

Thermotron 8800-8200 Controller VI Manual

Introduction:

This instrument driver provides programming support for Thermotron 8800-8200 Controller. It contains functions for opening, configuring, taking measurements from, and closing the instrument using 32 bit LabVIEW virtual instruments.

Assumptions:

To successfully use this module, the following conditions must be met:

For GPIB instrument drivers:

- the instrument is connected to the GPIB.
- the GPIB address supplied to the initialize function must match the GPIB address of the instrument.

For TCP/IP instrument drivers:

- the instrument is connected to the network through the ethernet cable
- the IP address and port number supplied to the initialize function must match the IP address and port number of the instrument.

For RS-232 instrument drivers:

- the instrument is connected to the RS-232 interface.
 - the COM port, baud rate, parity, and timeout supplied to the initialize function must match the settings of the instrument.
-

VI Installation

To install the TH8800-8200 VI Library:

1. Once the folder is extracted choose the correct folder depending on which version of LabVIEW you are using.
2. Place the entire 'TH8800-8200' driver folder into C:\Program Files (x86)\National Instruments\LabVIEWx.x\instr.lib where "LabVIEWx.x" refers to the version of LabVIEW that you are using.

Error and Status Information:

Each function in this instrument driver returns a status code that either indicates success or describes an error or warning condition. Your program should examine the status code from each call to an instrument driver function to determine if an error occurred. The general meaning of the status code is as follows:

Value	Meaning
0	Success
Any Value	Warning/Error

Status Description

0 No error (the call was successful).
BFFA0001 Instrument error. Call TH8800_error_query.
BFFA000C Invalid attribute.
BFFA000D Attribute is not writable.
BFFA000E Attribute is not readable.
BFFA000F Invalid parameter.
BFFA0010 Invalid value.
BFFA0012 Attribute not supported.
BFFA0013 Value not supported.
BFFA0014 Invalid type.
BFFA0015 Types do not match.
BFFA0016 Attribute already has a value waiting to be updated.
BFFA0018 Not a valid configuration.
BFFA0019 Requested item does not exist or value not available.
BFFA001A Requested attribute value not known.
BFFA001B No range table.
BFFA001C Range table is invalid.
BFFA001F No channel table has been built for the session.
BFFA0020 Channel name specified is not valid.
BFFA0044 Channel name required.
BFFA0045 Channel name not allowed.
BFFA0046 Attribute not valid for channel.
BFFA0047 Attribute must be channel based.
BFFF0000 Miscellaneous or system error occurred.
BFFF000E Invalid session handle.
BFFF0015 Timeout occurred before operation could complete.
BFFF0034 Violation of raw write protocol occurred.
BFFF0035 Violation of raw read protocol occurred.
BFFF0036 Device reported an output protocol error.
BFFF0037 Device reported an input protocol error.
BFFF0038 Bus error occurred during transfer.
BFFF003A Invalid setup (attributes are not consistent).
BFFF005F A "no listeners" condition was detected.
BFFF0060 This interface is not the controller-in-charge.
BFFF0067 Operation is not supported on this session.
3FFF0085 The status value you passed is unknown.

Data Types

Integer: The data consists of an ASCII sign character (+ or -) followed by ASCII decimal digits representing an integer number, for example an interval number or the number of loops left in an interval.

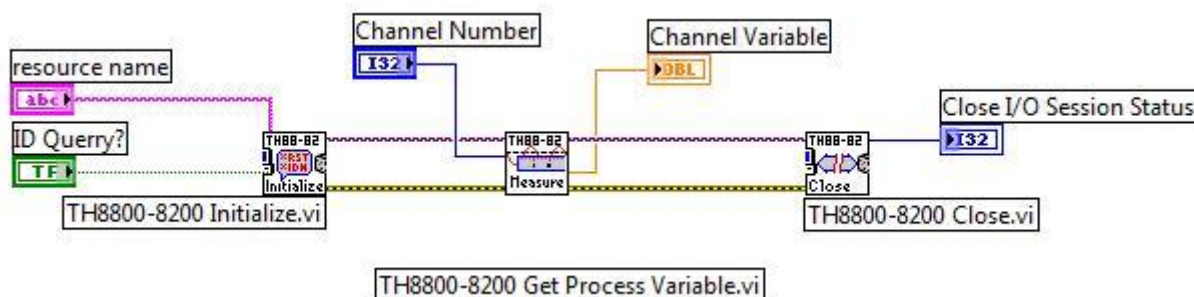
Coded Integer: A coded integer is a decimal integer that displays the sum of a binary weighted code. The number of ASCII digits vary with each command type. Each bit in the original code is assigned a binary weight (1, 2, 4, 8, 16, 32, 64, or 128). The integer sent is the decimal sum of the coded bits that are enabled, for example the 8200's response to an OPTN? or AUXE? command.

Decimal: The data consists of an ASCII sign character (+ or -) followed by ASCII decimal digits, decimal point, and the number of digits needed for the selected resolution, for example the setpoint of a temperature channel.

String: The data consists of a string of ASCII characters. The information and format varies between commands and are defined at each command description.

TH8800-8200 example VI Structure

This is an example of a VI structure that can be applied to all of the functions listed. It is important to the operation of the VI that it starts with the Initialize and ends with Close. Also it is necessary for the instrument handle, and error in/out to be connected between each function for proper operation.



Command Name: TH8800-8200 Get Alarm Status

Command Type: System Status

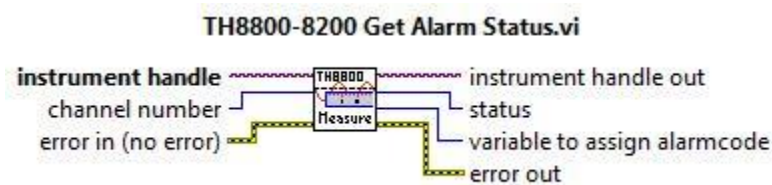
Description:

This command will return the current alarm status for the channel that is selected. The alarm status is a single coded integer that defines the error as listed below.

Bit #	Definition
0	Low deviation alarm
1	High deviation alarm
2	Not used
3	Not used

Bit #	Definition
4	Low process alarm
5	High process alarm
6	Not used
7	Not used

VI:



Data Type: Coded Integer

Example Request: Channel 1

Example Response: 2 or 00000010 (This indicates that the High deviation alarm is on.)

Command Name: TH8800-8200 Get Auxiliary Enabled

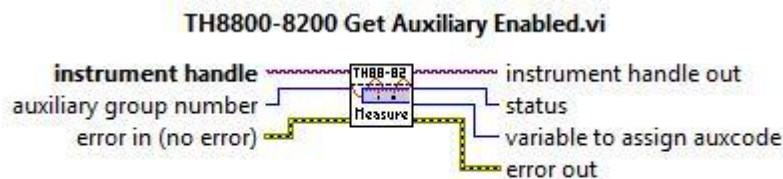
Command Type: Variable; Edit from hold

Description:

This command returns what auxiliary channels are enabled on auxiliary group 1 or 2. If group 1 requested that state of channels 1-8 are given and if group 2 is requested the status of 9-16 is given. The command must be sent when the controller is in run manual mode or edit from hold operation. The Response is a three-digit one byte-coded integer with the following representation.

1 = AUX 1 or 9	16 = AUX 5 or 13
2 = AUX 2 or 10	32 = AUX 6 or 14
4 = AUX 3 or 11	64 = AUX 7 or 15
8 = AUX 4 or 12	128 = AUX 8 or 16

VI:



This function gets the Auxiliaries enabled for the selected group.

Data Type: Coded Integer

Example Request: Group 1

Example Response: 52 (This indicates that AUX 3, 5, and 6 are enabled.)

Command Name: TH8800-8200 Set Auxiliary Enabled

Command Type: Variable; Edit from hold

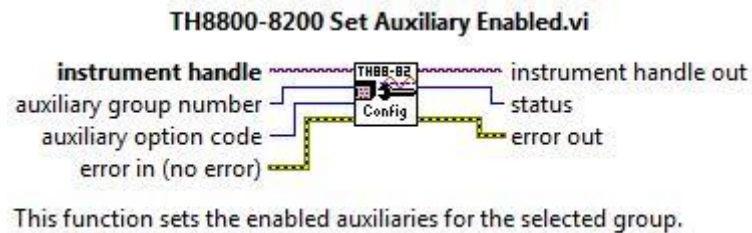
Description:

This command sets the auxiliary channels to be active that corresponds to the group number and the three-digit one-byte coded integer. The command must be sent when the controller is in run manual mode and/ or edit from hold operation.

1 = AUX 1 or 9
2 = AUX 2 or 10
4 = AUX 3 or 11
8 = AUX 4 or 12

16 = AUX 5 or 13
32 = AUX 6 or 14
64 = AUX 7 or 15
128 = AUX 8 or 16

VI:



Data Type: Coded Integer

Example Request: Auxiliary group number 2 auxiliary option code 15.

Example Response: 0 (Auxiliary channels 9, 10, 11, and 12 are enabled; if channels 13, 14, 15, or 16 are on they are turned off.)

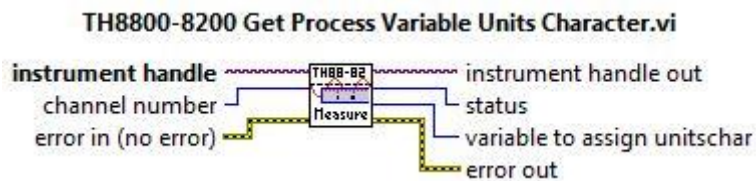
Command Name: TH8800-8200 Get Process Variable Units Character

Command Type: Variable; Edit from hold

Description:

This command returns the unit character of the channel requested in C (Celsius), F (Fahrenheit), % (percent relative humidity), or T (torr). The requested channel can be any number between 1 and 16 where 1-8 are process variable channels and 9-16 are monitor channels 1-8 respectively.

