This is a step by step "How to …" guide on remotely controlling your instrument using Keysight Technologies (formerly HP and Agilent) VEE Pro Development Environment. VEE is an easy to use graphical programming environment. Objects are placed on the VEE whitespace and connected up to either pass data or control the sequence of object execution.

STEP 1. Download and install Keysight IO Libraries Suite (IOLS).

Click on the link below to download the latest release of IOLS:

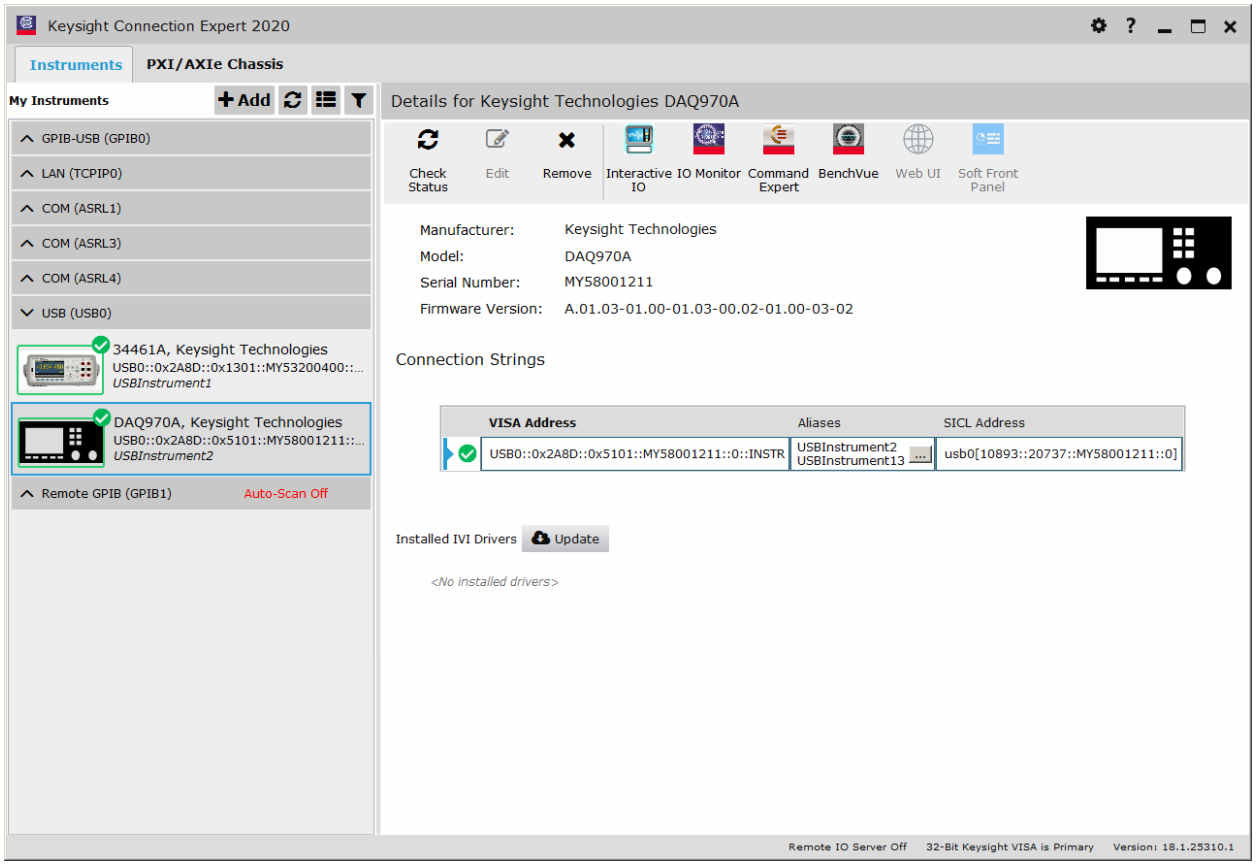
[www.keysight.com/find/iosuitedownload]

Follow the instructions to install IOLS on your computer.

