

# Using Isotech milliK and I-Cal Easy

- Configure milliK
- In this example we have
  - Reference PRT on Channel 1
  - Thermocouple on Channel 2
  - Current Transmitter on Channel 3



TritonFF

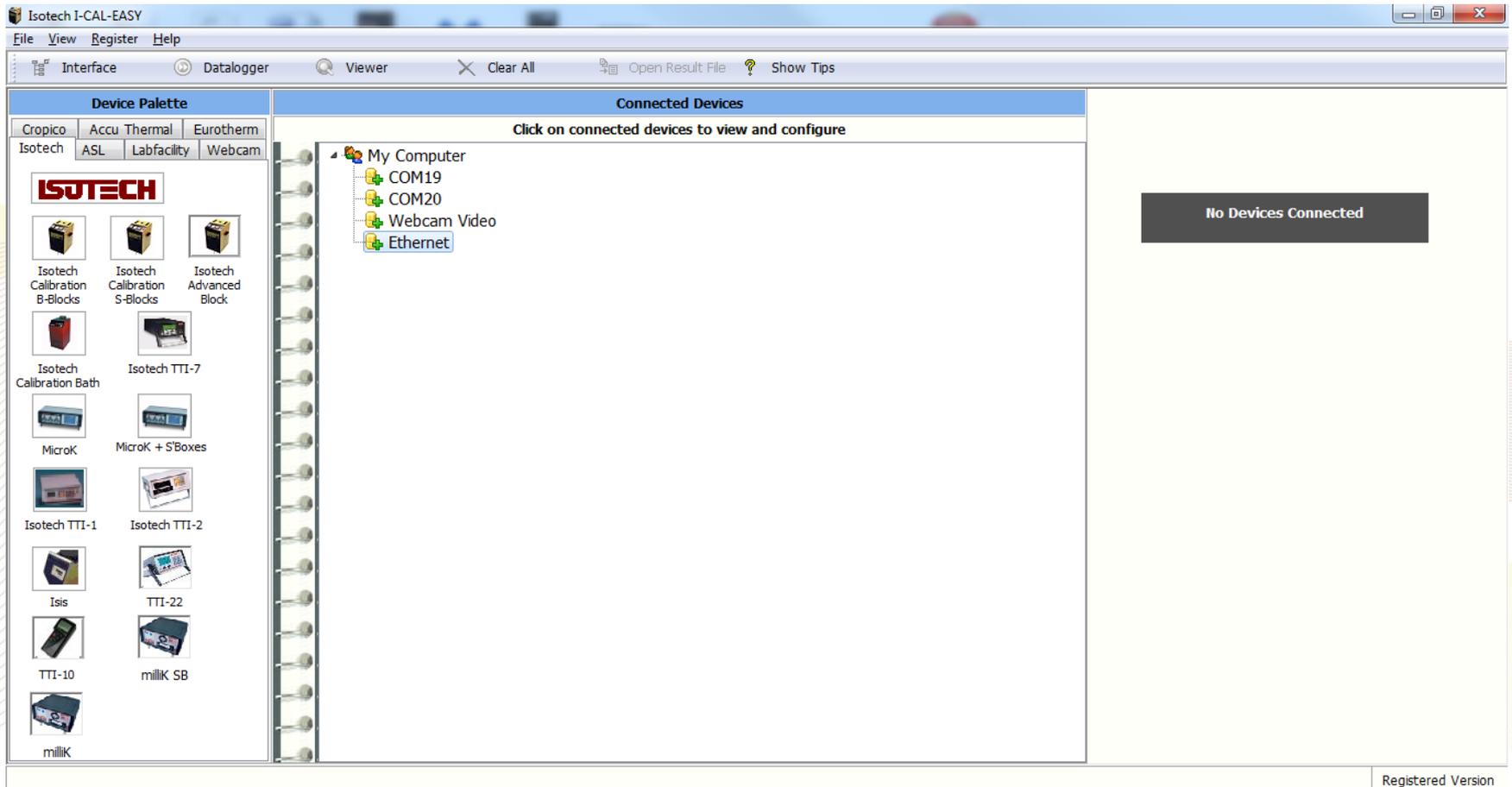
File Zoom Display Tools Help

Channel 1 All Channels Clear Statistics Start Save

Ch	Value	Units	Mean	Std Dev
1	24.752 9	°C	24.739 03	0.008 55
2	24.77	°C	24.752	0.010
3	7.998	mA	7.995 6	0.001 4
2-1	0.02	°C	0.013	0.008