VI:



Data Type: ASCII unit character

Example Request: Channel 3

Example Response: % (Channel 3 is programmed in percent relative humidity)

Command Name: TH8800-8200 Get Channel Configuration

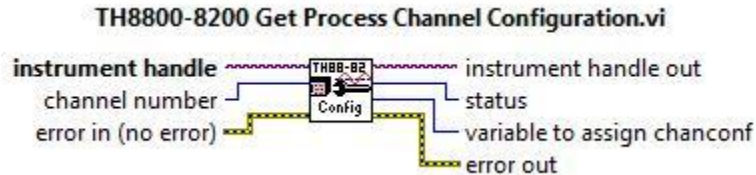
Command Type: System Status

Description:

This command returns a single coded integer, which describes the channel type when a channel number is given. The representations of each integer are as follows.

- 0 = Channel not used
- 1 = Percent relative humidity channel using a wet bulb/dry bulb thermocouple pair
- 2 = Temperature channel using a thermocouple
- 3 = Linear channel using a programmable range (for example altitude)
- 4 = Linear 0% to 100% relative humidity channel using a solid-state sensor
- 5 = Product temperature control channel

VI:



Data Type: Coded Integer

Example Request: Channel 3 (Any channel 1-8)

Example Response: 2 (Temperature channel using a thermocouple)

Command Name: TH8800-8200 Get Channel Status

Command Type: System Status

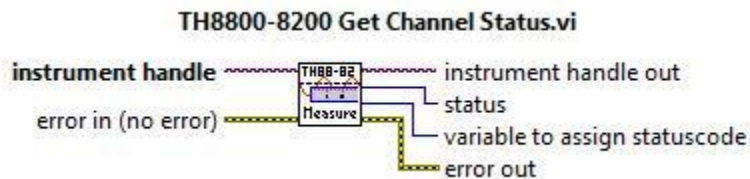
Description:

This command returns a two-byte coded integer describing the channel on and configuration status.

Byte1: Bits 0-7 represent the on status of channels 1-8 respectively. A 1 represents that it is on and a 0 the opposite.

Byte 2: Bits 8-15 represent the configured status of channels 1-8 respectively. A 1 represents a configured channel and a 0 the opposite.

VI:



Data Type: Coded Integer

Example Request: NA

Example Response: 769 or 00000011 00000001 (This indicates that channels 1 and 2 are configured and that channel 1 is on.)

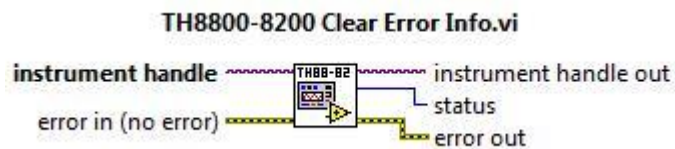
Command Name: TH8800-8200 Clear Error Info

Command Type: System Status

Description:

This command clears the error info for the current execution thread. If you pass a VI_null for the instrument handle parameter, this function clears the error information only for the current execution string. The error information includes a primary error code, a secondary error code, and an error elaboration string.

VI:



Data Type: NA

Example Request: NA

Example Response: 0 (Error info was successfully cleared)

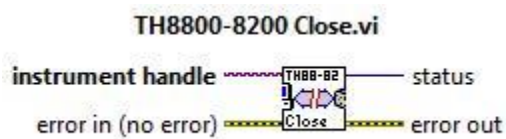
Command Name: TH8800-8200 Close

Command Type: System Status

Description:

This command closes the I/O session that is currently in progress along with the de-allocation of any memory used for drivers.

VI:



Data Type: NA

Example Request: NA

Example Response: 0 (Closing of current I/O session successful)

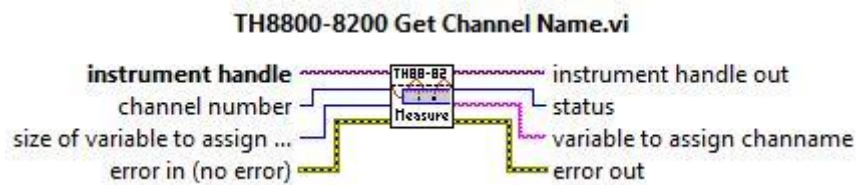
Command Name: TH8800-8200 Get Channel Name

Command Type: System Status

Description:

This command returns the name of any process variable or monitor channel that you request. Where channel numbers 1-12 are process variable channels and 13-28 are monitor channels.

VI:



Data Type: ASCII unit character

Example Request: Channel 4

Example Response: Temp Ext.

Command Name: TH8800-8200 Get Configuration Options

Command Type: System Status

Description:

This command returns three coded-integer bytes. These values indicate all the system options selected at the factory for the controller. The values are represented below.

Byte 1 (Bits 0 through 7)

1 = Product temperature control
2 = Humidity system
4 = Low humidity system
8 = -Altitude
16 = Purge
32 = Cascade refrigeration system
64 = Power Save mode
Bit 7 (128) is not used

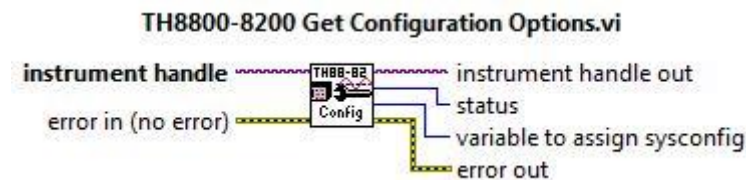
Byte 2 (Bits 8 through 15)

1 = Transducers installed
Bits 9 through 15 are not used

Byte 3 (Bits 16 through 23)

1 = Chamber control
2 = SPD SE chamber control
4 = System Monitor functions
8 = Stop mode on System Monitor trips
Bits 20 through 23 are not used

VI:



Data Type: Three bytes of coded integer

Example Request: NA

Example Response: 327987 (Binary value 00000101,00000001,00110011. This indicates that the controller is configured for product temperature control, humidity, purge, and cascade refrigeration, refrigeration transducers are installed, the controller is configured for chamber control, and the System Monitor is enabled.)

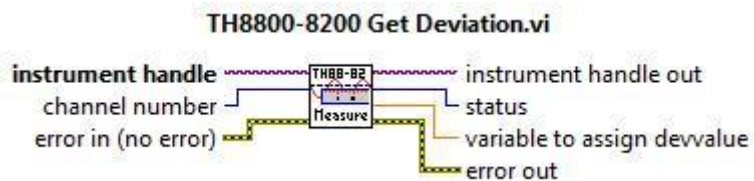
Command Name: TH8800-8200 Get Deviation

Command Type: Variable; Edit from hold

Description:

This command returns the value of the deviation for the selected channel (Channel 1-4).

VI:



Data Type: Decimal

Example Request: Channel 1

Example Response: 2.3

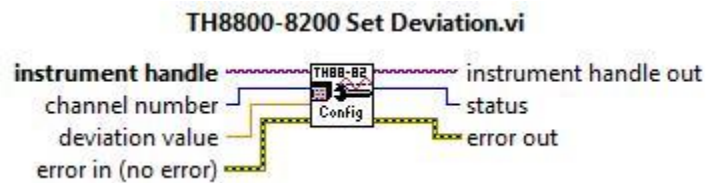
Command Name: TH8800-8200 Set Deviation

Command Type: Variable; Edit from hold

Description:

This command loads a deviation setting into the channel (Channels 1-4) selected for the current manual mode or sends a temporary value during an edit from hold operation.

VI:



Data Type: Decimal

Example Request: Channel 2, Deviation 4.2

Example Response: 0 (If the controller is manual mode, it loads a deviation value of 4.2 into channel 2.)

Command Name: TH8800-8200 Get Program Directory

Command Type: Programming Command

Description:

This command queries a specific directory on the controller for a list of program files and directories. If the name listed is a file it will be followed by a positive number that indicates the number of intervals. If the name is a directory a -2 will follow it. Once you reach the end of all the files and directories the message "No More Files" followed by -1.

VI:



Data Type: ASCII unit characters

Example Request: No file or directory name

Example Response: Heat Test, 7

Example Request: No file or directory name

Example Response: Program Files, -2

Example Request: Program Files

Example Response: Cold Test, 4

Example Request: Program Files

Example Response: No More Files, -1

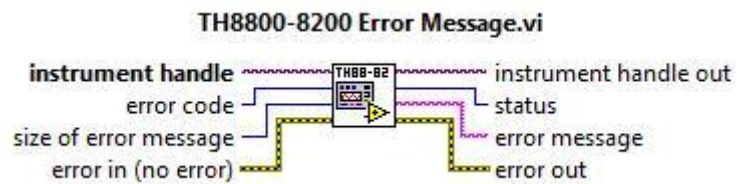
Command Name: TH8800-8200 Error Message

Command Type: System Status

Description:

This command converts a status code returned from an instrument driver function into a user readable string.

VI:



Data Type: String

Example Request: BFFA000F

Example Response: Invalid parameter

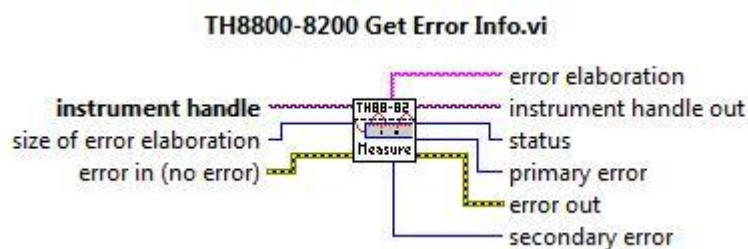
Command Name: TH8800-8200 Get Error Info

Command Type: System Status

Description:

This command returns the error information associated with the IVI session or with the current execution thread. If you specify a valid IV session for the instrument handle parameter, this function retrieves and then clears the error information for this session. If you pass VI_null for the instrument handle, this function retrieves and then clears the error information for the current execution thread.

VI:



Data Type: String

Example Request: NA

Example Response: Invalid parameter, BFFA000F

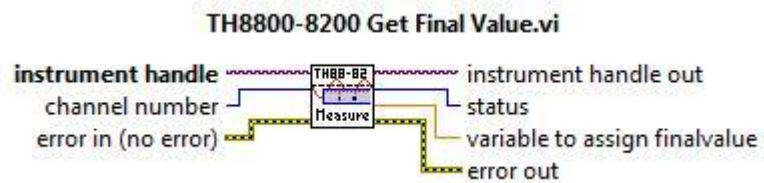
Command Name: TH8800-8200 Get Final Value

Command Type: Program status; Edit from hold

Description:

This command returns the controllers current interval's final value for channel 1 to 4.