STEP 2. Establish connectivity between your instrument and IOLS.

Connect your instrument to your computer via GPIB, LAN, USB, or RS-232 interface. Double-click the IOLS icon in the Windows system tray to start Keysight Connection Expert. Alternately, you can select Keysight Connection Expert from *Windows Start > All Programs* menu.

For GPIB and USB based instruments or a LAN based instrument on a local subnet, Connection Expert should scan and find your instruments automatically. If Connection Expert's auto-discovery does not find your instrument, you can manually add it. RS-232 (serial) based instruments will need to be added manually as well as LAN based instruments not on a local subnet. Below is a snapshot of Connection Expert screen:



NOTE: Connection Expert automatically saves the instrument configuration.

STEP 3. Download and install Keysight VEE Pro Development Environment (VEE).

There is a free 30 day evaluation version of VEE Pro available at this link:

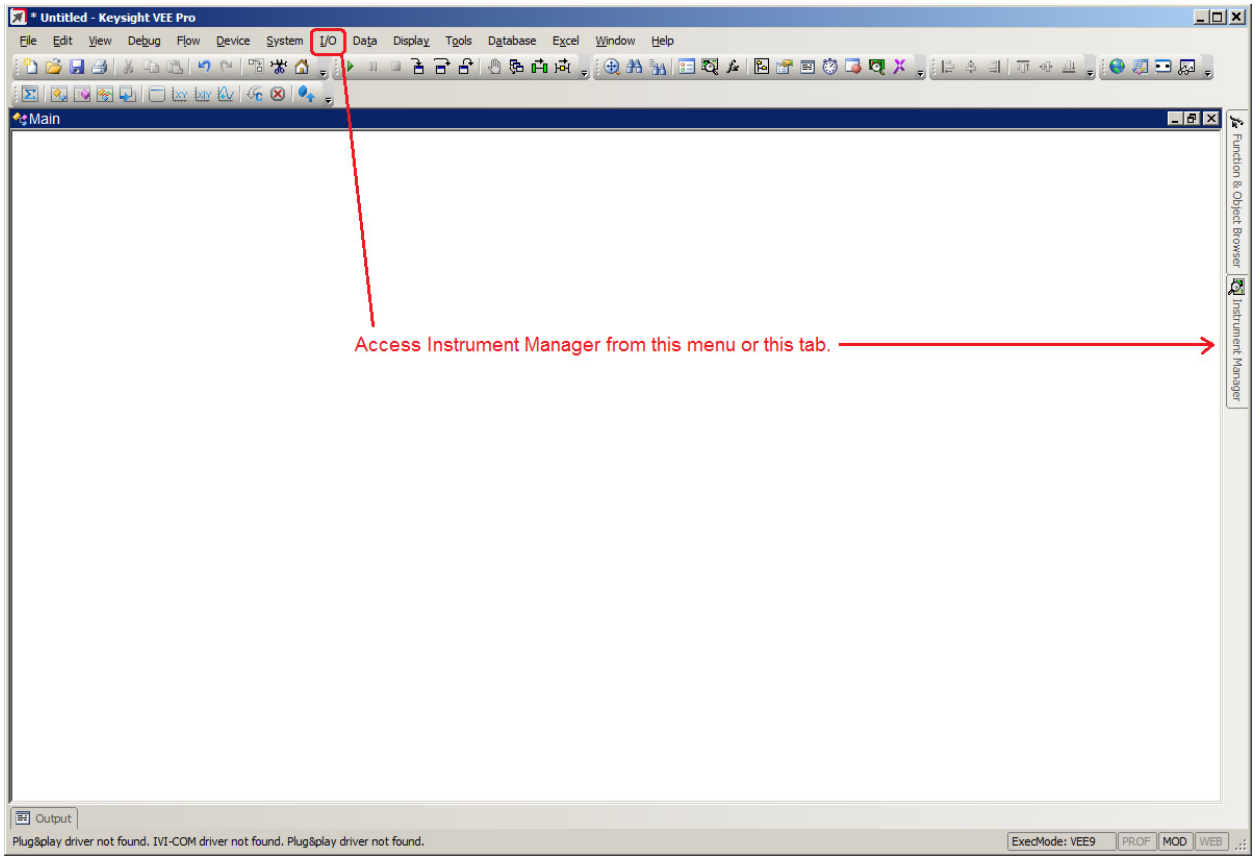
[www.keysight.com/find/vee_download]

