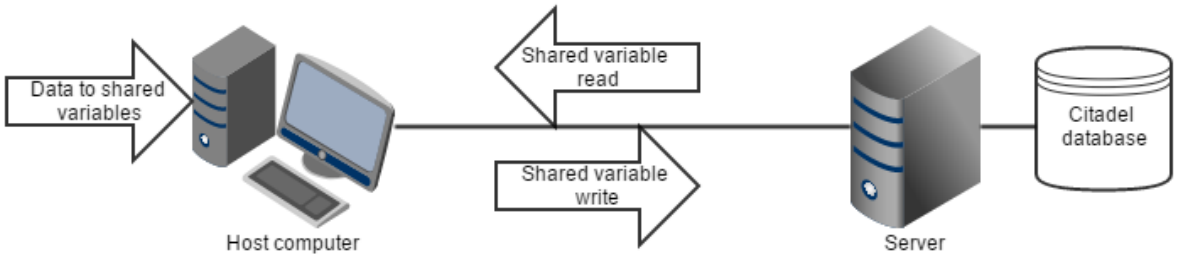
WRITING SHARED VARIABLE DATA ACROSS A NETWORK

This guide is relevant to LabVIEW DSC 2013 and later.

OVERVIEW

This guide will walk you through using the LabVIEW DSC library to read and write shared variable data across multiple computers on a single network. By default, shared variables with Data Logging enabled will automatically write to a Citadel database on the host computer. Writing to a remote server instead allows multiple host computers to write to a single database, which minimizes database management. The diagram below shows a network setup where shared variable data is written across the network from the host computer to a server that hosts the Citadel database.

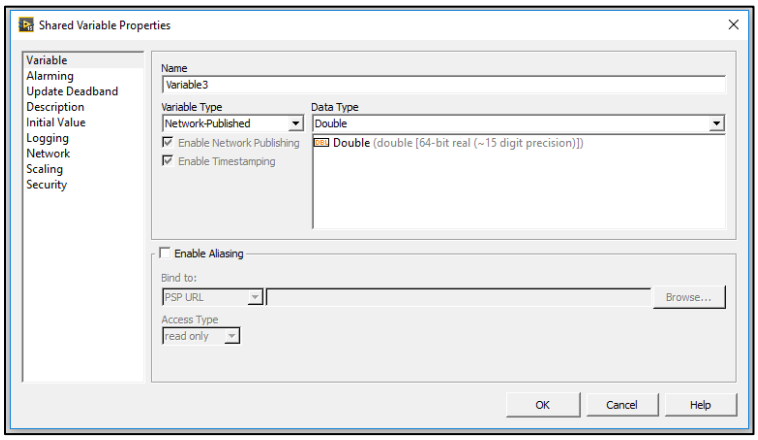


CREATING THE SHARED VARIABLES

You will need to create your shared variables and the shared variable library before proceeding.

To create a shared variable and shared variable library:

Open a project in LabVIEW. In the Project Explorer window, right-click on **My Computer** and select **New >> Variable** from the context menu. This will automatically create a library in the project and open the **Shared Variable Properties** dialog. It is recommended that you name the shared variable library *Shared Variable Library*, or similar, to easily identify it.



In the Shared Variable dialog:

1. Select **Network-Published** from the **Variable Type** dropdown.
2. In the left pane, select **Logging** and mark the **Enable Logging** checkbox in the right pane.
3. Click **OK** to save your settings.
4. In the **Project Explorer** window, select **Save All** to save the project and new library.

After creating a shared variable, modify its properties by right-clicking the new variable in the **Project Explorer.**

After creating a shared variable and library, you can access the **Shared Variable Properties** dialog at any time by right-clicking any shared variable and selecting **Properties** from the context menu.

Tip

Right-click on any shared variable in the Project Explorer and select **Multiple Variable Editor** from the context menu to modify all variables in the library from a single dialog.

CONFIGURING THE SHARED VARIABLE LIBRARY FOR NETWORK ACCESS

All host computers and the data server need to be on the same network and in the same Workgroup.

To check the name of the workgroup, right-click **This PC** in Windows 8 and up, or **Computer** in Windows 7, and select **Properties** from the context menu. The workgroup is listed under **Computer name**, **domain**, and **workgroup settings**.

To change the Workgroup, click **Change settings** to open the **System Properties** dialog, and click **Change** on the **Computer Name** tab. Update the Workgroup name and click **OK**.

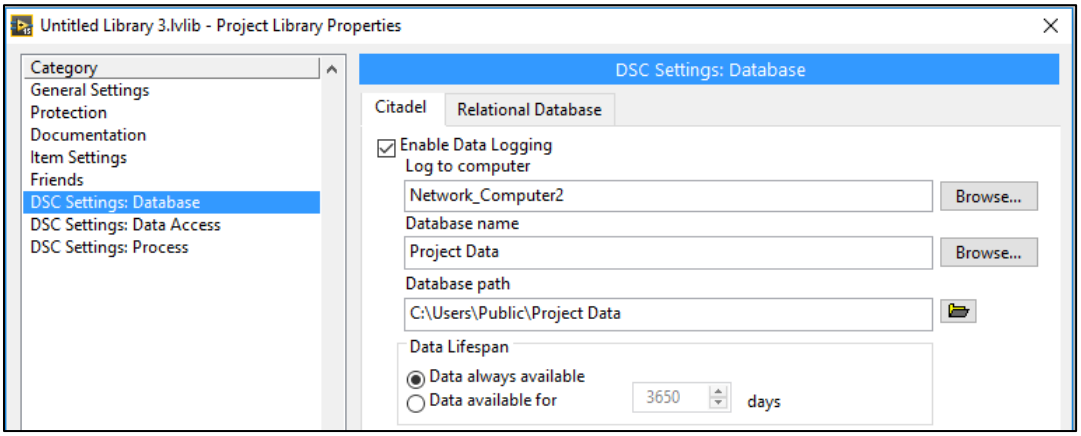
Turn on network and file sharing on each computer so that they are visible on the network. To turn on sharing, go to **Network and Sharing Center** from the Control Panel and click **Change advanced sharing settings**. Turn on network discovery and file sharing and click **Save changes** to exit.