Graph Numeric Settings Instrument

# Start the Laboratory Interface



# Drag the milliK to the COM Port

The screenshot shows the Isotech I-CAL-EASY software interface. The 'Device Palette' on the left contains various calibration devices, including the 'milliK' at the bottom. The 'Connected Devices' pane in the center shows a tree view under 'My Computer' with 'COM19' selected. The 'Isotech milliK Precision Thermometer MS' window on the right displays a data table with three channels. At the bottom of this window, the 'COM19' port is highlighted, and the 'Start' button is active, indicating the connection is established.

Channel	Temperature	Unit	Time	Date	Direction
CHAN 1	24.7875	C	11:30:37	11/4/2015	←
CHAN 2	24.8035	C	11:30:35	11/4/2015	←
CHAN 3					

Drag and Drop devices from Device Pallet to connect

Registered Version

# Press START and Select CHAN 3

- The measurements from the milliK channels can now be seen

CHAN 1	24.7921	C	11:31:50	11/4/2015		←
CHAN 2	24.8122	C	11:31:53	11/4/2015	←	←
CHAN 3	8.00395	mA	11:31:48	11/4/2015		←

COM19 Interface Start Remove

COM19 Port OPEN

# Now Drag the Dry Block Across

The screenshot shows the Isotech I-CAL-EASY software interface. The window title is "Isotech I-CAL-EASY". The menu bar includes "File", "View", "Register", and "Help". The toolbar contains "Interface", "Datalogger", "Viewer", "Clear All", "Open Result File", and "Show Tips".

The interface is divided into three main sections:

- Device Palette:** A vertical list of device icons on the left. The "ISOTECH" logo is at the top. Below it are icons for "Isotech Calibration B-Blocks", "Isotech Calibration S-Blocks", "Isotech Advanced Block", "Isotech Calibration Bath", "Isotech TTI-7", "MicroK", "MicroK + S'Boxes", "Isotech TTI-1", "Isotech TTI-2", "Isis", "TTI-22", "TTI-10", "milliK SB", and "milliK".
- Connected Devices:** A tree view in the center showing a hierarchy: "My Computer" (expanded) contains "COM19", "Isotech milliK-MS", "COM20", "Webcam Video", "Ethernet" (expanded), and "Isotech Advanced".
- Isotech Calibration Block:** A table on the right with columns "Value", "Units", "Time", and "Date". It has rows for "Setpoint" and "Proc Var". The "Setpoint" row has a "Set" button in the "Value" column.

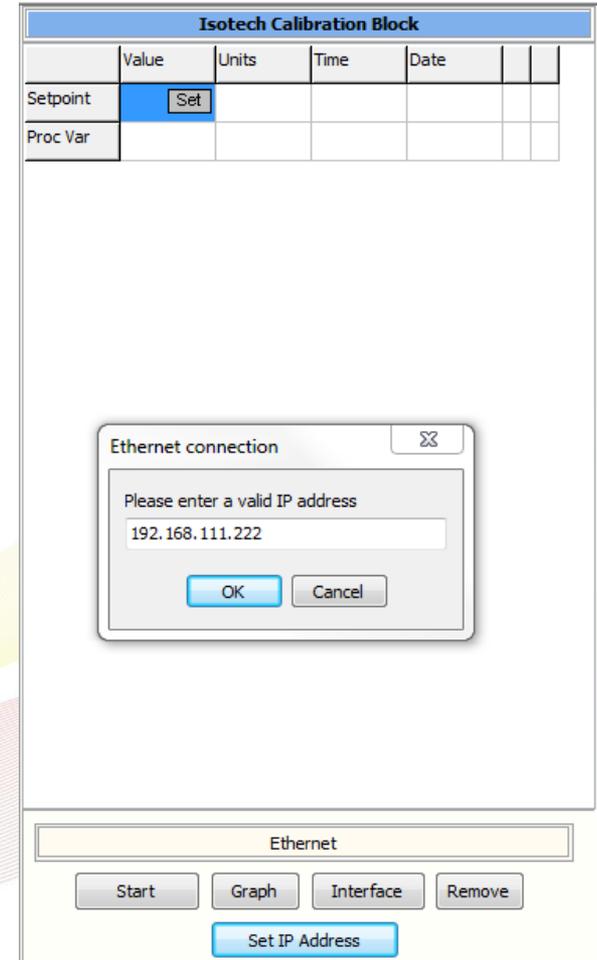
At the bottom of the interface, there is a section for "Ethernet" with buttons for "Start", "Graph", "Interface", "Remove", and "Set IP Address".