Follow the instructions to install VEE on your computer.

STEP 4. Start VEE and open Instrument Manager.

Start VEE from either its desktop icon or *Windows Start > All Programs* menu.

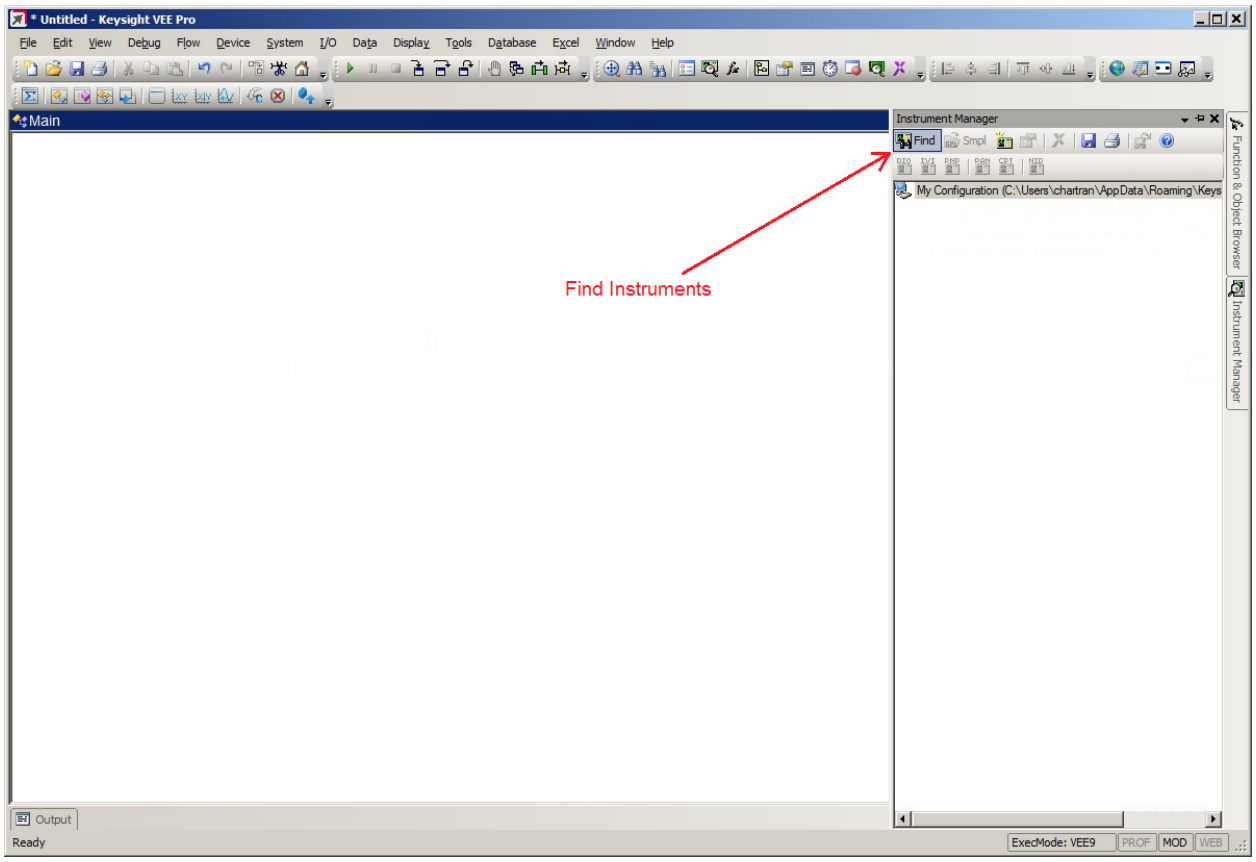
Select Instrument Manager from either the I/O menu or the tab as shown below.