VI:



Data Type: Decimal

Example Request: Channel 2

Example Response: 25 (The final value of channel 2 on the current program on the current interval is 25 units)

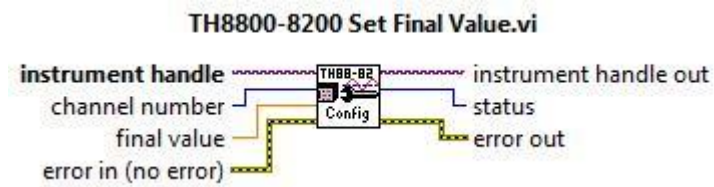
Command Name: TH8800-8200 Set Final Value

Command Type: Program status; Edit from hold

Description:

This command sets the controllers current interval's final value for channel 1 to 4.

VI:



Data Type: Decimal

Example Request: Channel 2, 40

Example Response: 0 (The final value of channel 2 on the current program on the current interval is 40 units)

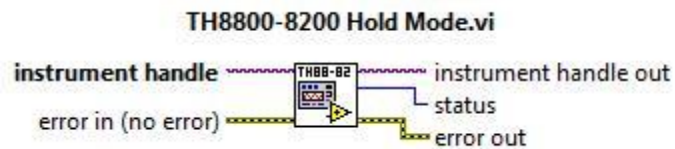
Command Name: TH8800-8200 Hold Mode

Command Type: Control

Description:

This command places a running program or test in hold mode.

VI:



Data Type: No Data

Example Request: NA

Example Response: 0 (The controller/program in placed in hold mode.)

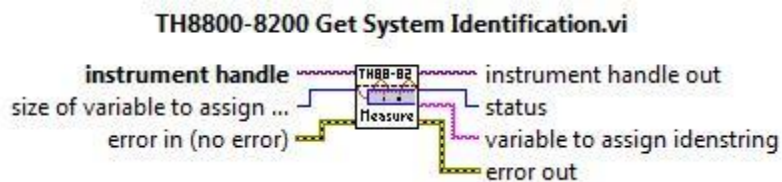
Command Name: TH8800-8200 Get System Identification

Command Type: System Status

Description:

This command returns an ASCII character string to the host computer.

VI:



Data Type: ASCII character string

Example Request: NA

Example Response: 8X00 Chamber Controller

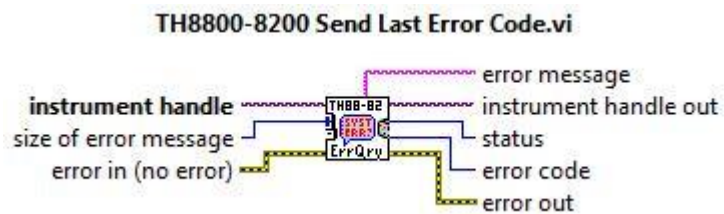
Command Name: TH8800-8200 Send Last Error Code

Command Type: System Status

Description:

This command returns the last error that occurred in the form of an error code and error message. The error code list can be found in either the 8800 or 8200 display manual. After the initial return, the command will return the next most recent error until there are no more, which will be no greater than 8. At the time when the error buffer is empty it will display a 0.

VI:



Data Type: Coded Integer and ASCII String

Example Request: NA

Example Response: 3 (This indicates that the output buffer is full.)

Command Name: TH8800-8200 Initialize

Command Type: Control

Description:

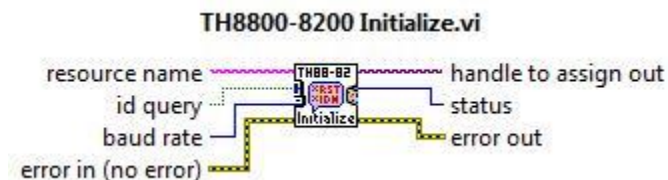
This command creates a new IVI instrument driver session. All other functions must be preceded by this command, however just one Initialize is enough for multiple commands. The Initialize command also allows for multiple types of communication \. The type of communication is selected through the resource name with one of the following syntaxes:

Interface Syntax

GPIOB	GPIOB[board]::<primary address>[::secondary address]::INSTR
VXI	VXI[board]::<logical address>::INSTR
GPIOB-VXI	GPIOB-VXI[board]::<logical address>::INSTR
Serial	ASRL<port>::INSTR
Ethernet	TCPIP[board]::<host address>::<port>::SOCKET

Optional sections are enclosed in square brackets [].

VI:



Data Type: No Data

Example Request: NA

Example Response: NA

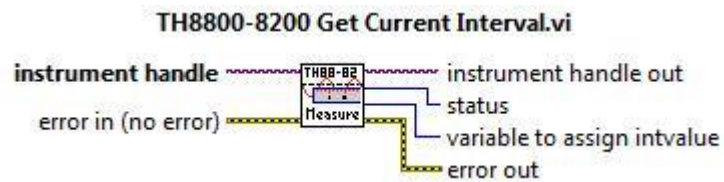
Command Name: TH8800-8200 Get Current Interval

Command Type: Program Status

Description:

This command returns the current interval number.

VI:



Data Type: Integer

Example Request: NA

Example Response: 6 (This indicates that the controller is on interval 6 of the current program)

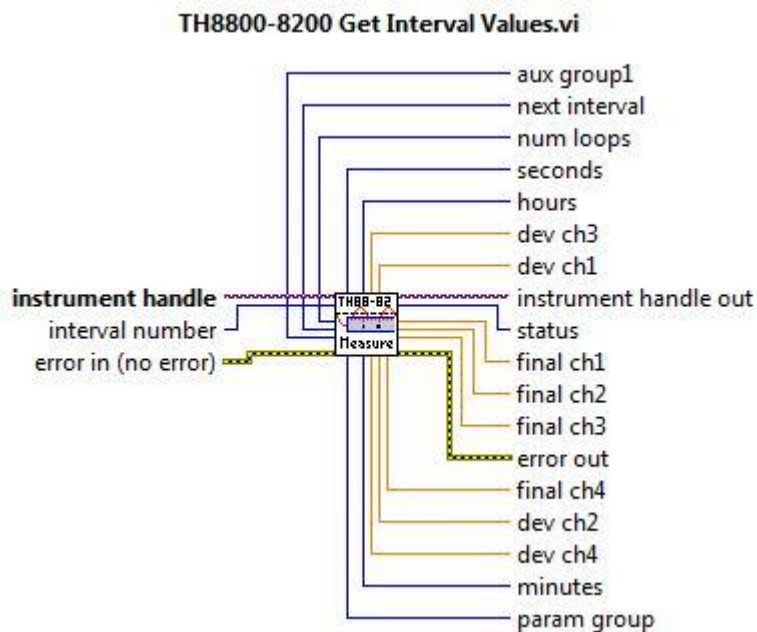
Command Name: TH8800-8200 Get Interval Values

Command Type: Programming

Description:

This command returns the values and settings of the interval requested. Also this command can be used in conjunction with Get Program/Intervals to retrieve a specific interval from a specific program.

VI:



Data Type: Coded integer

Example Request: Interval 22

Example Response:

Interval 22 is programmed as follows:

Final values: Channel 1 = -52 units; channel 2 = -67 units

Deviations: Channel 1 = 3 units, channel 2 = 10 units

Time: 1 hour, 10 minutes

Parameter group: 3

Number of loops: 5

Next interval: 18

Auxiliaries enabled: AUX1-2, AUX1-3, AUX1-4, AUX2-2, AUX2-4, and AUX2-5

Display status enabled: Looping, auxiliaries, deviations, channel 1, channel 2

Options enabled: PTC, purge, cascade refrigeration.

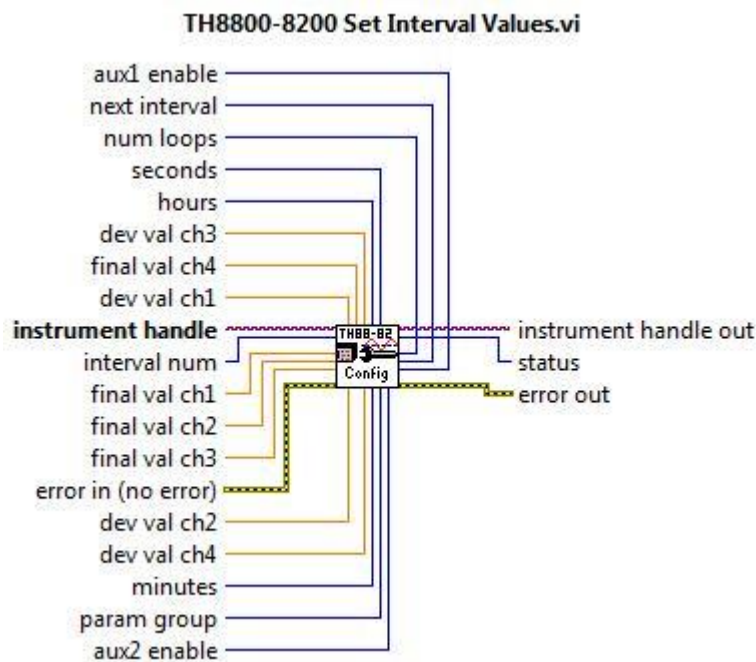
Command Name: TH8800-8200 Set Interval Values

Command Type: Programming

Description:

This command loads predefined conditions for the interval that is specified. Also this command is used with the Set Program/Interval to create a program for the controller.