Drag and Drop devices from Device Palette to connect

Registered Version

# Dry Block Configuration

- Here we are using the ADVANCED model which connects to Ethernet and the IP Address is set
- The Basic and Site models are dragged to the COM Ports



# Dry Block Configuration

- Press Start and we see the Dry Block Data

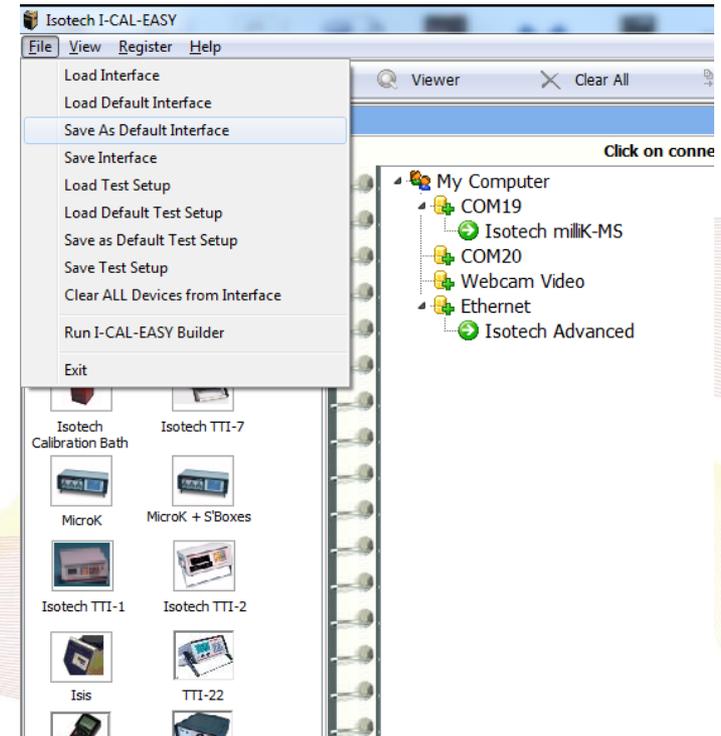
The screenshot displays the 'Isotech Calibration Block' interface. It features a table with the following data:

	Value	Units	Time	Date		
Setpoint	25.00	Set	11:39:17 AM	11/4/2015	✓	
Proc Var	25.01		11:39:17 AM	11/4/2015	✓	
Chan 1	24.09		11:39:18 AM	11/4/2015		
Chan 2	26.37		11:39:16 AM	11/4/2015	✓	
Chan 3	24.51		11:39:17 AM	11/4/2015	✓	

Below the table, the status is shown as 'Status: Connected with'. At the bottom, there are several control buttons: 'Start', 'Graph', 'Interface', 'Remove', and 'Set IP Address'.

# Saving Interface

- You can save the interface configuration or make it to the default
- Saving the need to drag the equipment each time



# Dry Block Configuration

- Press Start and we see the Dry Block Data

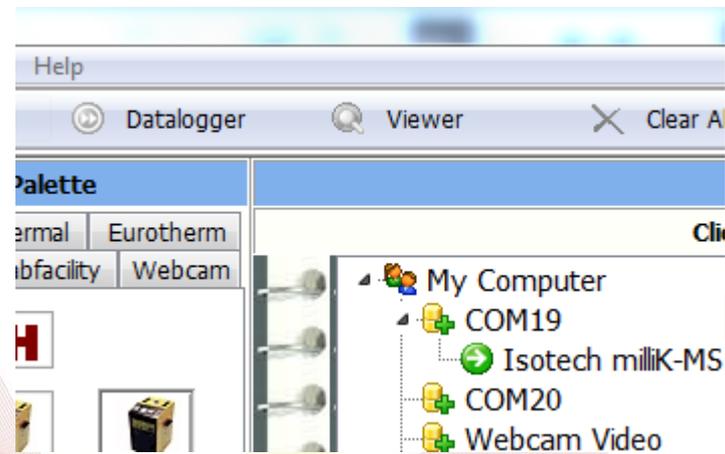
The screenshot displays the 'Isotech Calibration Block' interface. At the top, there is a blue header with the text 'Isotech Calibration Block'. Below this is a table with the following data:

