Application Note

Understanding IEEE/GPIB Interface Cards on the Digibridge Line of RLC Meters

Summary

The IET Labs 1689 and 1693 Digibridges can easily be automated into test system using the IEEE-488/GPIB Interface.

It is important to understand there are 2 different types of interface cards used on the Digibridge line. You must understand which interface you have to successfully control the Digibridge.

IET Labs does have LabView drivers for both the new style 1689-9640 Interface Card and the old style interface cards available for download. The initialization vi is specific to the new or old style interface card.

LabView drivers can be found at LabView driver download

This application note details how to successfully communicate to the different types of IEEE/GPIB Interface Cards used in the Digibridge Series of RLC Meters.

Please note that we can provide support for the new 1689-9640 IEEE Interface card however we cannot provide technical support on the old style interface cards beyond this application note.

Detail

The new 1689-9640 IEEE.2 Interface Card

The new 1689-9640 IEEE.2 Interface Card was designed by IET Labs and is designed to be an ieee.2 and SCPI compatible interface. You can use NI-VISA and NI-Max to scan for instruments on the bus. The card is a listener/talker on the bus. This is an ieee.2 interface similar to most other modern instrumentation GPIB interfaces.

If you look at the interface card and it has an RS-232 Interface it is a 1689-9640. See Figure 1 below.

With the 1689-9640 you can open NI Max and scan for instruments and the Digibridge will be found as a device on the bus.

It is important to note that if you have a Digibridge that has been integrated into a system and currently uses the 1658-9620 Low Speed, 1689-9620 or 1689-9630 High Speed interfaces you cannot directly substitute the 1689-9640 for one of the old interface cards. The initialization string in the software would have to change.

More information on the 1689-9640 GPIB Interface Card can be found at the link below.

https://www.ietlabs.com/1689-9640.html

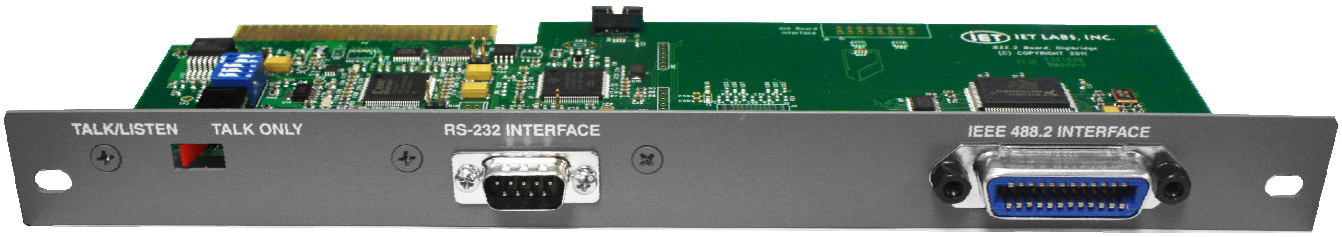

Figure 1. Picture of the 1689-9640 New Style GPIB Interface Card

The old style IEEE/GPIB interface cards 1658-9620, 1689-9620 and 1689-9630
The old style IEEE/GPIB interfaces are the 1658-9620 Low Speed, 1689-9620 and 1689-9630 High Speed interfaces.

If you look at the interface card and it has a Handler Interface it is an old style interface card. See Figure 2 below.

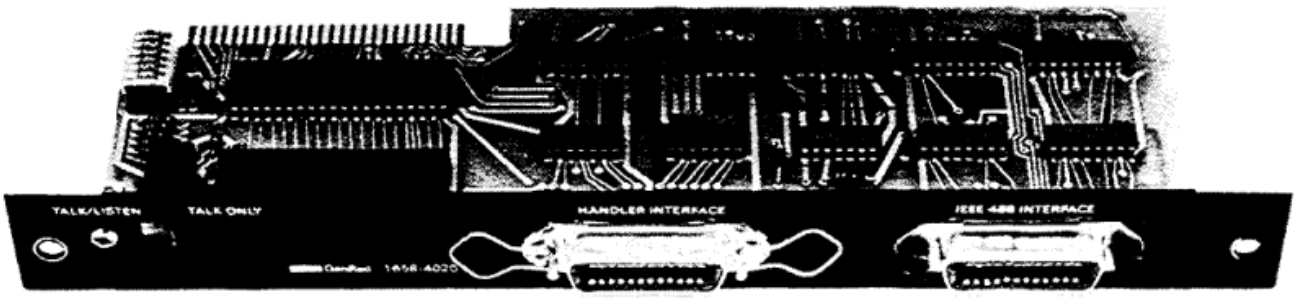

Figure 2. Picture of the old style GPIB Interface Card

These interfaces are ieee.1 at best given a 1970s design timeframe. The old style interface cards were originally designed for use with HP dot matrix printer with a HPIB interface. This is why the older Interface cards are a controller on the GPIB interface. The old style interface cards also worked very well with HP "calculators" which were very common in instrumentation at the time.

When using PC and a GPIB card like the NI GPIB-USB-HS however the old style interface cards will not work like a typical instrument with GPIB. You cannot open NI Max and scan for instruments on the GPIB bus.

When controlling the Digibridge via the GPIB interface, the PC must be Controller and the Digibridge a Listener. Since the old style interface cards are by default a controller, there are low level commands must be sent ensure there is only one controller on the bus. If they are not sent the Digbridge will lock the GPIB bus.

