



1120 T/C Simulator/Calibrator  
LabView Instrument Driver

BY

J. AGRAZ

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ECTRON CORPORATION  
8159 ENGINEER RD,  
SAN DIEGO CALIFORNIA, 92111



## *Thermocouple Simulator Calibrator 1120*

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### LabView Instrument Driver

#### Introduction

This virtual Instrument or VI, was developed to simulate all functions of the Ectron's Thermocouple simulator calibrator 1120. The main objective of this VI is to minimize the customer's ATE systems development time, where the Ectron's T/C simulator is needed.

#### Description:

The VI is composed of a front panel and a block diagram. The front panel was designed to simulate the actual instrument's front panel as closely as possible. The block diagram contains the actual computer code that controls its execution.

#### Front panel:

The front panel is composed of seven controls and seven different indicators. Also a GPIB address control and two Error in/out clusters (Fig. 1.1).

There are two possible ways to enter data to the VI, one way is to have the main program diagram feed data to the driver's icon, or by opening the front panel and entering the data using the keyboard and mouse.

Input to the VI is done by typing the desire number onto the front panel display. All other controls are selected by pointing the mouse to the control and press and hold the right mouse button, then making a selection.

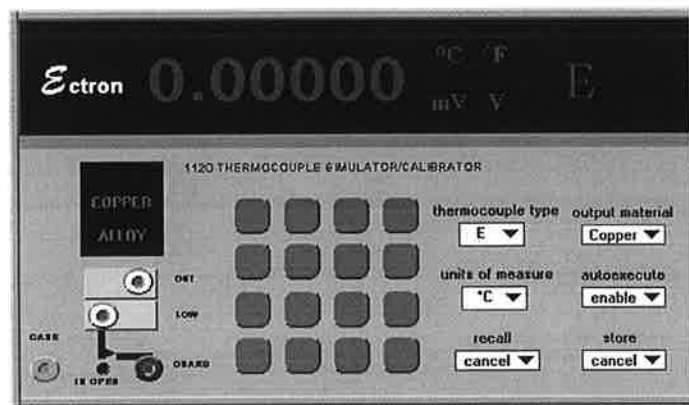


Fig. 1.1 Ectron's 1120 Virtual Instrument

## Controls

- Numeric Input
- Thermocouple type
- Units of measure
- Output material
- Autoexecute
- Memory store
- Memory recall
- GPIB address

## Indicators

- Thermocouple Display
- Degrees C
- Degrees F
- milliVolts
- Volts
- Copper
- Alloy
- Error in
- Error out

## Block Diagram:

The block diagram (code) is composed of nine different VIs (Fig. 1.2) :

- Initialize
- Units of measure
- Thermocouple Type
- Output Material
- Memory
- Autoexecute
- Decoder
- Number to string converter
- Close

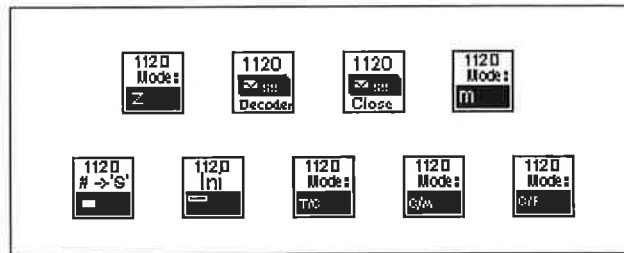


Fig. 1.2 Virtual Instrument main subVI's

## Accessing Ectron's 1120 LabView driver

The driver contains ten controls (Fig. 1.3 and Table 1.1) that allows full control over the instrument. These controls are:

Control	Type	Description	Example
Numeric Input	double	Input numeric	0, 1, 2, 3, 4, 5...
Thermocouple Type	1 Byte, signed	Input T/C selection	E, J, K, T, R, S, B, & *
Units of Measure	1 Byte, signed	Input measure selection	Degrees C, F, mV & V
Output Material	1 Byte, signed	Input output type selection	Copper & Alloy
Autoexecute	1 Byte, signed	Input execute selection	Able & Disable
Recall	1 Byte, signed	Input recall selection	Cancel, 1 through 8
Store	1 Byte, signed	Input store selection	Cancel, 1 through 8 & Reset
Error In	Cluster	Standard Input Error Cluster	Error code, Boolean and source
Error Out	Cluster	Standard Output Error Cluster	Error code, Boolean and source
GPIB Address	String	Input address selection	INSTR{ GPIB::8 }

Table. 1.1 Virtual Instrument Controls

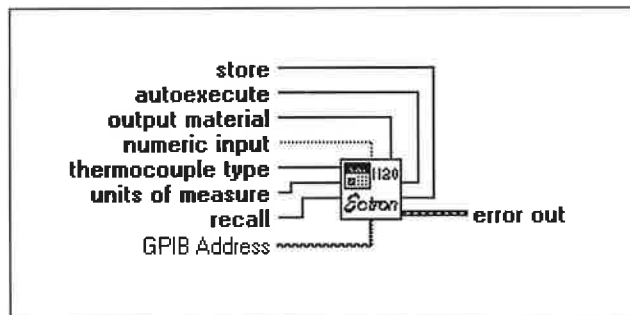


Fig. 1.3 Virtual Instrument controls

### **Numeric Input**

This control is of the type double and requires a set of numeric as input. The control will ignore anything else other than numbers. The default value is zero.

### **Thermocouple Type**

This control is of the type of a signed byte and requires numbers from 0 to 7 as input. The control selects the thermocouple type to be used (Table 1.2). The default value is zero or T/C type E.

<b>Input Number</b>	<b>Thermocouple selected</b>
0	E (default)
1	J
2	K
3	T
4	R
5	S
6	B
7	*

**Table. 1.2** Thermocouple Selection

### Units of Measure

This control is of the type signed byte and requires numbers from 0 to 3 as input. The control selects the output function to be used. Degrees C, F, milliVolts and Volts (Table 1.3). The default value is zero or Degrees Celsius.

Function Number	Function Output
0	C (default)
1	F
2	mV
3	V

Table. 1.3 Measure Mode Selection

### Output Material

This control is of the type signed byte and requires numbers from 0 to 1 as input. The control selects the output function to be used. Copper & Alloy modes (Table 1.4). The default value is zero or Copper.

Output Mode number	Output Mode
0	Copper (default)
1	Alloy

Table. 1.4 Output Material Selection

### Autoexecute

This control is of the type signed byte and requires numbers from 0 to 1 as input. The control selects whether an execute command is issued (Table 1.5). The default value is one or auto execution.

Execute Mode number	Execute Mode
0	disable
1	able (default)

Table. 1.5 Autoexecute Selection

## Recall

This control is of the type signed byte and requires numbers from 0 to 8 as input. The control selects the memory location to recall data from. 0 through 8 (Table 1.6). The default value is zero or Cancel, no selection.

Recall Number	Function selected
0	Cancel (default)
1	Recall Loc 1
2	Recall Loc 2
3	Recall Loc 3
4	Recall Loc 4
5	Recall Loc 5
6	Recall Loc 6
7	Recall Loc 7
8	Recall Loc 8

Table. 1.6 Memory Recall Selection



## Store

This control is of the type signed byte and requires numbers from 0 to 9 as input. The control selects the memory location to store data to. 0 through 9 (Table 1.7). The default value is zero or Cancel, no selection.

Store Number	Function selected
0	Cancel (default)
1	Store Loc 1
2	Store Loc 2
3	Store Loc 3
4	Store Loc 4
5	Store Loc 5
6	Store Loc 6
7	Store Loc 7
8	Store Loc 8
9	RESET

Table. 1.7 Memory Store Selection

## GPIB Address

This control is of the type string and requires printable characters. The control specifies the GPIB address the unit under test (UUT) is programmed to.

## Error in/out clusters

This control is of the type cluster and contains three separate controls/indicators (depending on the cluster In or Out). These two clusters are standard to VIs and contain a Boolean, code number and a string source.