	Value	Units	Time	Date		
Setpoint	25.00	Set	11:39:17 AM	11/4/2015	✓	
Proc Var	25.01		11:39:17 AM	11/4/2015	✓	
Chan 1	24.09		11:39:18 AM	11/4/2015		
Chan 2	26.37		11:39:16 AM	11/4/2015	✓	
Chan 3	24.51		11:39:17 AM	11/4/2015	✓	

Below the table, there is a status bar that reads 'Status: Connected with'. At the bottom of the interface, there are several buttons: 'Start' (highlighted in blue), 'Graph', 'Interface', 'Remove', and 'Set IP Address'.

# Configuring the Test

- Click Datalogger



# Configuring the Test

## Click Datalogger

Isotech I-CAL-EASY

File View Register Help

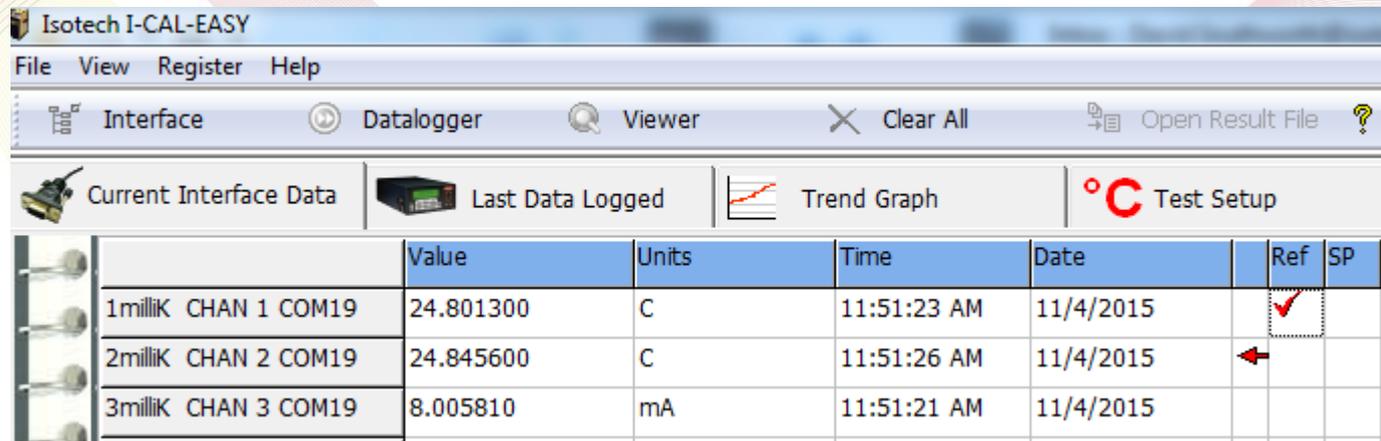
Interface Datalogger Viewer Clear All Open Result File Show Tips

Current Interface Data Last Data Logged Trend Graph °C Test Setup Units Under Test

	Value	Units	Time	Date	Ref	SP	Decimals	
1milliK CHAN 1 COM19	24.800500	C	11:49:38 AM	11/4/2015			0.000000	Set
2milliK CHAN 2 COM19	24.798000	C	11:49:40 AM	11/4/2015	←		0.000000	Set
3milliK CHAN 3 COM19	8.005810	mA	11:49:35 AM	11/4/2015			0.000000	Set
4 ABlock Setpoint	25.000000		11:49:39 AM	11/4/2015			0.000000	Set
5 ABlock Proc Var	25.000000		11:49:39 AM	11/4/2015			0.000000	Set
6 ABlock Chan 1	24.220000		11:49:40 AM	11/4/2015	←		0.000000	Set
7 ABlock Chan 2	26.440000		11:49:40 AM	11/4/2015			0.000000	Set
8 ABlock Chan 3	24.500000		11:49:41 AM	11/4/2015			0.000000	Set

# Configuring the Test

- In the Ref Column Click to Tick which Channel is used as the **reference** – here milliK CHAN 1



The screenshot shows the Isotech I-CAL-EASY software interface. The main window displays a table of data with columns for Value, Units, Time, Date, Ref, and SP. The 'Ref' column has a red checkmark in the first row, indicating that the 1milliK channel is selected as the reference. A red arrow points to the 'Ref' column header.