VI:



Data Type: Coded Integer

Example Request:

Interval 35

Final values: Channel 1 = 75 units; channel 2 = 98 units

Deviations: Channel 1 = 5 units, channel 2 = 8 units

Time: 20 minutes

Parameter group: 1

Number of loops: 20

Next interval: 15

Auxiliaries enabled: AUX1-1, AUX1-2, AUX2-1

Display status enabled: Looping, auxiliaries, deviations, channel 1, channel 2

Options enabled: Humidity, low humidity, purge, single-stage refrigeration

Example Response: 0 (The controller loads the conditions into interval 35)

Get/Set Interval Values Data Types

Interval number: 1 to 300

fv1 ... fv4: decimal values for the channel 1 through channel 4 final values

dv1 ... dv4: decimal values for the channel 1 through channel 4 deviations from set point

hh:mm:ss: hours (0 to 99), minutes (0 to 99), and seconds (0 to 99).

parameter group: 1 to 4

number of loops: 0 to 9999

next interval: 1 to 300

ax1, ax2: auxiliaries enabled in each AUX group. Auxiliary Group 1 refers to auxiliaries 1-8 and Auxiliary Group 2 refers to auxiliaries 9-16. Each value is a three-digit coded integer with the following values:

1 = AUX 1 or 9	16 = AUX 5 or 13
2 = AUX 2 or 10	32 = AUX 6 or 14
4 = AUX 3 or 11	64 = AUX 7 or 15
8 = AUX 4 or 12	128 = AUX 8 or 16

options: The options bytes for the program (0 to 65535). These bytes turn the options on or off. You must turn on the option in order to use its programmed values. For example, to use product temperature control (PTC), you must program the PTC channel and turn the PTC option on. These bytes assign the following weighting values to the options:

1 = Product temperature control

2 = Humidity system

4 = Low humidity system

8 = GSoak

16 = Purge

32 = Cascade refrigeration (SE-Series chambers only)

64 = Power save mode (SE-Series only)

128 = Single-stage refrigeration (SE-Series only)

256 = Rapid cycle operation (AST modules only)

512 = Altitude

NOTE: NEVER assign a PTC channel with a humidity channel.

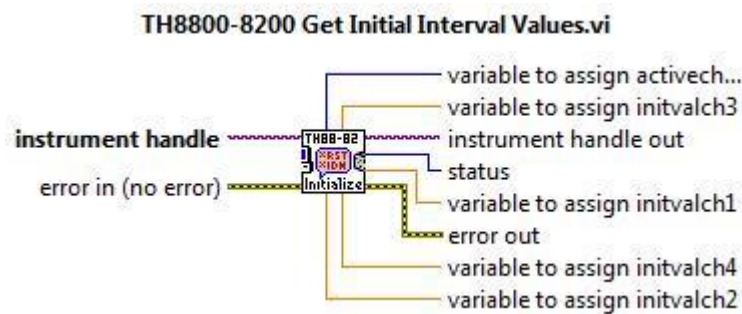
Command Name: TH8800-8200 Get Initial Interval Values

Command Type: Programming

Description:

This command returns conditions of interval zero. The final conditions of interval zero are the initial conditions of interval one. Also when using the Get Program/Interval command this command must be used before the Get Interval Values for interval 1.

VI:



Data Type: Coded Integer

Example Request: Interval 0

Example Response: 30.0, 50.0, 0.0, 0.0,3 (Channel 1 is set to +30 units and channel 2 is set to +50 units; channels 1 and 2 are active.)

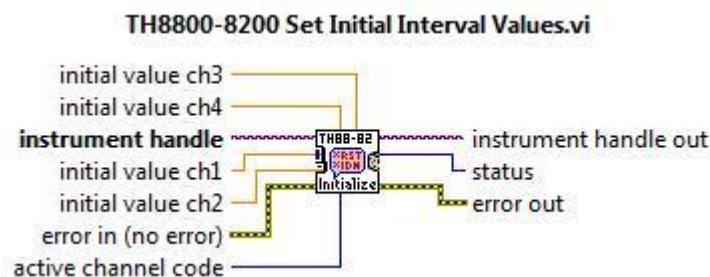
Command Name: TH8800-8200 Set Initial Interval Values

Command Type: Programming

Description:

This command sets the conditions of interval zero. The final conditions of interval zero are the initial conditions of interval one. Also when using the Set Program/Interval command this command must be used before the Set Interval Values for interval 1.

VI:



Data Type: Coded Integer

Example Request: -10.0, 20.0, 0.0, 0.0,3 (Channel 1 is set to -10 units and channel 2 is set to 20 units; channels 1 and 2 are active.)

Example Response: 0 (Initial conditions are set.)

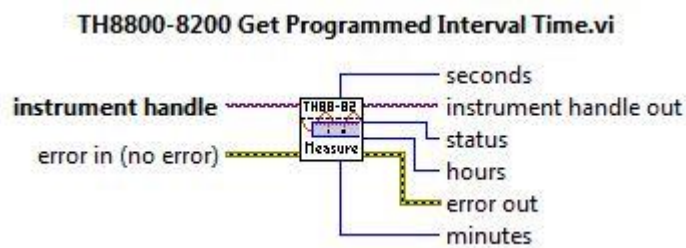
Command Name: TH8800-8200 Get Programmed Interval Time

Command Type: Program Status

Description:

This command returns the amount of time that the current interval is programmed for.

VI:



Data Type: String

Example Request: NA

Example Response: 0 hours, 10 minutes, 30 seconds

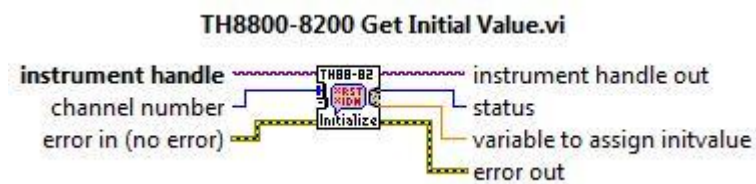
Command Name: TH8800-8200 Get Initial Value

Command Type: System Status

Description:

This command returns the current intervals initial value for the specified channel 1 to 4.

VI:



Data Type: Decimal

Example Request: NA

Example Response: 25

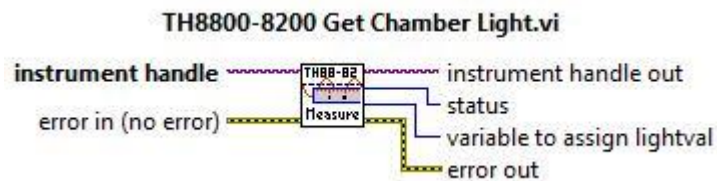
Command Name: TH8800-8200 Get Light Status

Command Type: System Status

Description:

This command returns the current status of the chamber light.

VI:



Data Type: Decimal

Example Request: NA

Example Response: 1 (The light is on.)

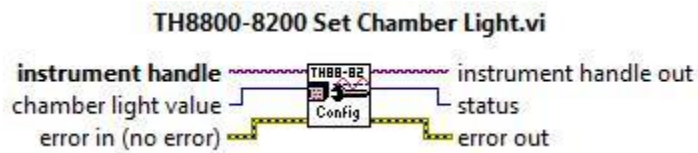
Command Name: TH8800-8200 Set Light Status

Command Type: System Status

Description:

This command sets the status of the chamber light.

VI:



Data Type: Decimal

Example Request: 1

Example Response: 0 (Command was successful and the light is on.)

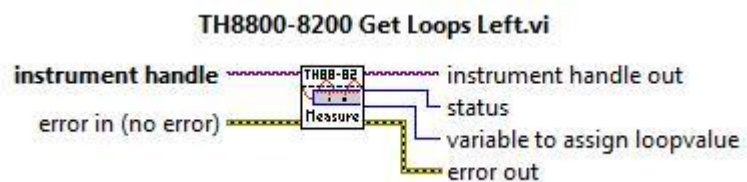
Command Name: TH8800-8200 Get Loops Left

Command Type: Program status; edit from hold

Description:

This command returns the number of loops left to be executed for the current interval.

VI:



Data Type: Integer

Example Request: NA

Example Response: 8 (There are 8 loops left.)

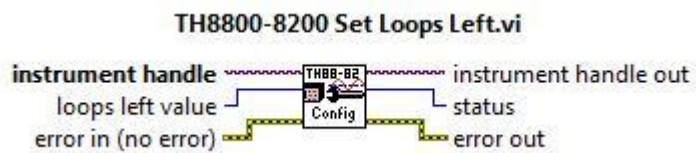
Command Name: TH8800-8200 Set Loops Left

Command Type: Program status; edit from hold

Description:

This command sets the number of loops left to be executed for the current interval.

VI:



Data Type: Integer

Example Request: 12

Example Response: 0 (There are now 12 loops left.)

Command Name: TH8800-8200 Get Access Level

Command Type: System Status

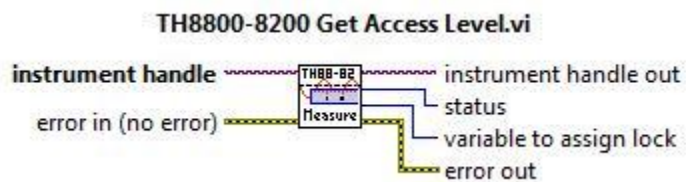
Description:

This command returns the access level of the controller

Access Levels

0 = Locked	3 = Programmer
1 = Level One	4 = Lab Manager
2 = Level Two	5 = Calibration

VI:



Data Type: Coded Integer

Example Request: NA

Example Response: 2 (The access is set to level two.)

Command Name: TH8800-8200 Set Access Level

Command Type: System Status

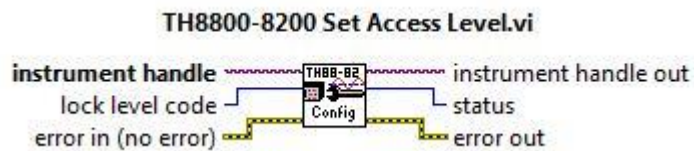
Description:

This command sets the access level of the controller

Access Levels

0 = Locked	3 = Programmer
1 = Level One	4 = Lab Manager
2 = Level Two	5 = Calibration

VI:



Data Type: Coded Integer

Example Request: 5 (Calibration Level)

Example Response: 0 (The access was successfully set to level 5.)

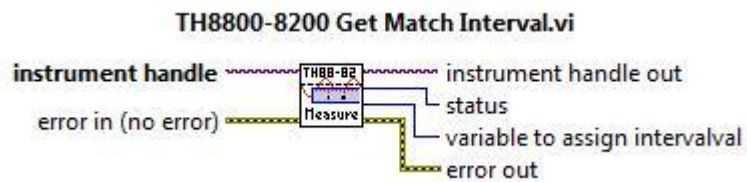
Command Name: TH8800-8200 Get Match Interval

Command Type: System Status

Description:

This command returns the interval number that service request interrupt will occur.

VI:



Data Type: Integer

Example Request: NA

Example Response: 7 (The service request interrupt will start at the beginning of interval 7 when running a program.)