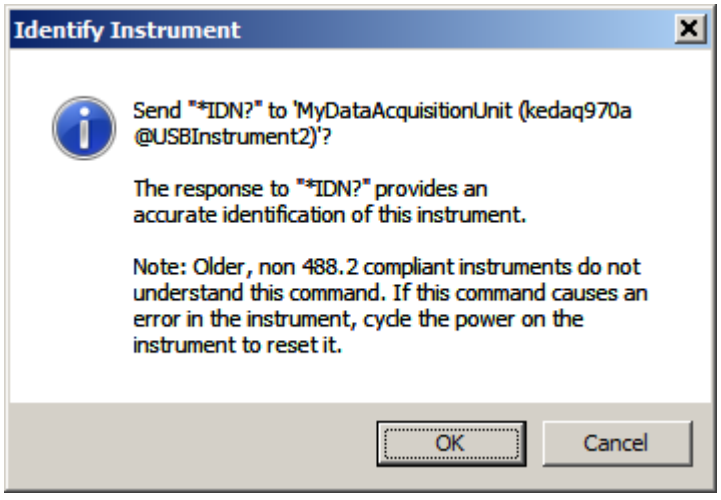
STEP 5. Use Instrument Manager to find instruments in VEE.

Press the "***Find***" icon as shown on the next page.

NOTE: VEE depends on the instrument configuration in IOLS to find instruments.



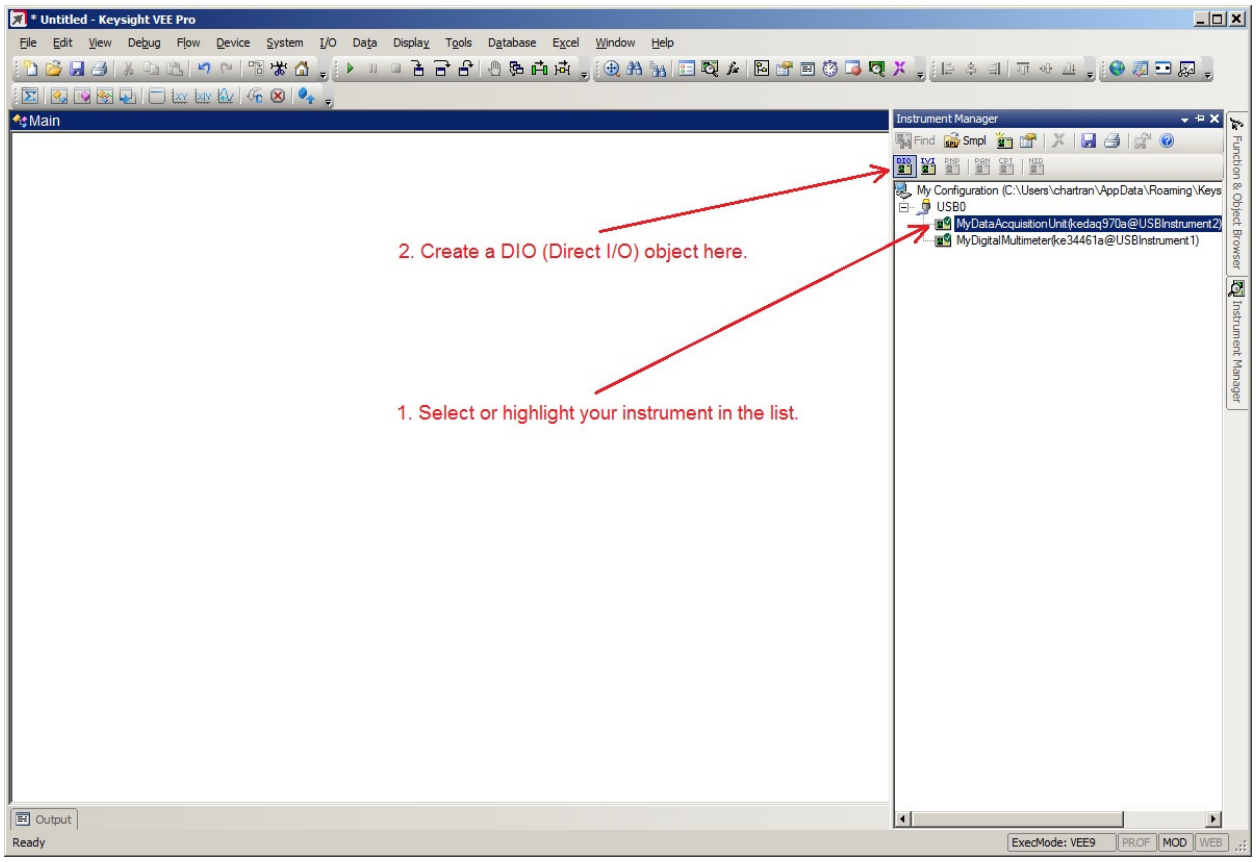
As instruments are found, VEE will pop up a message below to identify each instrument.