	Value	Units	Time	Date	Ref	SP
1milliK CHAN 1 COM19	24.801300	C	11:51:23 AM	11/4/2015	<input checked="" type="checkbox"/>	
2milliK CHAN 2 COM19	24.845600	C	11:51:26 AM	11/4/2015	<input type="checkbox"/>	
3milliK CHAN 3 COM19	8.005810	mA	11:51:21 AM	11/4/2015	<input type="checkbox"/>	

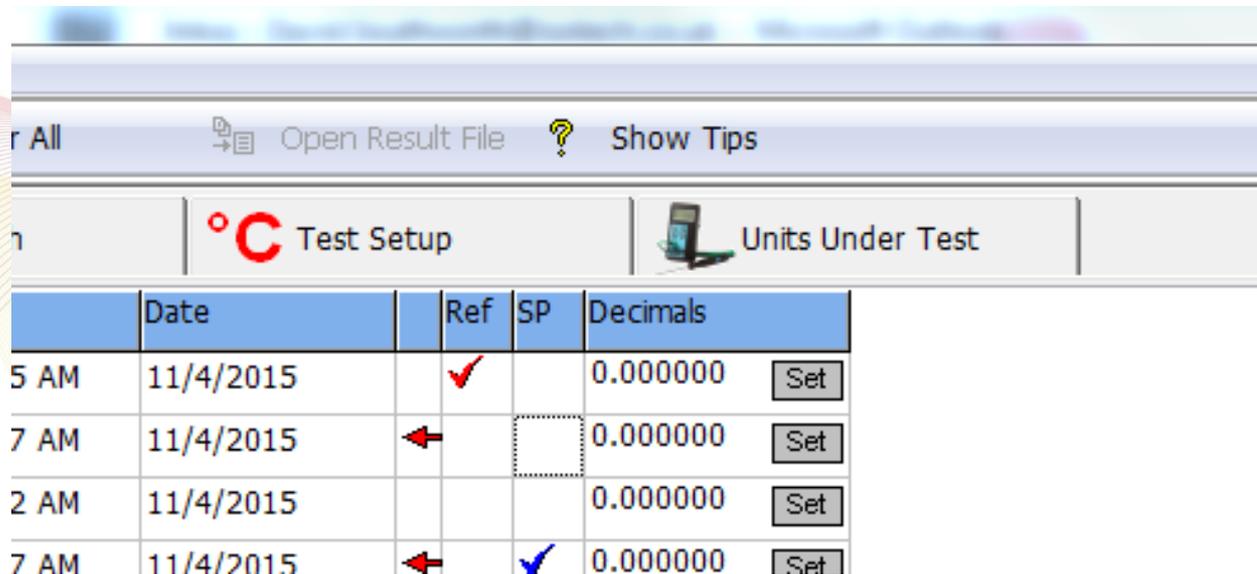
# Configuring the Test

- In the SP Column Click to Tick which channel is set the **setpoint**
- Here 4 ABlock Setpoint

	Value	Units	Time	Date	Ref	SP	Decimals	
1milliK CHAN 1 COM19	24.802600	C	11:53:01 AM	11/4/2015		✓	0.000000	Set
2milliK CHAN 2 COM19	24.832400	C	11:53:04 AM	11/4/2015			0.000000	Set
3milliK CHAN 3 COM19	8.005810	mA	11:53:06 AM	11/4/2015	←		0.000000	Set
4 ABlock Setpoint	25.000000		11:53:07 AM	11/4/2015		✓	0.000000	Set
5 ABlock Proc Var	25.000000		11:53:07 AM	11/4/2015			0.000000	Set
6 ABlock Chan 1	24.250000		11:53:05 AM	11/4/2015			0.000000	Set
7 ABlock Chan 2	26.470000		11:53:06 AM	11/4/2015			0.000000	Set
8 ABlock Chan 3	24.510000		11:53:07 AM	11/4/2015			0.000000	Set