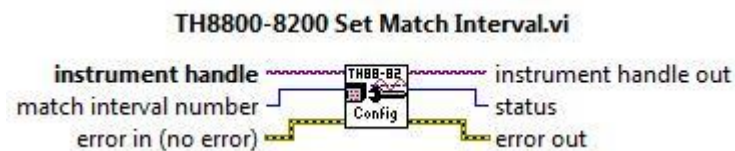
Command Name: TH8800-8200 Set Match Interval

Command Type: System Status

Description:

This command sets the interval number where the service request interrupt will occur.

VI:



Data Type: Integer

Example Request: 3

Example Response: 0 (The service request interrupt will start at the beginning of interval 3 when running a program.)

Command Name: TH8800-8200 Get Operating Mode

Command Type: System Status

Description:

This command returns the controllers current operating mode in the form of a coded integer byte

Bit 0 = Program mode

Bit 4 = Manual mode

Bit 1 = Edit mode (controller in stop mode)

Bit 5 = Delayed start mode

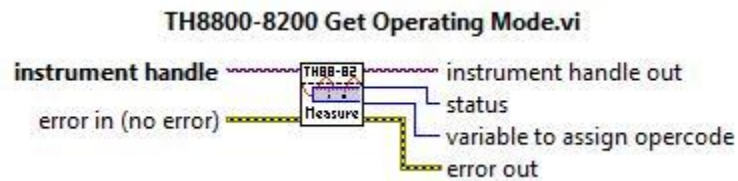
Bit 2 = View program mode

Bit 6 = Unused

Bit 3 = Edit mode (controller in hold mode)

Bit 7 = Calibration mode

VI:



Data Type: Coded Integer

Example Request: NA

Example Response: 0 (This indicates that the controller is in program mode.)

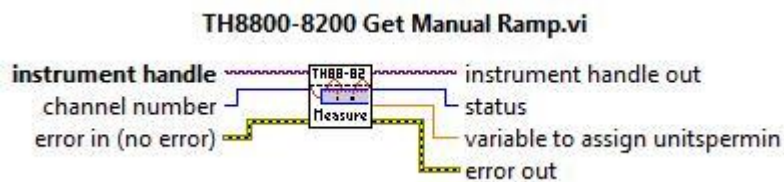
Command Name: TH8800-8200 Get Manual Ramp

Command Type: Variable

Description:

This command returns the ramp rate for the specified channel.

VI:



Data Type: Integer

Example Request: Channel 2

Example Response: 30 (This indicates that the ramp for channel 2 is 30 units per minute.)

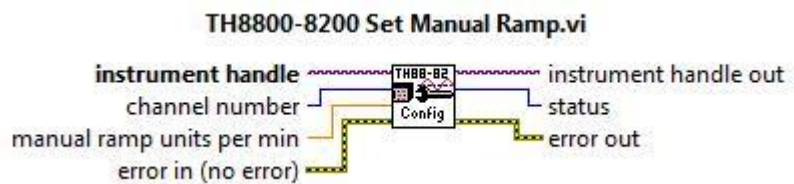
Command Name: TH8800-8200 Set Manual Ramp

Command Type: Variable

Description:

This command sets the ramp rate for the specified channel.

VI:



Data Type: Integer

Example Request: Channel 1, 14

Example Response: 0 (This indicates that the ramp for channel 1 is set to 14 units per minute.)

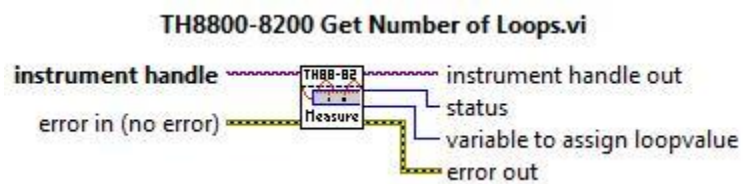
Command Name: TH8800-8200 Get Number of Loops

Command Type: Program Status

Description:

This command returns the number of loops in the current interval.

VI:



Data Type: Integer

Example Request: NA

Example Response: 15 (There are 15 loops in this current interval.)

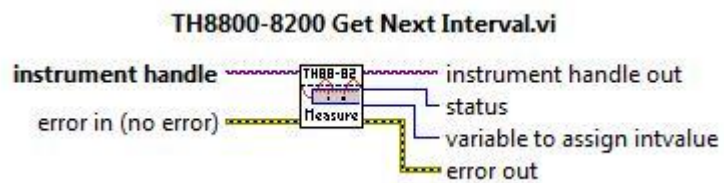
Command Name: TH8800-8200 Get Next Interval

Command Type: Program Status

Description:

This command returns the number of next interval.

VI:



Data Type: Integer

Example Request: NA

Example Response: 5 (The next interval is 5.)

Command Name: TH8800-8200 Get Manual Options

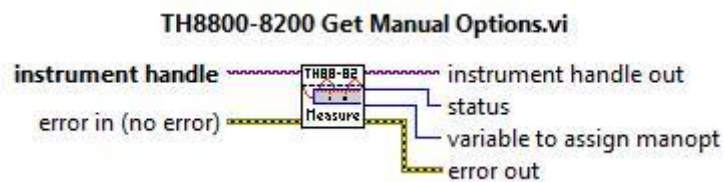
Command Type: Variable

Description:

This command returns a coded integer from the options register that indicate what options are currently enabled. The options are as follows:

- 1 = Product temperature control
- 2 = Humidity system
- 4 = Low humidity system
- 8 = GSoak
- 16 = Purge
- 32 = Cascade refrigeration (SE-Series chambers only)
- 64 = Power save mode (SE-Series only)
- 128 = Single-stage refrigeration (SE-Series only)
- 256 = Rapid cycle operation (AST modules only)
- 512 = Rapid cycle operation (AST modules only)

VI:



Data Type: Coded Integer

Example Request: NA

Example Response: 130 (This indicates that the single-stage refrigeration and humidity options are enabled.)

Command Name: TH8800-8200 Set Manual Options

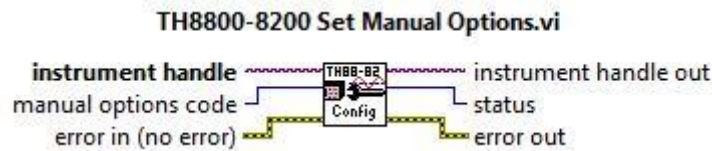
Command Type: Variable

Description:

This command sets a coded integer to the options register that indicates what options are to be enabled. The options are as follows:

- 1 = Product temperature control
- 2 = Humidity system
- 4 = Low humidity system
- 8 = GSoak
- 16 = Purge
- 32 = Cascade refrigeration (SE-Series chambers only)
- 64 = Power save mode (SE-Series only)
- 128 = Single-stage refrigeration (SE-Series only)
- 256 = Rapid cycle operation (AST modules only)
- 512 = Rapid cycle operation (AST modules only)

VI:



Data Type: Coded Integer

Example Request: 50

Example Response: 0 (This command sets the 8800 manual mode options to enable humidity, purge, and cascade refrigeration.)

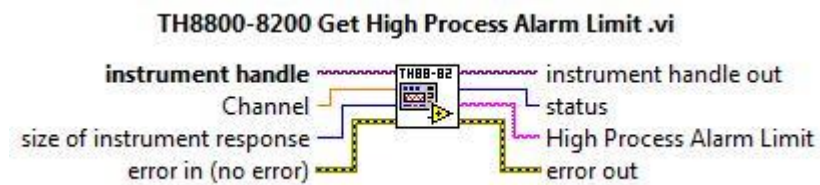
Command Name: TH8800-8200 Get High Process Alarm Limit

Command Type: Program Status

Description:

This command returns the high process alarm limit for the Thermalarm for a specific channel.

VI:



Data Type: Integer

Example Request: Channel 1

Example Response: 100 (This indicates that channel 1 has high process alarm limit of 100.)

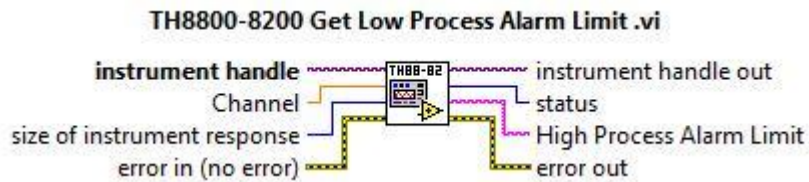
Command Name: TH8800-8200 Get Low Process Alarm Limit

Command Type: Program Status

Description:

This command returns the low process alarm limit for the Thermalarm for a specific channel.

VI:



Data Type: Integer

Example Request: Channel 1

Example Response: -100 (This indicates that channel 1 has low process alarm limit of -100.)

Command Name: TH8800-8200 Get Parameter Values

Command Type: Variable

Description:

This command returns the tuning parameters for a specified control channel and parameter group number.

Non-PTC Operation:

Control Channel numbers (1-4)

Parameter Group numbers (1-4)

Heat and Cool proportion bands (0.0 – 9999.0)

Heat and Cool integral time (0 to 1000 seconds)

Heat throttle limit (0.0 to 100.0)

Cool throttle limit (-100.0 to 0.0)

PTC Operation:

Control channel number (1-4)

Parameter group number (1-4)

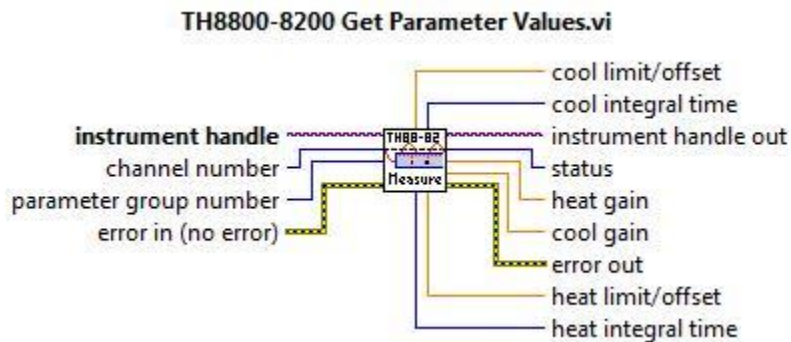
Heat and Cool gain settings for PTC operations (0.0 – 9999.0)

Heat and Cool integral time (0 to 1000 seconds)

Heat offset (0.0 to 100.0)

Cool offset (-100.0 to 0.0)

VI:



Data Type: Integer

Example Request: Channel 2, Parameter Group 2

Example Response: -35.0,35.0,200,200,100.0,-100.0 (These values are the parameter settings for channel 2 in parameter group 3.)