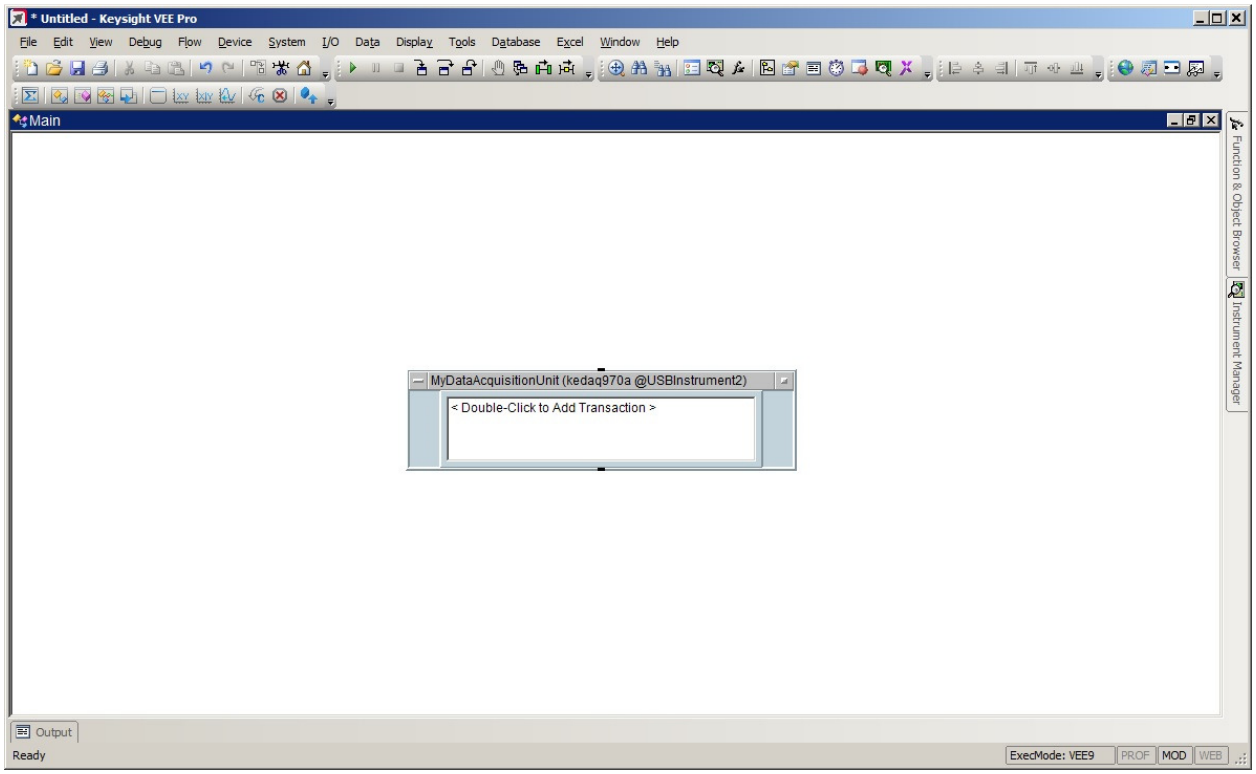
Each instrument will be added to the configuration in Instrument Manager.