# Configuring the Test

- Click °C Test Setup



The screenshot shows a software interface with a table. The table has columns for Date, Ref, SP, and Decimals. The first row has a red checkmark in the Ref column and a 'Set' button. The second row has a red arrow in the Ref column and a 'Set' button. The third row has a red arrow in the Ref column and a 'Set' button. The fourth row has a red arrow in the Ref column and a blue checkmark in the SP column, with a 'Set' button.

	Date	Ref	SP	Decimals	
5 AM	11/4/2015	✓		0.000000	Set
7 AM	11/4/2015	←		0.000000	Set
2 AM	11/4/2015			0.000000	Set
7 AM	11/4/2015	←	✓	0.000000	Set

# Configuring the Test

Click °C  
Test Setup

Current Interface Data | Last Data Logged | Trend Graph | °C Test Setup

Test Parameters | Reference Standard | Default Decimal Places

Number of Test Points  
  
 Set Temperature Manually 3

Stability of Reference Temperature  
 Spread Tolerance ± 0.5      Offset Limit ± 0.5  
 Use last 10 readings for stability check

Readings Per Setpoint AFTER Stability  
 Record 3 readings after stability

Setpoint Parking Temperature °C  
  
 Park when test is finished

Logging Interval

	Setpoint
Temperature 1	
Temperature 2	
Temperature 3	

Test Controls

Setpoint = 25.00      Reference = 24.8      Point      Uncorrecte

# Configuring the Test

- In this quick test four temperatures have been entered
- We check for stability over 10 minutes
- And take 3 measurements at each point when stable

The screenshot displays the 'Test Setup' interface with the following configuration details:

- Test Parameters:**
  - Number of Test Points: 4 (Set Temperature Manually)
  - Stability of Reference Temperature:
    - Spread Tolerance: ± 0.1
    - Offset Limit: ± 4
    - Use last: 10 readings for stability check
  - Readings Per Setpoint AFTER Stability: Record 3 readings after stability
  - Setpoint Parking Temperature °C: 25.0
  - Park when test is finished
  - Logging Interval: 1 minute
- Reference Standard:**

	Setpoint
Temperature 1	25
Temperature 2	50
Temperature 3	75
Temperature 4	100
- Test Controls:** Includes buttons for Start, Stop, Pause, and other test functions.
- Status Bar:**
  - Setpoint = 25.00
  - Reference = 24.8
  - Point
  - Uncorrected

# Configuring the Test

- Under the Units Under Test option we can optionally enter operator data and identifications.
- This data can then be exported to a certificate

	Serial Number	Device Type	Model	Job Reference	Comments
1millK CHAN 1 COM19			Set		
2millK CHAN 2 COM19			Set		
3millK CHAN 3 COM19			Set		
4 ABlock Setpoint			Set		
5 ABlock Proc Var			Set		
6 ABlock Chan 1			Set		
7 ABlock Chan 2			Set		
8 ABlock Chan 3			Set		

Test Comments 1:

Test Comments 2:

Test Comments 3:

Test Comments 4:

Test Comments 5:

Test Comments 6:

Test Memo

# Configuring the Test

Current Interface Data

Last Data Logged

Trend Graph

Test Setup

Units Under Test

Units Under Test

	Serial Number	Device Type	Model	Job Reference	Comments
1milliK CHAN 1 COM19		Pt100	<input type="button" value="Set"/>		
2milliK CHAN 2 COM19		Type N	<input type="button" value="Set"/>	EG XYZ	MIMS TYpe N 300mm long
3milliK CHAN 3 COM19			<input type="button" value="Set"/>	EG XYZ	4 - 20mA Current Transmitter / RTD
4 ABlock Setpoint			<input type="button" value="Set"/>		
5 ABlock Proc Var			<input type="button" value="Set"/>		
6 ABlock Chan 1			<input type="button" value="Set"/>		
7 ABlock Chan 2			<input type="button" value="Set"/>		
8 ABlock Chan 3			<input type="button" value="Set"/>		