When using NI Max and a GPIB-USB-HS card you do the following to control the Digibridge.
Open NI- MAX
Under My System>Devices and Interfaces and then select NI GPIB-USB-HS "GPIB0"
You can then click on Interactive Control which will popup a GPIB Interactive Control.

In the interactive control box you can type the following commands
IBFIND GPIB0
IBSIC
IBGTS 1
IBFIND DEV3 (note this assume the gpib address on the old style interface card is set to an address of 3) Otherwise change "3" to the address the card is set

Once this is complete the old style interface card is now a listener on the bus.

All of these commands can be send as well via LabView or other programs using the NI drivers and either MISC commands or ieee.1 commands.

You can then send any of the commands shown in the manual to control the Digibridge.

Such as send IBWRT “P2X6G0” this results in reset to default, set output to primary and secondary parameters, make a measure.

You can then read the data back using an IBRD

Please see the Figure 3 showing an example of using NI Max and Interactive Control to communicate with the Digibridge.

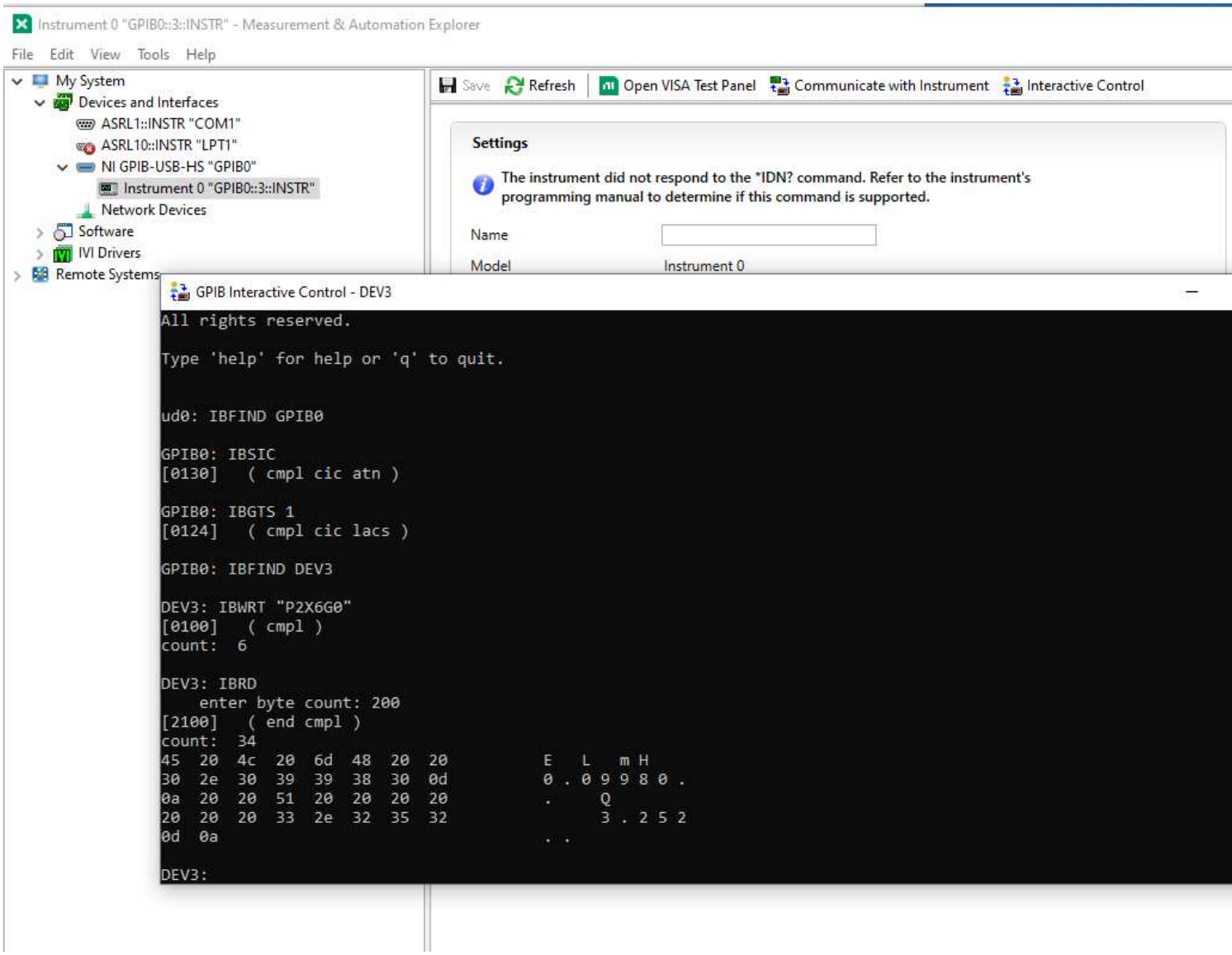

Figure 3. NI Max and Interactive Control.

Conclusion

The 1689 Digibridge and 1693 Digibridge can easily be controlled with either the 1658-9620 Low Speed and 1689-9620 and 1689-9630 High Speed interfaces or the new 1689-9640.

The new 1689-9640 is ideal for new applications and makes communication with the Digibridge simple.

More information on the Digibridge Line of LCR Meters and the 1689-9640 can be found at the links below.

https://www.ietlabs.com/1689-9640.html
https://www.ietlabs.com/1689.html
https://www.ietlabs.com/1693.html