Command Name: TH8800-8200 Set Parameter Values

Command Type: Variable

Description:

This command sets the tuning parameters for a specified control channel and parameter group number. Settings may be loaded on any mode.

Non-PTC Operation:

Control Channel numbers (1-4)

Parameter Group numbers (1-4)

Heat and Cool proportion bands (0.0 – 9999.0)

Heat and Cool integral time (0 to 1000 seconds)

Heat throttle limit (0.0 to 100.0)

Cool throttle limit (-100.0 to 0.0)

PTC Operation:

Control channel number (1-4)

Parameter group number (1-4)

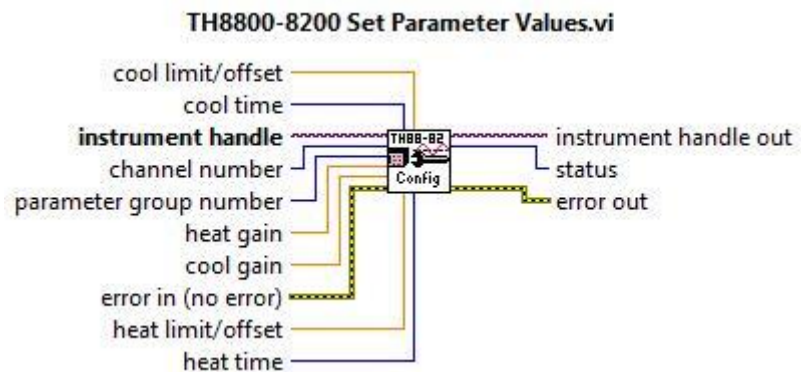
Heat and Cool gain settings for PTC operations (0.0 – 9999.0)

Heat and Cool integral time (0 to 1000 seconds)

Heat offset (0.0 to 100.0)

Cool offset (-100.0 to 0.0)

VI:



Data Type: Integer

Example Request: Channel 1, Parameter Group 2, Heat Proportion Band 100, Cool Proportion Band 12, Heat Integral Time 20, Cool Integral Time 43, Heat Throttle Limit 75, Cool Throttle Limit -45.

Example Response: 0 (The settings for Channel 1 Parameter Group 2 have been changed)

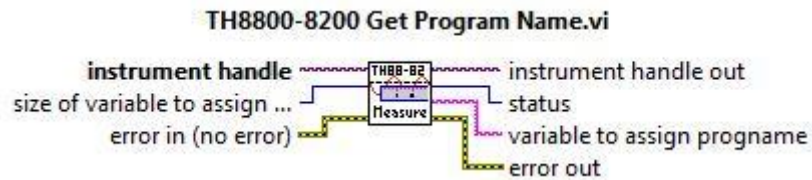
Command Name: TH8800-8200 Get Program Name

Command Type: Program Status

Description:

This command returns the name of the program that is currently loaded. The name is limited to 15 characters.

VI:



Data Type: String

Example Request: NA

Example Response: TEST 26

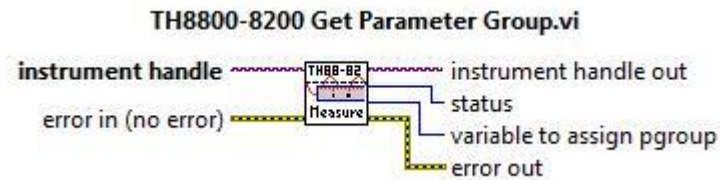
Command Name: TH8800-8200 Get Parameter Group

Command Type: Variable; Edit from Hold

Description:

This command returns the number of the parameter group that the controller is currently using.

VI:



Data Type: Integer

Example Request: NA

Example Response: 2 (This indicates that the current parameter group is 2)

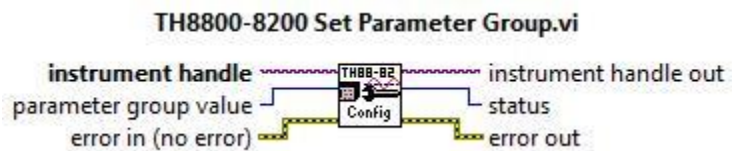
Command Name: TH8800-8200 Set Parameter Group

Command Type: Variable; Edit from Hold

Description:

This command sets the parameter group used by the channels if the controller is in manual mode. If the controller is in Edit from hold it will temporarily change the parameter group used.

VI:



Data Type: Integer

Example Request: 3

Example Response: 0 (This indicates that the current parameter group is 3)

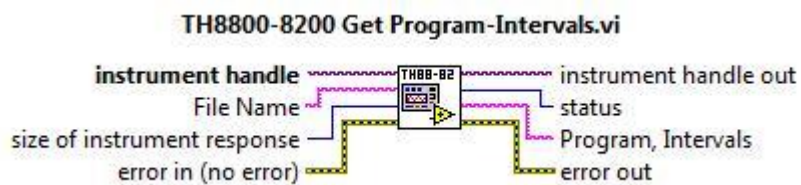
Command Name: TH8800-8200 Get Program/Intervals

Command Type: Programming

Description:

This command returns the name of the program and the number of intervals that it has. Along with Get Initial Interval and Get Interval a entire program can be retrieved from memory.

VI:



Data Type: NA

Example Request: TEST 12

Example Response: TEST 12, 5 (This indicates that TEST 12 has 5 intervals)

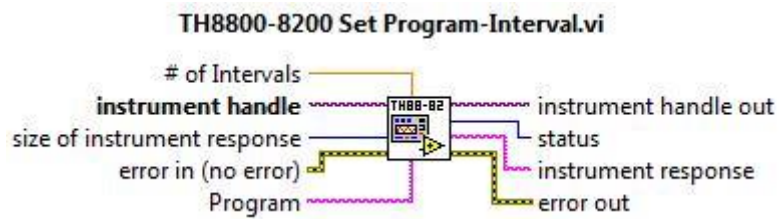
Command Name: TH8800-8200 Set Program/Intervals

Command Type: Programming

Description:

This command sets a name and intervals for a program. Followed by the Set Initial Interval, and Set Interval commands a entire program can be created.

VI:



Data Type: NA

Example Request: TEST 12, 5

Example Response: 0 (This indicates that the program TEST 12 with 5 intervals will be created.)

Command Name: TH8800-8200 Get Process Variable

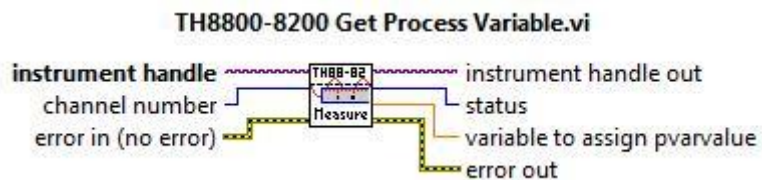
Command Type: Variable

Description:

This command returns the current value for the selected channel.

Channel	Description
1 through 4	External process variable channels 1 through 4
5 through 8	Internal process variable channels 5 through 8
9 through 12	Undefined
13 through 28	Monitor channels 1 through 16
29 through 32	Undefined
33 through 36	System Monitor temperature channels for refrigeration system 1 (high stage suction, high stage discharge, low stage suction, and low stage discharge)
37 through 48	System Monitor channels for refrigeration systems 2, 3, and 4

VI:



Data Type: Decimal

Example Request: Channel 1

Example Response: -78 (This indicates that channel 1 has a value of -78.)

Command Name: TH8800-8200 Get Refrigeration Pressures

Command Type: System Status

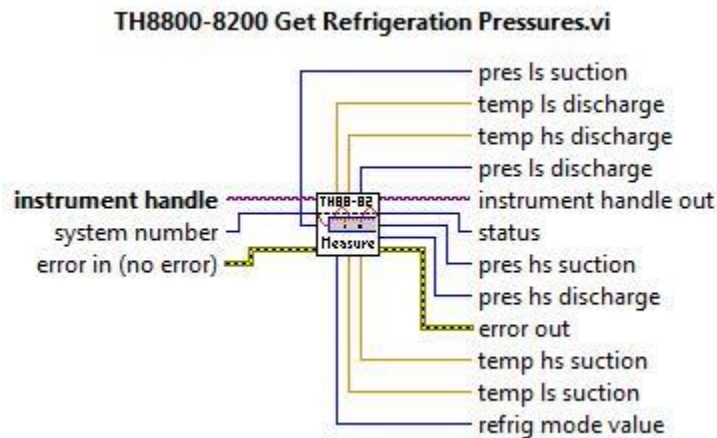
Description:

This command four pressures, four temperatures, and a coded integer, which indicates the mode of the refrigeration.

- Four pressures for high-stage suction, high-stage discharge, low-stage suction, and low-stage discharge.
- Four temperatures for high-stage suction, high-stage discharge, lowstage suction, low-stage discharge.
- One coded integer that indicates the refrigeration mode. Each mode has its own weighting value:

1 Humidity cooling mode	8 Pump-down mode
2 Temperature cooling mode	16 High-stage compressor trip
4 Cascade mode	32 Low-stage compressor trip

VI:



Data Type: String

Example Request: NA

Example Response: 25,220,25,249,-23.2,87.5,-23.6,113.4,6. (This string gives the refrigeration system's pressures and temperatures, and indicates that it is in cascade and temperature cooling modes.)

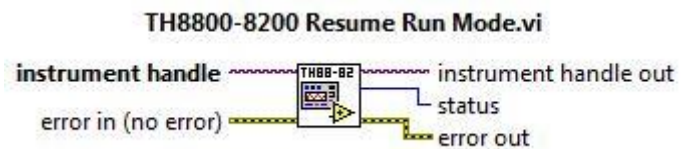
Command Name: TH8800-8200 Resume Run Mode

Command Type: Control

Description:

This command returns a program from hold mode to its run mode.

VI:



Data Type: NA

Example Request: NA

Example Response: 0 (The controller is now in run mode.)