Test Comments 1:

Test Comments 2:

Test Comments 3:

Test Comments 4:

Test Comments 5:

Test Comments 6:

Test Memo

Simple Demonstration with a milliK - Reference RTD n Cahnnel 1, Type N TC Channel 2 and 4-20mA on Cahnnel 3

# (Standard Information goes in Reference Standard under °C Test Setup)

Current Interface Data
 Last Data Logged
 Trend Graph
 °C Test Setup
 Units Under Test

Test Parameters
Reference Standard
Default Decimal Places

Reference Temperature Conversion

None Serial Number

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Thermocouple **Note: Calibration Coefficients - must be calculated using MICROVOLTS**

Coeff A

Coeff B

Coeff C

$$y = at + bt^2 + ct^3$$

Where: y = voltage correction  
t = temperature(°C)

Type

Output Units

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ITS-90

Above Water TP

Coeff A

Coeff B

Coeff C

Coeff D

Below Water TP

Coeff A

Coeff B

WAI

Rwtp

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Correct Standard Value - using regression polynomial curve-fit

Coeff A

Coeff B

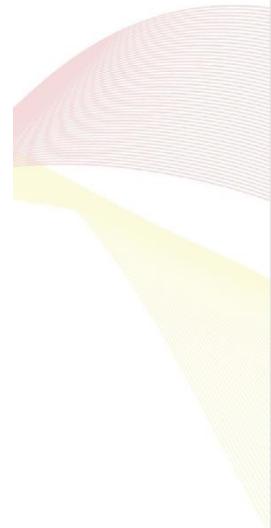
Coeff C

Coeff D

**Regression curve-fit as follows:**

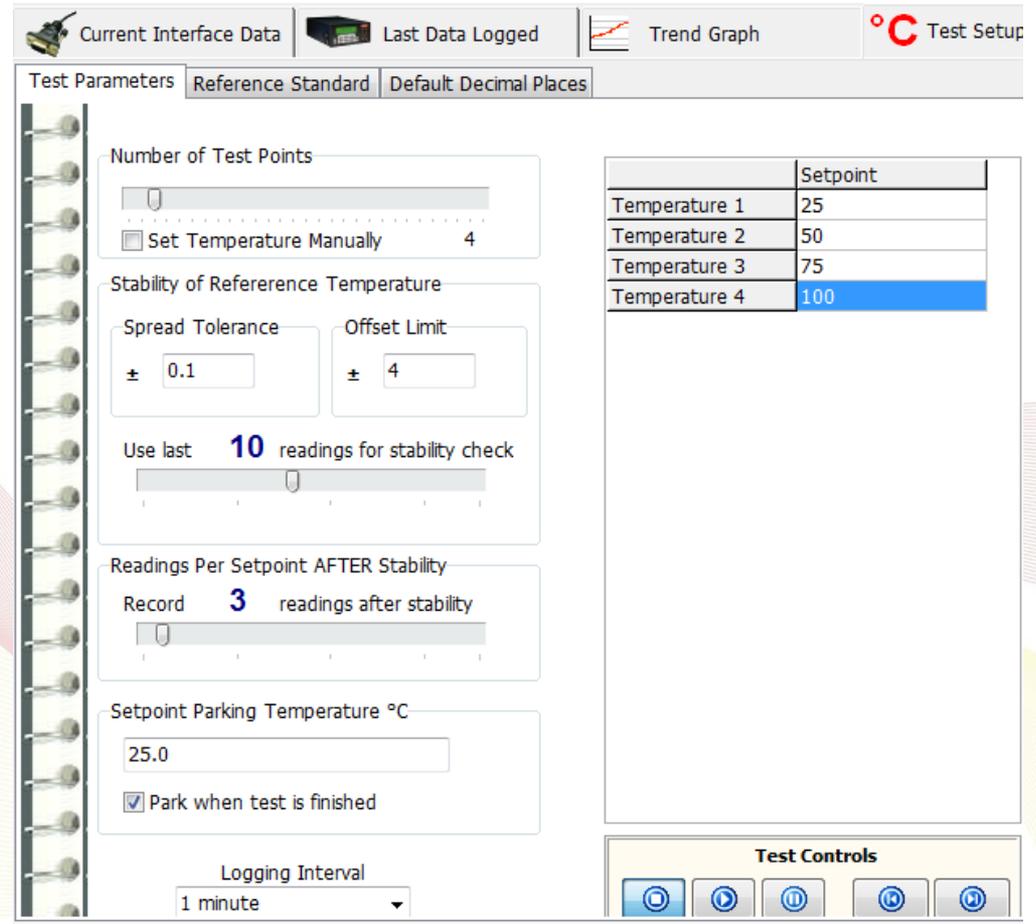
$$y = Ax^3 + Bx^2 + Cx + D$$

**Where: x = unit under test value**  
**y = corrected value**



# Start the Test

- Click 
- Choose where to save the data from the resulting dialogue



Current Interface Data | Last Data Logged | Trend Graph | °C Test Setup

Test Parameters | Reference Standard | Default Decimal Places

Number of Test Points  
 4  
 Set Temperature Manually

Stability of Reference Temperature  
 Spread Tolerance: ± 0.1 | Offset Limit: ± 4  
 Use last 10 readings for stability check

Readings Per Setpoint AFTER Stability  
 Record 3 readings after stability

Setpoint Parking Temperature °C  
 25.0  
 Park when test is finished

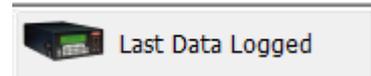
Logging Interval  
 1 minute

	Setpoint
Temperature 1	25
Temperature 2	50
Temperature 3	75
Temperature 4	100

Test Controls

