

48x9 LABVIEW DRIVER

DESCRIPTION

ICS's 48x9 LabVIEW F4 Temperature Controller Libraries provide an easy way to add temperature control capability to any LabVIEW™ program. The Libraries include 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

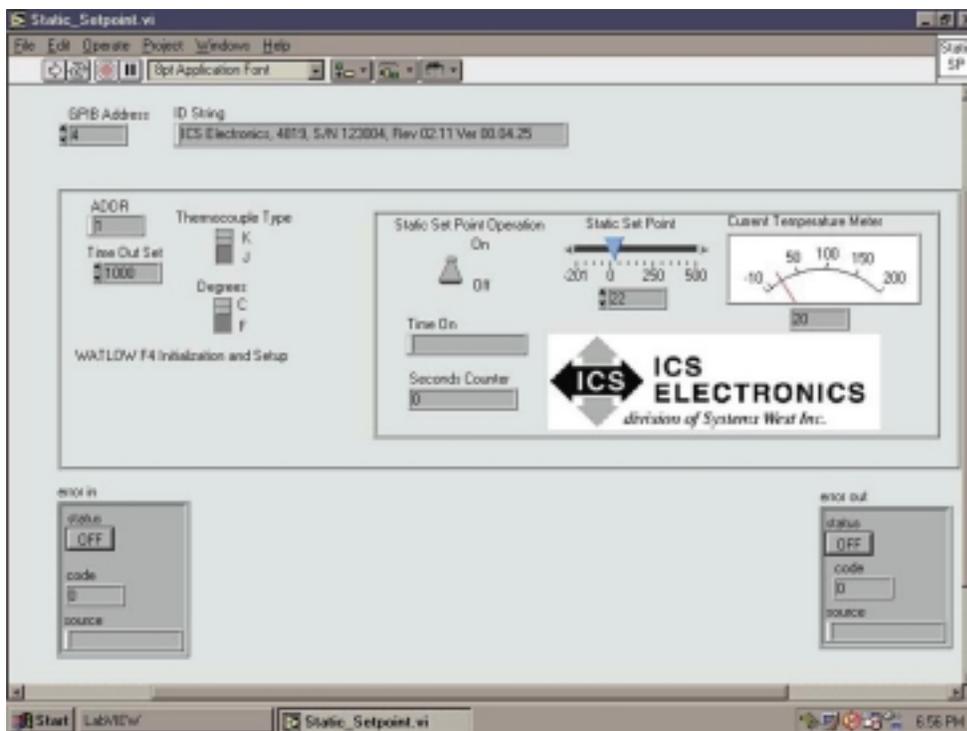
The Simple_Setpoint_OnOff.vi is the major temperature control VI. It commands the Watlow (and thus the temperature chamber) to go to the set temperature. The Ramp_Segment.vi is similar except it changes the temperature over a preset time duration.

Demonstration VIs

The 48x9 LabVIEW F4 Temperature Controller Library includes two demonstration VIs that show how the subVIs 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 seven subVIs 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.*
- 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



7034 Commerce Circle
Pleasanton, CA 94588
► Phone: 925.416.1000
Fax: 925.416.0105
Web: www.icselect.com

48X9 LABVIEW DRIVER: DESCRIPTION Continued

The `Static_Setpoint.vi` initializes the 48x9 Interface and the F4, sets the thermocouple type and sets the temperature units. 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. An exe version of the `Static_Setpoint.vi` is available on ICS's website to demonstrate the F4 Temperature Controller Library functions.

The `Single_Ramp_Demo.vi` uses the default GPIB address, F4 timeout, thermocouple type and 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, the current temperature and the commanded value. The program stops at the end of the duration period and leaves the F4 setpoint holding the chamber at the last commanded setting.

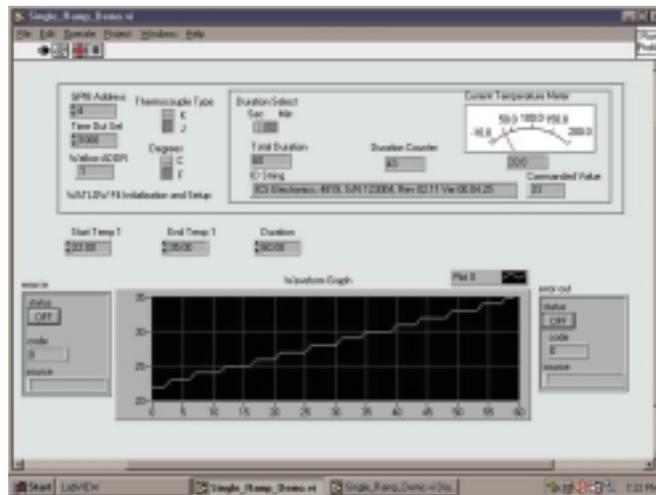
Creating the Application Program

The user should connect the initialization VIs as shown in the demo vi to enter the 48x9's GPIB address 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. The `TC_Type.vi` selects a type J or type K thermocouple. The VI can be easily modified for selecting other sensors by substituting the appropriate value in the VI. Refer to the Watlow F4 Instruction Manual for other sensor selection values.

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 98 or later operating system. User should have LabView version 5.1 or version 6.i.

Included VIs

Top level VIs:
Simple_Setpoint_OnOff.vi
Single_Ramp_Demo.vi
Static_Setpoint.vi
SubVIs
Degrees_C_F.vi
ICS 4861 Wait.vi
Init.vi
Ramp_Segment.vi
Read_Current_Temp.vi
SP1_CMD.vi
SP1_Off.vi
SP1_On.vi
Static_SP1.vi
TC_Type.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