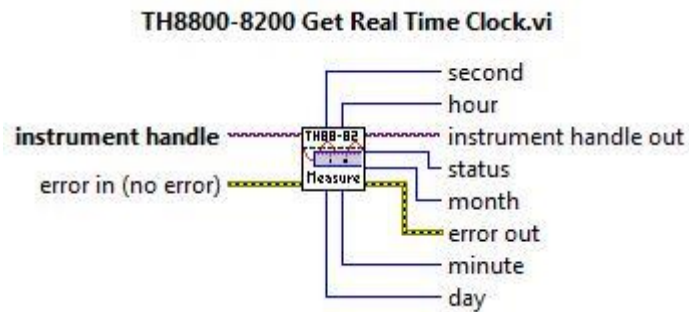
Command Name: TH8800-8200 Get Real Time Clock

Command Type: System Status

Description:

This command returns the date and time from the controller.

VI:



Data Type: String

Example Request: NA

Example Response: 3/11 14:32:45 (This indicates that the date is March 11 and the time is 2:32 p.m.)

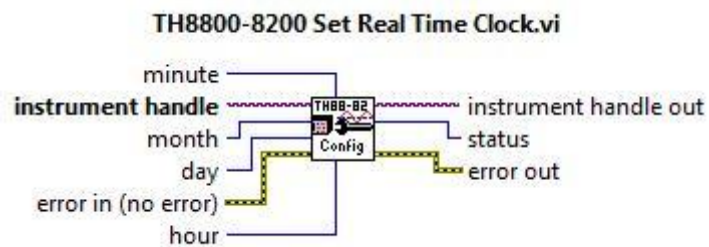
Command Name: TH8800-8200 Set Real Time Clock

Command Type: System Status

Description:

This command sets the date and time for the controller.

VI:



Data Type: String

Example Request: 3/11 16:56:32

Example Response: 0 (The time on the controller now indicates March 11, 4:56 p.m.)

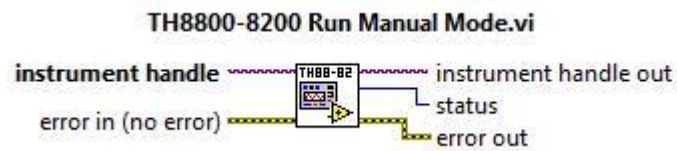
Command Name: TH8800-8200 Run Manual Mode

Command Type: Control

Description:

This command sets a stopped controller into a running manual mode.

VI:



Data Type: NA

Example Request: NA

Example Response: 0 (The controller is running in manual mode.)

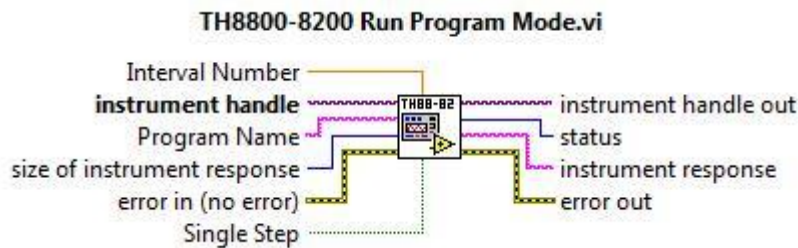
Command Name: TH8800-8200 Run Program Mode

Command Type: Control

Description:

This command sets a stopped controller into a run program mode with a specified program at a specified interval. Also the program can be set in single-step mode, which cause the program to be paced on hold after every interval. Operation can be resumed by using the Resume Mode command.

VI:



Data Type: NA

Example Request: Test 3, 9, Single Step

Example Response: 0 (The controller runs the program Test 3 at interval 9 in single step mode.)

Command Name: TH8800-8200 Get Stop Code

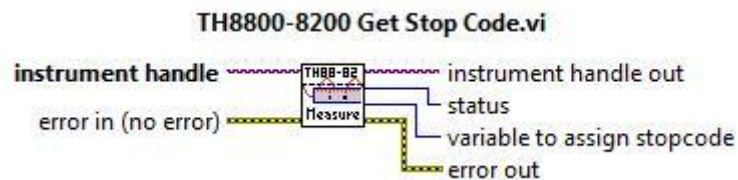
Command Type: System Status

Description:

This command returns a code that indicates the reason for the last transition to the stop mode. The stop codes are defined as follows:

- 0** Cold boot power up. The 8200 memory has been initialized.
- 1** Currently running. Not in stop.
- 2** Stop key pressed.
- 3** End of test.
- 4** External input. An input defined as stop has been activated.
- 5** Computer interface. The 8200 received the stop command.
- 6** Open input. A thermocouple or analog input is open.
- 7** Process alarm. A process alarm setting has been exceeded.
- 8** System Monitor trip.
- 9** Power fail recovery. The selected power fail recover mode was stop.
- 10** Therm-Alarm trip.

VI:



Data Type: Integer

Example Request: NA

Example Response: 3 (Indicates that the currently loaded test has ended.)

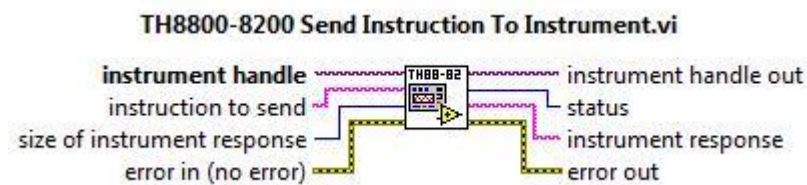
Command Name: TH8800-8200 Send Instruction To Instrument

Command Type: Control

Description:

This command sends a user defined command to the controller and assigns the response to a variable.

VI:



Data Type: String

Example Request: PVAR1?

Example Response: 43 (Indicates that the value of channel 1 is 43.)

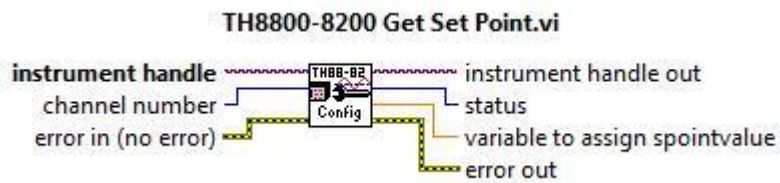
Command Name: TH8800-8200 Get Set Point

Command Type: Variable

Description:

This command returns the set point of the specified channel.

VI:



Data Type: Decimal

Example Request: Channel 1

Example Response: -33 (Indicates that the set point of channel 1 is -33.)

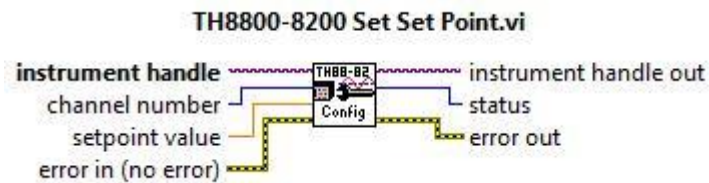
Command Name: TH8800-8200 Set Set Point

Command Type: Variable

Description:

This command sets the set point of the specified channel.

VI:



Data Type: Decimal

Example Request: Channel 1, 45

Example Response: 0 (Indicates that the set point of channel 1 is 45.)

Command Name: TH8800-8200 Get Service Request Byte

Command Type: System Status

Description:

This command returns the same data that a GPIB poll would return. The events, which set the associated bits in the response data, must be enabled in the SRQ mask and are loaded using the SRQM command. The bits are defined as follows:

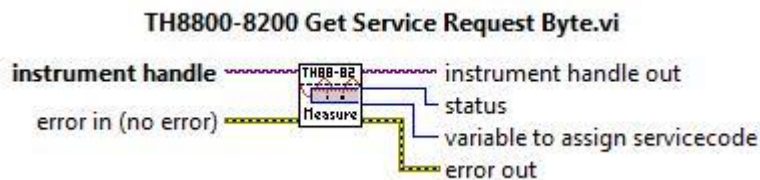
Bit # Definition

0 Change in state
1 Change in alarm status
2 End of interval
3 Match interval

Bit # Definition

4 End of program
5 Error
6 Reserved by GPIB (RSV)
7 Power on reset

VI:



Data Type: Coded Integer

Example Request: NA

Example Response: 65 (Binary value 1000001, which indicates RSV + state change.)

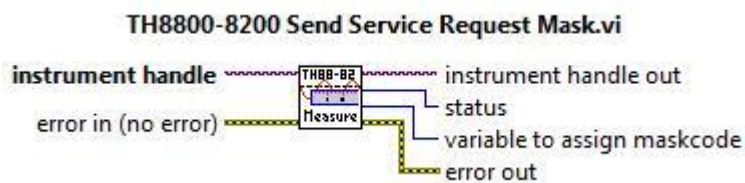
Command Name: TH8800-8200 Send Service Request Mask

Command Type: System Status

Description:

This byte enables the various events for requesting service via the GPIB SRQ line. The coded integer data represents the enabled events using the definitions given under SRQB. **NOTE:** Setting the SRQ mask to zero disables all SRQ interrupts.

VI:



Data Type: Coded Integer

Example Request: NA

Example Response: 4 (The end of interval service request bit has been enabled.)

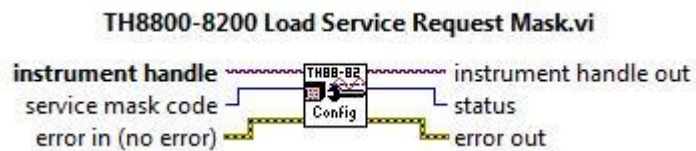
Command Name: TH8800-8200 Load Service Request Mask

Command Type: System Status

Description:

This byte enables the various events for requesting service via the GPIB SRQ line. The coded integer data represents the enabled events using the definitions given under SRQB. **NOTE:** Setting the SRQ mask to zero disables all SRQ interrupts.

VI:



Data Type: Coded Integer

Example Request: 1

Example Response: 0 (The controller loads the SRQ mask with the value 1, enabling the state change SRQ event.)

