



## Using VISA on Windows through the TAMS 3010 Gateway

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This note demonstrates the basic steps required for communicating with remote GPIB (hpib) devices through the TAMS 3010 LAN-HPIB gateway, using VISA. The example assumes Windows 2000 installed on the client workstation, with Agilent I/O Libraries Suite 14. While the information is generally applicable to other environments, there could be syntax or operational differences that require the procedures to be modified. Previous versions of the I/O Libraries (A through M) are substantially different in the user interface. The Agilent I/O Libraries are sold and supported by that company, the information here is just provided as a convenience for TAMS customers. Of course, a short note like this cannot cover all the information contained in the various user manuals that are available, and is not intended as a substitute for them.

### **The basic steps required to set up the system are:**

1. Configure the TAMS 3010 on the network
2. Run Agilent Connection Expert to configure the instrument
3. Communicate with the remote device



## 1. Configure the TAMS 3010 on the network

This example assumes a machine name of “dio2” is assigned on the local network to ip address of 243.102.244.154. The 3010 comes configured originally at 192.0.0.192, which requires a “route” command be used to allow communication at that address.

The following requires that you be logged in with Administrator privileges. Open a command prompt window on the Windows machine, and input the route command:

```
> route add 192.0.0.192 windows_client
```

where “windows\_client” is the name of the Windows machine. Execute a “ping” command to demonstrate connectivity:

```
> ping 192.0.0.192
```

```
Pinging 192.0.0.192 with 32 bytes of data:
```

```
Reply from 192.0.0.192: bytes=32 time<10ms TTL=255  
Reply from 192.0.0.192: bytes=32 time<10ms TTL=255  
Reply from 192.0.0.192: bytes=32 time<10ms TTL=255
```

```
Ping statistics for 192.0.0.192:
```

```
    Packets: Sent = 3, Received = 3, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

```
Control-C  
^C
```

Now that communication with the 3010 has been established, it can be configured with the “telnet” command to set it to the desired address. The “echo yes” command lets you see what you’re typing in:

```
> telnet 192.0.0.192 3010  
Trying...  
Connected to 192.0.0.192.  
Escape character is '^]'.  
Gateway Configuration version 1.1.0  
Copyright 2002, Test & Measurement Systems Inc.
```



Type "help" by itself to get a list of valid commands

```
> echo yes
>
> ip 243.102.244.154
> subnetmask 255.255.255.0
> gateway 243.102.244.70
> hostname dio2
> config
hostname:          dio2
hwaddress:         00:02:B6:19:6A:5A
ip:                243.102.244.154
gateway:           243.102.244.70
subnetmask:        255.255.255.0
lantimeout:        0
iotimeout:         120
maxconnections:    0
RS-232 Interface (COM1): COM1
HP-IB Interface (hpib): hpib
> save
Are you sure that you want to save changes and reboot? [Yes | No]
> YES
```

Wait about a minute for three beeps, signifying the gateway has rebooted.

Verify the gateway is accessible on the network at its new address:

```
> ping dio2

Pinging dio2.tamsinc.com [243.102.244.154] with 32 bytes of data:

Reply from 243.102.244.154: bytes=32 time=16ms TTL=255
Reply from 243.102.244.154: bytes=32 time<10ms TTL=255
Reply from 243.102.244.154: bytes=32 time<10ms TTL=255

Ping statistics for 243.102.244.154:
    Packets: Sent = 3, Received = 3, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 16ms, Average = 5ms
Control-C
^C
```



## 2. Run Agilent Connection Expert to configure the instrument

Now we're ready to configure the gateway for communication via VISA. Open the "Agilent Connection Expert" by using the Agilent I/O Control shortcut on the toolbar, or by Start/Programs/Agilent IO Libraries Suite/Agilent Connection Expert. This will give a display of the available interfaces below the local machine name. The interface of interest of course is the LAN:

```
Windows_client
  LAN(TCPIP0)
```

Right click on LAN, then Change Properties. This allows a choice of LAN protocol, (VXI-11 or SICL-LAN, or auto), along with some timeout parameters and interface names. See the separate TAMS FAQ for information on which protocol is most appropriate. The default values on the screen are adequate for most purposes:

```
VISA Interface ID:          TCPIP0
Default Protocol:          Auto
Connect timeout:           5000 ms
LAN maximum timeout:       120 seconds
Client delta timeout:      25 seconds
SICL Interface ID:         lan
SICL Logical Unit:         30
```

Next, right-click on LAN, and select "Add Instrument". This lets new instruments be added, either automatically or manually. Now double-click on LAN, which opens a window that allows the search. Type in either the hostname or IP address of the 3010:

```
Hostname:      dio2.tamsinc.com
IP address:    243.102.244.154
```

Next, click on "Find Instruments".

For the "Find Instrument Types" selection, check only the GPIB box. The LAN box would be used if you were searching for instruments connected directly to the LAN. Then, select "Find Now". The LAN will be searched for instruments to add. It appears to be a bug that many machines are searched, in addition to 'dio2'.

An entry should appear like this:



```
Hostname:      dio2.tamsinc.com
IP address:    243.102.244.154
Remote Name:   hpib,7
```

Closing out this screen shows that the entry for the device now appears below the LAN interface:

```
Walden
  LAN(TCPIP0)
    54615B(TCPIP0::dio2.tamsinc.com::hpib,7::INSTR)
```

This means that an instrument was found on the bus known to the 3010 as “hpib”, at bus address 7. The device was automatically identified as a 54615B. Note that the Agilent Connection Expert retains information about where instruments have been found. If they are not found there in the future, the entry is not automatically removed, but marked with a small red X.

You can right click on the new entry, and select “Add VISA Alias” in order to assign a name that is easier to work with, such as “myscope”:

```
Walden
  LAN(TCPIP0)
    54615B(TCPIP0::dio2.tamsinc.com::hpib,7::INSTR)
      myscope
```

Right clicking on either of the bottom two entries gives the opportunity to send and receive commands easily with the instrument. Sending a \*IDN? command and receiving the reply identifies most modern instruments:

```
-> *IDN?
<- HEWLETT-PACKARD,54615B,0,A.02.30
```

Now, we have VISA configured to allow communication with the oscilloscope, calling it either “myscope” or “TCPIP0::dio2.tamsinc.com::hpib,7::INSTR”



### 3. Communicate with the remote device

Now we're ready to create a C program to communicate with the device using the VISA libraries. Agilent provides sample programs installed by default under `C:\Program Files\Agilent\IO Libraries Suite\ProgrammingSamples\C\VISA`. The program "idn.c" is suitable.

For this program, the `viOpen` statement requires that the name of the interface be hard coded in the line. We'll use "myscope" for convenience:

```
viOpen (defaultRM, "myscope", VI_NULL,VI_NULL, &vi);
```

The program must now be compiled and run, using a suitable environment such as Microsoft Visual Studio. See the "Agilent VISA Users Guide" for assistance in compiling and running the program. This can be found by clicking on the "Agilent I/O Control" icon, and going to `Documentation/VISA Users Guide`.

Running the program, we now see the information returned from the \*IDN? request:

```
Instrument identification string: HEWLETT-PACKARD,54615B,0,A.02.30
```