STEP 6. Add a direct IO object for your instrument to the VEE whitespace.

First, select your instrument in the Instrument Manager Configuration list. Next, click and drag the "***DIO***" (***Direct I/O***) icon to the whitespace area. Release your mouse button to drop a ***Direct I/O*** object there. See the two screenshots on the next page.



A ***Direct I/O*** object is shown for your instrument on the VEE whitespace below. This object is used to write IEEE-488.2 common commands, SCPI commands, or SCPI queries **directly** to your instrument. Responses from your instrument can be read **directly** by this object.

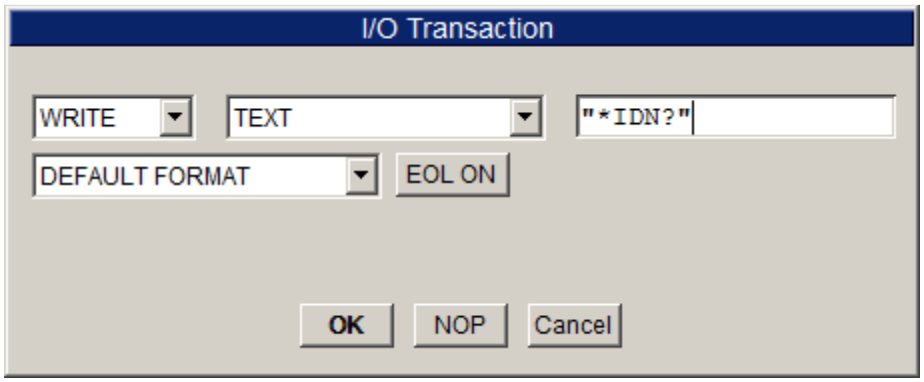


STEP 7. Add a write and a read transaction to the Direct I/O object.

Double-click inside the ***Direct I/O*** object to add a transaction. By default a **WRITE** transaction pops up.

Add the IEEE-488.2 common query to identify your instrument ("***IDN?**") as shown below.

Click the **OK** button to add this transaction to the Direct I/O object.

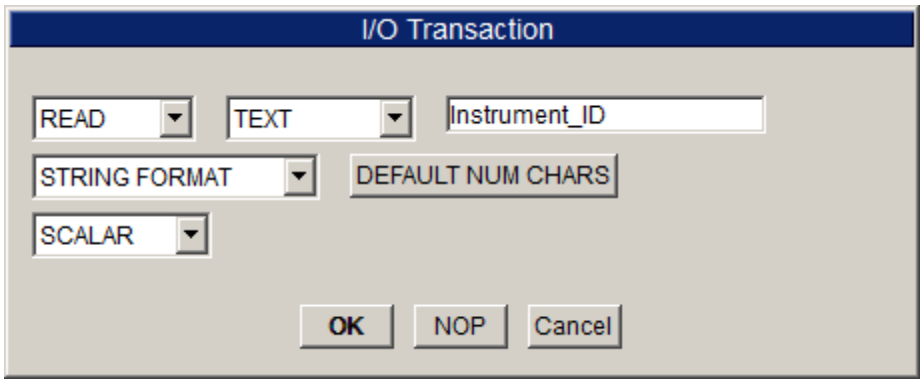


Double-click inside the ***Direct I/O*** object again to add a second transaction.

