

IEEE 488

**APPLICATION
BULLETIN**

USING LABVIEW WITH THE 4864 GPIB RELAY INTERFACE

INTRODUCTION

The purpose of this application note is to demonstrate the use of LabView™ to control ICS Model 4864 GPIB Relay Interface.

OVERVIEW

The LabView™ library files ((commonly referred to as drivers) discussed in this note are available from ICS Electronics. These drivers implement many of the commonly used 4864 functions. They can be easily edited to provide additional features not addressed in this preliminary release. With one exception they may all be used as sub-VIs in building your LabView 4864 application. Each sub-VI's function will be addressed in the following pages along with any applicable cautions that may apply to its use. To make best use of these drivers we recommend the user familiarize themselves with the contents of the 4864 Instruction Manual.

We have provided 5 executable files that demonstrate the following capabilities:

- IDN
- Read Digital Inputs
- Discrete Relay Control
- List Relay Control
- Relay Scanner Example

These files are available from our web site. They will run on any Windows PC with LabView or with the LabView Run Time Engine (RTE) installed (also available from our web site), and a GPIB Controller. The GPIB Controller can be a card that installs internally in the PC or a PCMCIA card.

REQUIRED HARDWARE AND SOFTWARE:

- PC running Windows 95/98/ME/2000
- LabView™ Version 5. 1 or Higher
- ICS Electronics 4864 GPIB -Relay Interface
- ICS Electronics GPIB Interface Card (or equivalent)

To run only the demo files you do not need the full version of LabView™. Simply install a copy of the RTE from ICS on your GPIB equipped PC and save the executable files in a convenient location on your hard drive. Note that LabView RTEs only go back 2 generations so users with LabView 6.1 will have to save the demonstration VIs as 6.1 VIs prior to running them.

REFERENCE DOCUMENTS

- ICS Electronics Model 4864 User Manual
- National Instrument LabView Programming Guide.

Note: To simplify application development we intentionally wrote the LabView VIs and Sub-VIs in their simplest form without the VISA layer.

WHAT IS IN THE VIRTUAL INSTRUMENT (VI) LIBRARY

Change_ADDR. VI

Use this VI to change the default address for your 4864 and save the result in flash memory. Do not place this VI in a continuous loop the Flash Update switch enabled. Use this VI when the you want to reassign the 4864's default GPIB address. The same task may also be accomplished using the configuration software supplied with the device.

See the Warning note in the User Manual paragraph 3. 8. 6

Digital_Input_Status. VI

Use this VI to read and display the status of the 8 digital input lines. Run it in a loop to continuously monitor the digital inputs.

IDN. VI

Use this VI to query the 4864's identification message. Table 3-1 of the user manual displays the correct result.

Relay Control. VI

Use this VI for turning On or Off discrete relays. The default state for each relay is Normally Open (NO). To toggle a relay On select the desired relay on the thumb wheel switch, move the toggle switch Up, and run the VI. Similarly to turn it off move the toggle switch down and run the VI again. This VI can be used multiple times in your application to address multiple relays.

Relay List Control. VI

Use this VI to control multiple relays via the list command. Toggling each relay On or Off is done the same way as in the Relay Control VI described above.

Relay Scanner Example. VI

This VI implements the User Manual example shown in paragraph 3. 8. 2. It demonstrates the 4864's ability to function as a channel scanner. For this example we use three relays in a two pole scan mode. The dwell time control allows the user to set the approximate amount of time each relay pair is On before scanning to the next pair. Run this in a loop to continuously scan the selected relays. The relay status indicator shows the active pairs. Add more relays by simply entering them into the channel lists. This VI is for demonstration purposes. It is not wired as a sub-VI.

ICS 4864 Wait. VI

Use this sub-VI after every GPIB command to allow the bus a chance to respond to each command or query. The default is arbitrarily set for 150 ms. It can be set for shorter delays if timing is important to your application.

Open All Relays. VI

Use this building block VI to force all relays to their NO position.

Relay Status?

Use this VI to con •rm the current status of all relay channels.

SUMMARY

This application note has described a collection of LabView™ VIs that can be used to control an ICS Model 4864 GPIB Relay Interface. The user can intersperse these VIs in his or her program as needed to make a complete test program. The subject LabView VIs and the revision 5.1 Run Time Engine can be downloaded from the Support Menu on ICS Electronics' website at <http://www.icselect.com/>. Look for the 4864_labview.zip file.