

IEEE 488/GPIB BUS SOFTWARE

NOTE: The examples shown in this document are for illustration purposes only. They do not represent the correct setup or configuration for TestEquity chambers. Sample programs from ICS may change critical setup parameters, resulting in improper chamber operation. They are provided as a guideline for how to write your own programs only. Correct setup parameters are documented in the TestEquity manual.

48x9 LABVIEW DRIVER

DESCRIPTION

ICS's 48x9 LabVIEW F4 Temperature Controller Driver provides an easy way to add temperature control capability to any LabVIEW™ program. The F4 Temperature Controller Driver is a Library with Virtual Instruments (VIs) that are specifically tailored to work with any of ICS's 48x9 series GPIB-to-Modbus Controllers and the Watlow™ F4 Temperature Controller. The VIs are written in LabVIEW version 5.1 and can be incorporated in test programs developed by LabVIEW versions 5.1 and 6.i. The VI's in ICS's F4 Temperature Controller Driver save many hours of program development time and greatly reduce the cost of adding temperature control to LabVIEW test programs. Uses include test, certification and process control applications that need to control a temperature chamber with a Watlow F4 controller.

Library Contents

The 48x9 LabVIEW F4 Temperature Controller Library contains the following top VIs:

Simple_Setpoint_OnOff.vi
Single_Ramp_Demo.vi
Static_Setpoint.vi

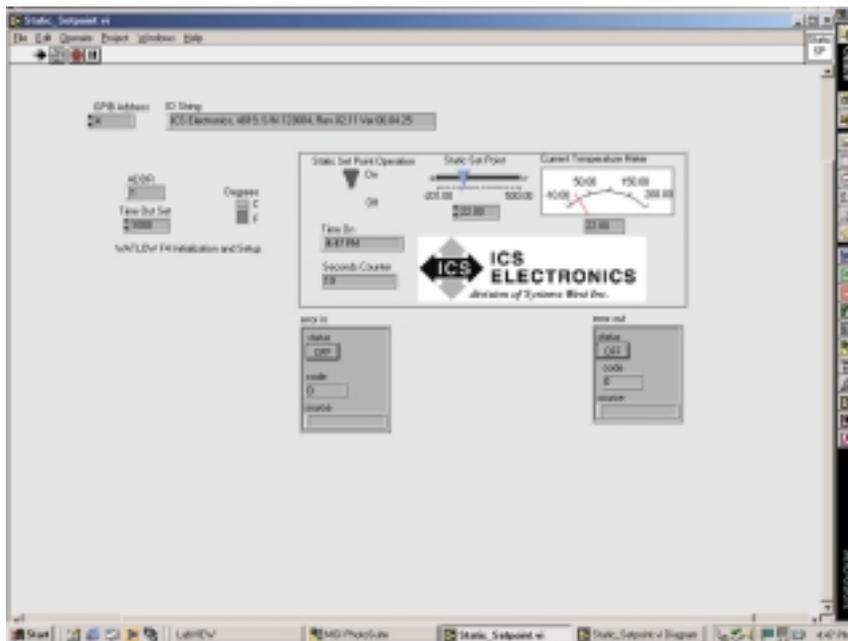
The Simple_Setpoint_OnOff.vi is the major temperature control VI. It commands the Watlow (and thus the temperature chamber) to go to the set temperature. The Ramp_Segment.vi is similar except it changes the temperature over a preset time duration. The Ramp_Segment.vi has two graphs that display the programmed ramp and the actual vs commanded temperature.

Demonstration VIs

The 48x9 LabVIEW F4 Temperature Controller Library includes three demonstration VIs that show how the sub-VIs are connected together to control the temperature chamber.

The easy way to add Temperature Control to your LabVIEW program

- Library VIs work with any ICS Modbus Controller and the Watlow F4 Controller. *Use with ICS Models 4809, 4819 or 4899.*
- Includes twelve sub-VIs that handle the most common F4 temperature control functions. *A complete library package.*
- Tested demonstration VIs simplify LabVIEW program development by showing typical VI connections. *Saves many hours of program development time.*
- Driver written in LabVIEW version 5.1. *Can be used with LabVIEW versions 5.1 and 6.i.*
- 0.1 degree resolution *Smoother ramp performance.*
- Download Static_Setpoint demo VI from ICS's website at <http://www.icselect.com> *Quick trial demonstrates the Library's capabilities.*



Static_SetPoint.vi Front Panel

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48X9 LABVIEW DRIVER: DESCRIPTION Continued

The `Static_Setpoint.vi` initializes the 48x9 Interface and the F4, sets the temperature units as °C or °F. The user sets the desired temperature by either moving a pointer, by clicking up/down arrows or by direct entry. He then positions the Run/Stop switch to Run. When running, the VI commands the Watlow to the set temperature value. When the VI Run/Stop switch is set to Stop, the VI commands the F4 to turn off the setpoint function. The `Static_Setpoint.vi` loops on the temperature setting. An exe version of the `Static_Setpoint.vi` is available on ICS's website to demonstrate the F4 Temperature Controller Library capabilities.