Command Name: TH8800-8200 Get Status

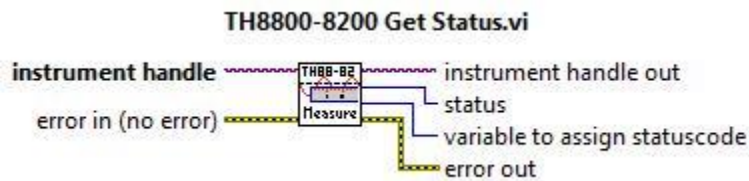
Command Type: System Status

Description:

This command returns one byte of coded decimal data to indicate the status of the controller. The coded decimal representation is as follows:

1 = Run program	16 = Run manual
2 = Hold program	32 = Hold manual
4 = Suspend program	64 = Undefined
8 = Undefined	128 = Undefined

VI:



Data Type: Coded Decimal

Example Request: NA

Example Response: 16 (The controller is in run manual mode.)

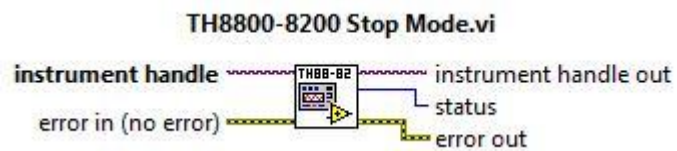
Command Name: TH8800-8200 Stop Mode

Command Type: Control

Description:

This command places the controller in stop mode.

VI:



Data Type: NA

Example Request: NA

Example Response: 0 (The controller is in stop mode.)

Command Name: TH8800-8200 Get Therm-Alarm Settings

Command Type: Setup

Description:

This command returns the values of the Therm-Alarm settings. These settings include:

temp = Therm-Alarm temperature

low = Therm-Alarm low limit

high = Therm-Alarm high limit

maxex = Therm-Alarm maximum excursion

mute = Therm-Alarm mute time

warn = Therm-Alarm warning band

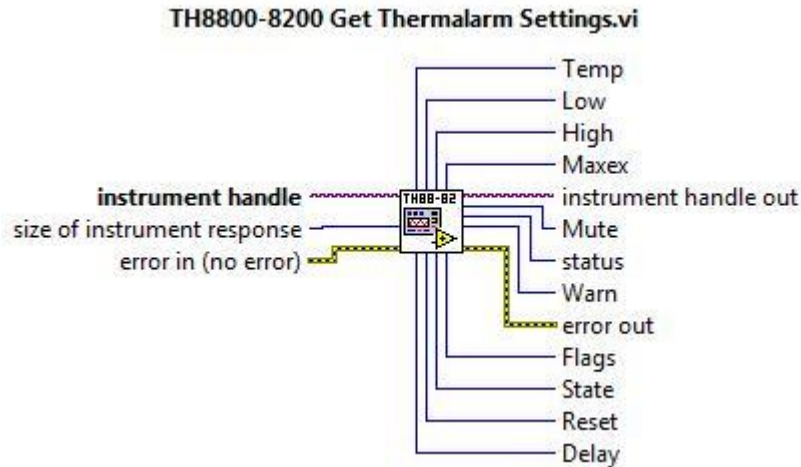
delay = Therm-Alarm alarm delay time

reset = Therm-Alarm reset status: auto (0) or manual (1)

state = Therm-Alarm operating state (internal use only)

flags = Therm-Alarm warning/trip flags (internal use only)

VI:



Data Type: Decimal

Example Request: NA

Example Response: 27, -87, 191, 210, 2, 10, 10, 0, 0, 0

Command Name: TH8800-8200 Set Therm-Alarm Settings

Command Type: Setup

Description:

This command sets the values of the Therm-Alarm settings. These settings include:

low = Therm-Alarm low limit (see chamber documentation for valid ranges)

high = Therm-Alarm high limit (see chamber documentation for valid ranges)

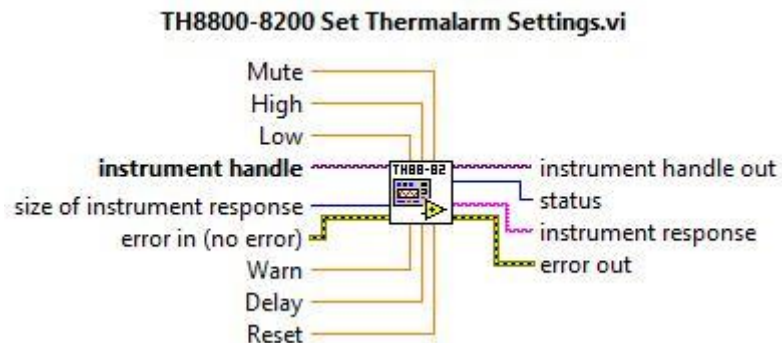
mute = Therm-Alarm mute time (0-99 minutes)

warn = Therm-Alarm warning band (0-15 degrees C)

delay = Therm-Alarm alarm delay time (0-30 seconds)

reset = Therm-Alarm reset status (0 = auto reset, 1 = manual reset)

VI:



Data Type: Decimal

Example Request: -50, 150, 0, 5, 20, 3, 1

Example Response: 0 (The controller loads the Therm-Alarm with the specified settings.)

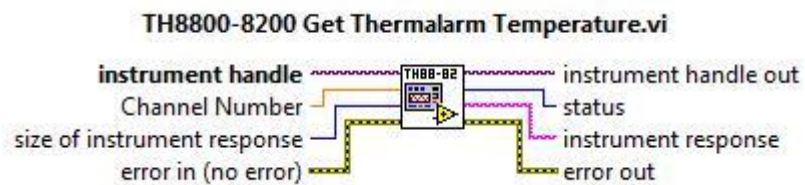
Command Name: TH8800-8200 Get Therm-Alarm Temperature

Command Type: Variable

Description:

This command returns the current Therm-Alarm temperature for a specified channel,

VI:



Data Type: Integer

Example Request: Channel 1

Example Response: 65 (This indicates the Therm-Alarm Temp is 65.)

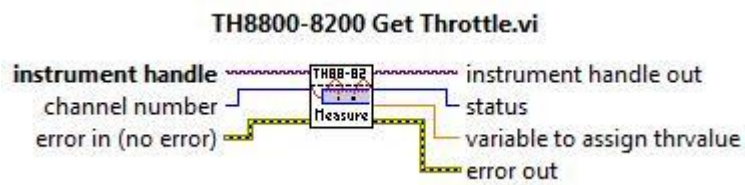
Command Name: TH8800-8200 Get Throttle

Command Type: Variable

Description:

This command returns the throttle reading for a specified channel,

VI:



Data Type: Integer

Example Request: Channel 1

Example Response: -56 (This indicates the throttle is -56.)

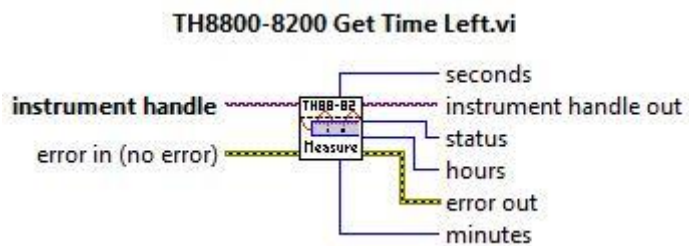
Command Name: TH8800-8200 Get Time Left

Command Type: Program Status; Edit From Hold

Description:

This command returns the time left for the current interval,

VI:



Data Type: String

Example Request: NA

Example Response: 1:17:57 (This indicates there is 1 hour, 17 minutes, and 57 seconds left in the current interval.)

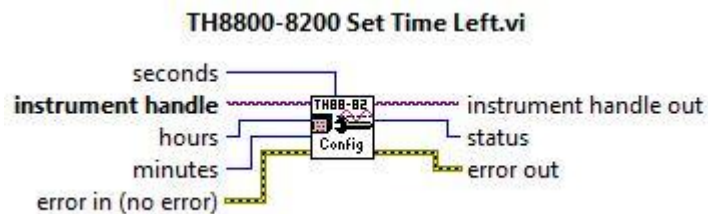
Command Name: TH8800-8200 Set Time Left

Command Type: Program Status; Edit From Hold

Description:

This command sets the time left for the current interval from the edit from hold mode,

VI:



Data Type: String

Example Request: 85 seconds

Example Response: 0 (This command sets the time left in the current interval to 1 minute and 25 seconds.)

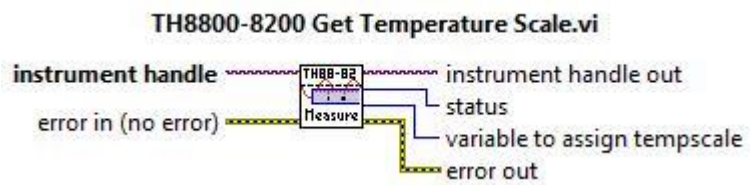
Command Name: TH8800-8200 Get Temperature Scale

Command Type: Variable

Description:

This command returns the temperature scale of the controller,

VI:



Data Type: Coded Integer

Example Request: NA

Example Response: 0 (This indicates that the controller is operating in Celsius.)

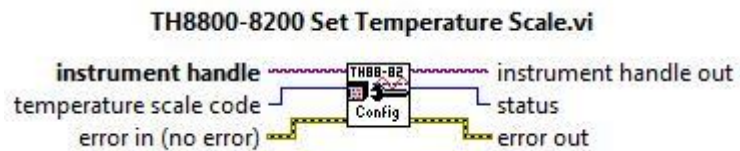
Command Name: TH8800-8200 Set Temperature Scale

Command Type: Variable

Description:

This command sets the temperature scale of the controller, Where 1 is Fahrenheit and 0 is Celsius.

VI:



Data Type: Coded Integer

Example Request: 1

Example Response: 0 (This indicates that the controller is operating in Fahrenheit.)

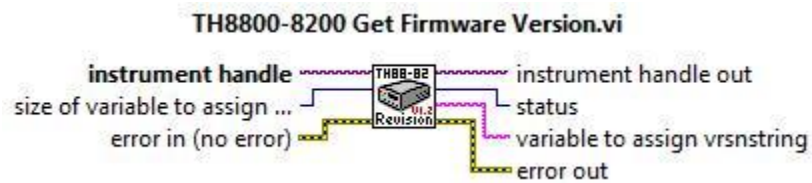
Command Name: TH8800-8200 Get Firmware Version

Command Type: System Status

Description:

This command returns the version number of the display software.

VI:



Data Type: String

Example Request: NA

Example Response: V1.18 04/02/2008