Select a **READ** transaction and string format.

Enter a variable name such as "***Instrument_ID***" (without the quotes).

Click the **OK** button again to add this second transaction to the ***Direct I/O*** object.



See the screenshot on the next page. An output terminal is created on the object titled ***Instrument_ID***.

STEP 8. Add a display object and a connecting line between the object terminals.

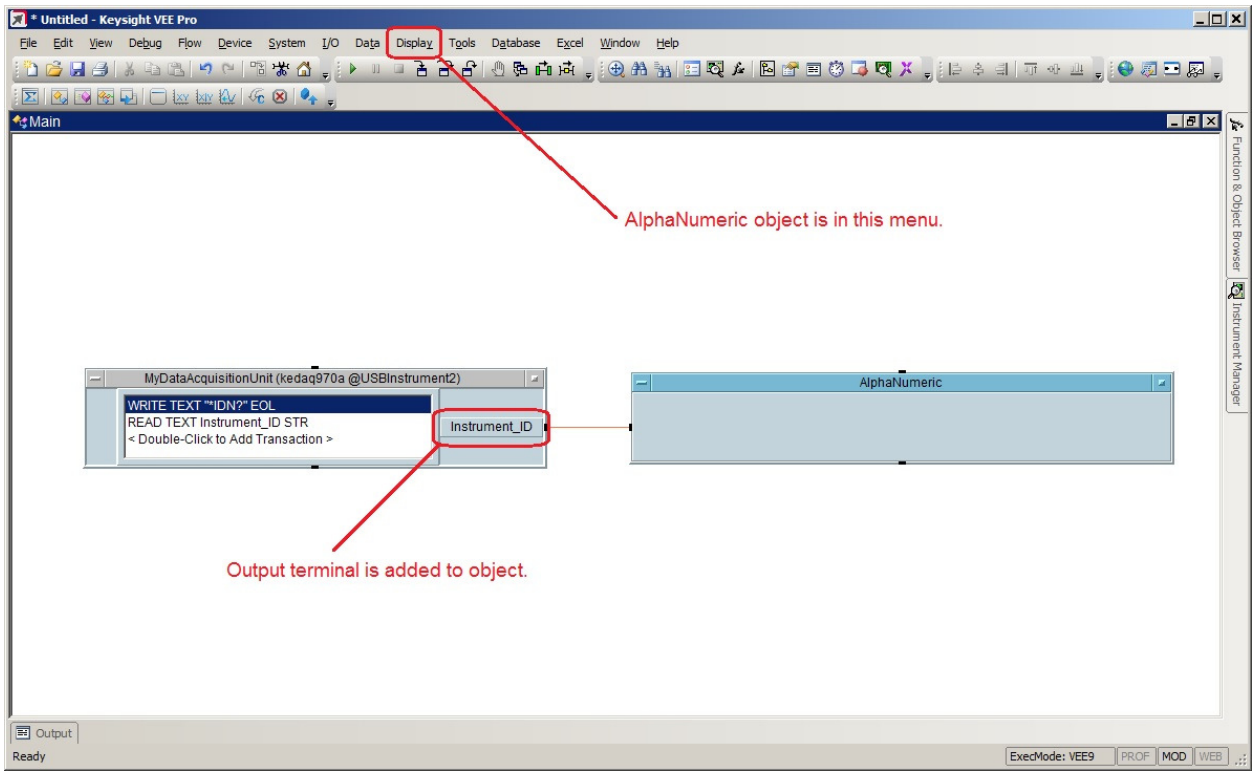
From the VEE display menu, click and drag an ***AlphaNumeric*** display object onto the VEE whitespace.

Now, you want to connect (or wire) up these two objects to complete this VEE program.

Click and drag near the ***Instrument_ID*** output terminal just outside the ***Direct I/O*** object over near the input terminal on the left-hand side of the an ***AlphaNumeric*** display object and release to place an orange wire between the objects. Orange wires indicate textual data.