Note
All host computers and the server must both have the DSC Run-time deployment license installed!

In addition to the network setup for the shared variable library, several exceptions need to be made in Windows Firewall on all network computers to allow the Shared Variable Engine and Citadel database to communicate across the network. National Instruments has documented the firewall exceptions here: http://digital.ni.com/public.nsf/allkb/0D7B86F4B4D19A5E86256F9A006EECB1.

Once the computers have been configured to communicate across the network, return to the **Project Explorer** window.

1. Right-click on the library containing your shared variables and select **Properties** to launch the **Project Library Properties** dialog.
2. Under **Category,** select **DSC Settings: Database**.



3. Check **Enable Data Logging**.
4. Next to the **Log to Computer** field, click **Browse** to find the network computer (or server) that will host the database.
5. In the **Database Name** field, give the database a unique name.
6. Enter a file path for the database in the **Database Path** field. This will be the file path on the server computer.

Tip

National Instruments recommends putting the database in the **C:\Users\Public** folder in order to avoid issues with Write privileges across multiple user accounts.

Caution

Do not use the **Browse** button to set the database path! This will redirect the path to the local host.

7. Click **OK** to exit the dialog.
8. In the **Project Explorer**, right-click the shared variable library and select **Deploy**. This will deploy the library and save all settings to the shared variables.
9. Click **Save all** in the **Project Explorer** to save the project.

Any variables added to this library will now write to the server instead of the host computer.

WRITING DATA TO SHARED VARIABLES USING DATASOCKET WRITE

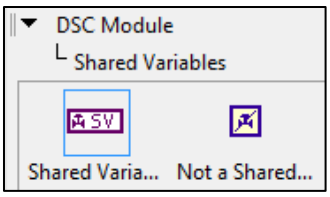
Typically, data is written to a shared variable by using a shared variable node.

For projects with few shared variables, this is a valid method; however, projects written with the DSC library typically have many more shared variables.

The best practice for writing shared variables using the DSC library is to use the **DataSocket Write** VI. Using DataSocket VIs instead of shared variable nodes eliminates potential race conditions by introducing data flow to the code. A DataSocket VI will also allow an array of shared variables to be written simultaneously.

USING THE DATASOCKET WRITE VI

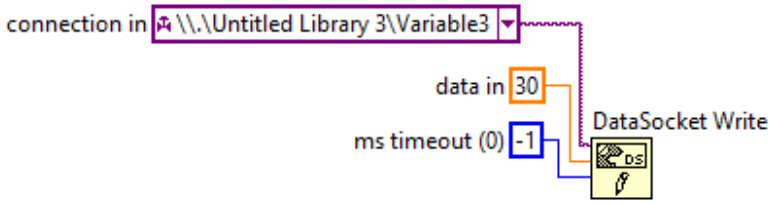
1. On the block diagram, right-click and select **DSC Module >> Shared Variables >> Shared Variable Constant**.



2. Once the constant has been placed on the block diagram, click the down arrow on the constant and select the shared variable to be written. Clicking the down arrow lists all shared variables in the project.

Tip
Replace "My Computer" in the file path with a period (e.g. **\\.\Library\Variable**). This eliminates a bug that occasionally generates an error when searching the variable location.

3. Right-click and select **DSC Module >> Shared Variables >> DataSocket >> DataSocket Write** and place the VI on the block diagram.
4. Wire the shared variable constant to the **connection in** terminal on the **DataSocket Write** VI.
5. Wire the data to the **data** terminal. Make sure the data type of the data matches the data type of the shared variable.
6. Set the **ms timeout** to **−1**. This forces the VI to wait for data instead of timing out.



READING DATA FROM SHARED VARIABLES USING DATASOCKET READ

Shared variable data is written from the host computer to the Citadel database on the server, but it can be read from any configured computer on the network. Use **DataSocket Read** to read from a shared variable stored anywhere on the network.

> **Note**
> Any computer reading shared variables from the Citadel database must have the DSC Run-time deployment license installed!

USING THE DATASOCKET READ VI

1. Place a shared variable constant on the block diagram and click the down arrow to browse to the shared variable to be read.
2. Right-click on the block diagram and select **DSC Module >> Shared Variables >> DataSocket >> DataSocket Read**.
3. Wire the shared variable constant to the **connection in** terminal.
4. Wire a constant of the shared variable's data type to the **data type** terminal. The value of the constant does not matter.
5. Wire the **data** terminal to an indicator so that it can be seen on the front panel.