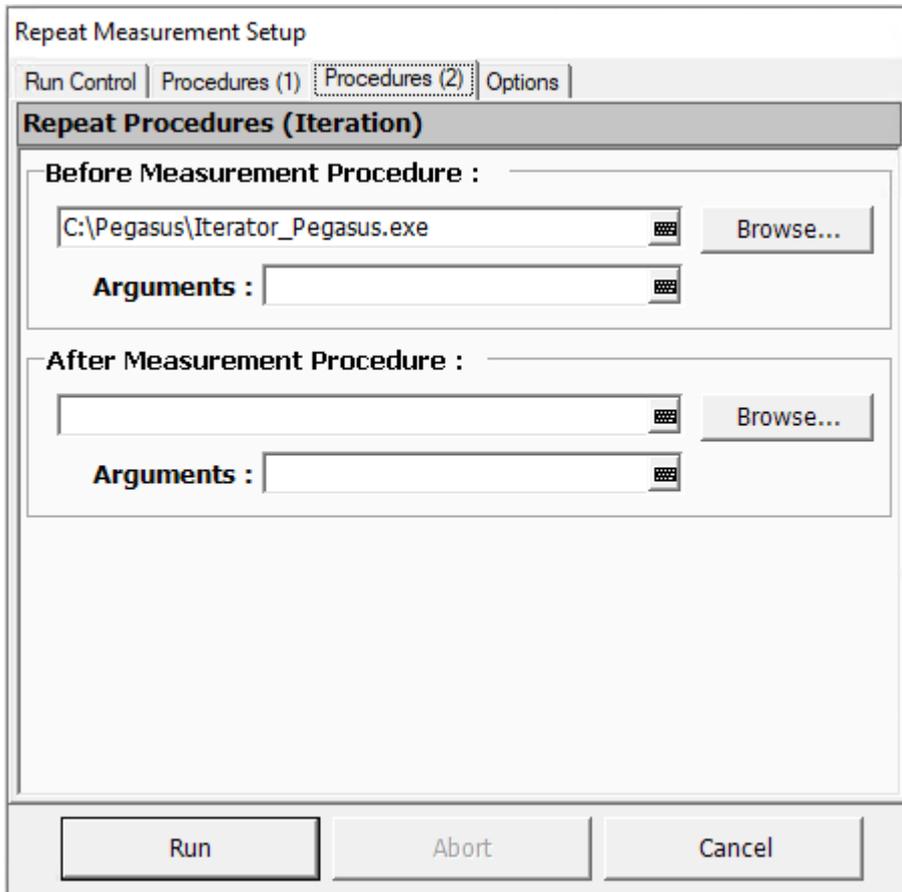
To start the test, click on the Run button, the *Start Confirmation* message box is then displayed:
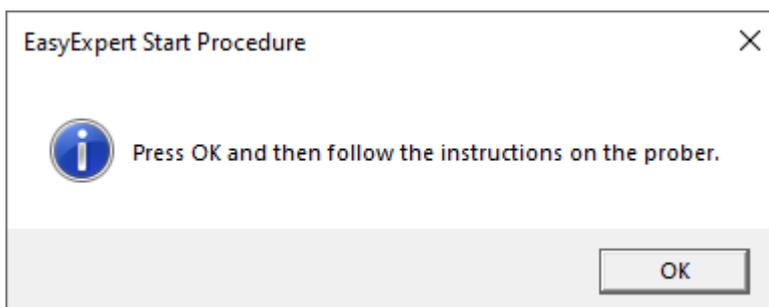
Put the wafer on the chuck and click on *OK*. Then use the Pegasus™ keypad to align the wafer and set the probes to the first die.

The tester will then step around the wafer performing the configured test on each die in turn. When it has finished the wafer can be removed from the chuck.

5. Addendum

These drivers were written by Wentworth Laboratories, based on examples and information supplied by Keysight. Wentworth Laboratories wish to thank Keysight for their help and assistance in creating these drivers.

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