The `Single_Ramp_Demo.vi` starts with the default GPIB address, F4 timeout, temperature units. The user selects minutes or seconds for ramp time and keys in the start temperature, stop temperature and the ramp duration. When the program runs, it displays the profile and the current temperature vs the commanded value on an auto scaling graph. The temperature setpoint is updated once a minute or second to 0.1 degrees. The program stops at the end of the duration period and leaves the F4 setpoint holding the chamber at the last commanded setting.

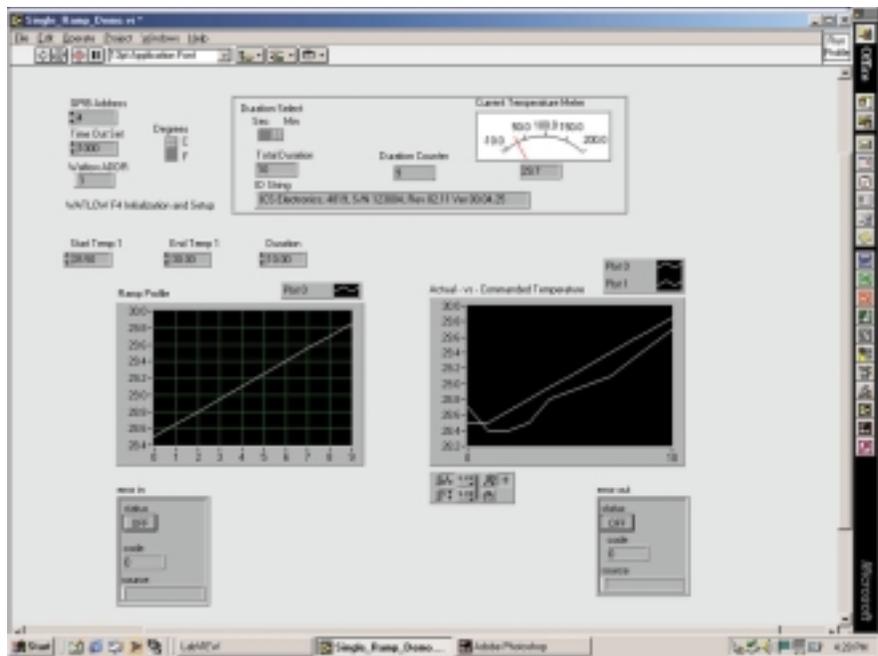
Creating the Application Program

The user connects the initialization VIs as shown in the demo vi to enter the 48x9's GPIB address, to confirm presence of the 48x9 and to initialize the Watlow F4 Controller. Use the 1000 ms timeout value until your program is fully debugged. The `Degrees_C_F.vi` selects degrees Centigrade or degrees Fahrenheit as the temperature units. Insert other initialization and/or test VIs as needed.

Use either the `Static_SP1.vi` or the `Ramp_Segment.vi` to set the chamber temperature at the appropriate place in your program. At the start of the

first `Ramp_Segment.vi`, use the `Read_Current_Temp.vi` to measure the current chamber temperature and establish the starting temperature value. Enter the end temperature, set the time units and enter the ramp duration in minutes or seconds. The `Ramp_Segment.vi` finishes at the end of the ramp duration time.

Insert test functions, soak delays and additional `Ramp_Segment` or `Static_SP1` VIs as necessary to complete the application program. After the last test, use the `SP1_Off.vi` to turn off the F4 setpoint function and thus turn off the temperature chamber.



Single_Ramp_Demo.vi Front Panel

48X9 LABVIEW DRIVER: SPECIFICATIONS

Required Computer and Software

Intel Pentium or equivalent processor with Windows 95/98/2000 or NT operating system. User should have LabView version 5.1 or version 6.i.

Top level VIs:

`Simple_Setpoint_OnOff.vi`
`Single_Ramp_Demo.vi`
`Static_Setpoint.vi`

Sub-VIs

`Degrees_C_F.vi`
`ICS 4861 Wait.vi`
`Init.vi`
`Ramp_Segment.vi`
`Read_Current_Temp.vi`
`Read_Current_Temp_mod.vi`
`SP1_CMD.vi`
`SP1_Off.vi`
`SP1_On.vi`
`Static_SP1.vi`
`Wait.vi`

Deliverable Items

3.5 inch disk with:
Watlow_F4.lib file
Readme file

LabVIEW is a trademark of National Instruments, Austin, TX
Watlow is a trademark of Watlow Controls, Winona, MN

ORDERING INFORMATION

48x9 LabView F4 Temperature Control Driver Library

Part Number

123165