Verify this VEE program looks like the screenshot below.

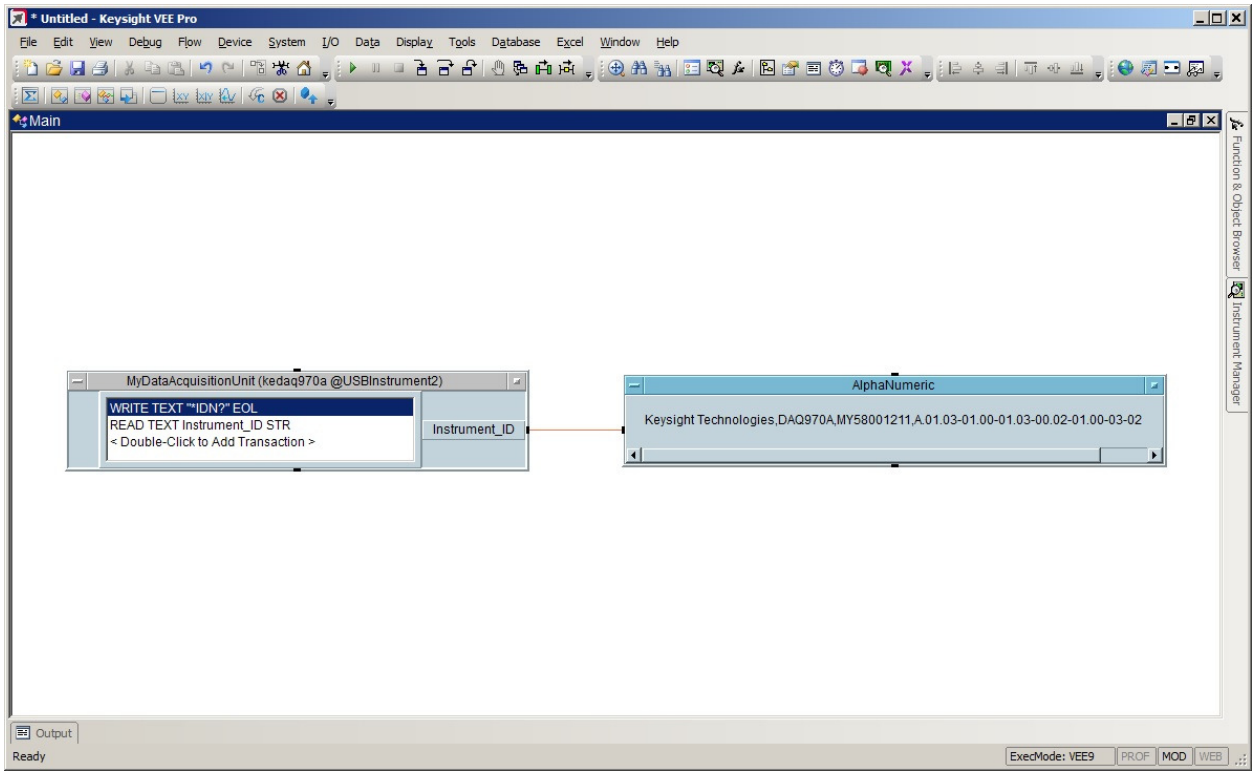
From the VEE file menu, click on save and enter a filename to save this VEE program.



STEP 9. Run your VEE program.

Now, you are ready to execute this VEE program containing these two objects.

Click on the green run (or play) button. See the screenshot on the next page.



If successful, the VEE program starts with the ***Direct I/O*** object which will write the identification query ("***IDN?**") out to your instrument and read the identification string from your instrument. This identification string is passed to the ***AlphaNumeric*** display object and the VEE program stops.

Congratulations! You have successfully created a simple VEE program that remotely controls your instrument.

Check out the Keysight YouTube channel for short videos on VEE as well as other Keysight products.

[https://www.youtube.com/user/keysight]