# Monitoring the Test

## Click Last Data Logged



- “Run Data” shows the status for all channels
- Here milliK CHAN 3 in mA vs the RTD Reference

Current Interface Data		Last Data Logged		Trend Graph		°C Test Setup		Units Under Test		
Last Scan	Run Data	Data Files								
		3milliK CHAN 3 COM1	Chan Mean	Reference	Ref Mean	Setpoint	Spread Tol	Offset Tol	Status	
		Reading 1	15.947700	15.944950	74.533900	74.515100	75.000000	TRUE	TRUE	pre-stability
		Reading 2	15.947700	15.943460	74.532500	74.506250	75.000000	TRUE	TRUE	pre-stability
		Reading 3	15.947700	15.941360	74.531100	74.494060	75.000000	TRUE	TRUE	pre-stability
		Reading 4	15.947200	15.938470	74.528900	74.477340	75.000000	TRUE	TRUE	pre-stability
		Reading 5	15.946800	15.934510	74.525600	74.454540	75.000000	TRUE	TRUE	pre-stability
		Reading 6	15.946300	15.929100	74.521700	74.423640	75.000000	TRUE	TRUE	pre-stability
		Reading 7	15.944900	15.922060	74.514300	74.381730	75.000000	FALSE	TRUE	unstable
		Reading 8	15.943000	15.912590	74.503100	74.325460	75.000000	FALSE	TRUE	unstable
		Reading 9	15.940700	15.899860	74.489400	74.249960	75.000000	FALSE	TRUE	unstable
		Reading 10	15.937500	15.882740	74.470500	74.148230	75.000000	FALSE	TRUE	unstable
		Reading 11	15.932800	15.859690	74.445400	74.010750	75.000000	FALSE	TRUE	unstable
		Reading 12	15.926700	15.828900	74.410600	73.826610	75.000000	FALSE	TRUE	unstable
		Reading 13	15.918800	15.787520	74.363900	73.580230	75.000000	FALSE	TRUE	unstable
		Reading 14	15.907600	15.732560	74.300900	73.249780	75.000000	FALSE	TRUE	unstable
		Reading 15	15.892700	15.659830	74.216600	72.826860	75.000000	FALSE	TRUE	unstable
		Reading 16	15.875900	15.564610	74.102600	72.269280	75.000000	FALSE	TRUE	unstable
		Reading 17	15.850200	15.440560	73.951600	71.541850	75.000000	FALSE	TRUE	unstable
		Reading 18	15.815700	15.282460	73.748100	70.605770	75.000000	FALSE	FALSE	unstable
		Reading 19	15.769500	15.085450	73.472100	69.426190	75.000000	FALSE	FALSE	unstable
		Reading 20	15.707000	14.846640	73.095700	67.979280	75.000000	FALSE	FALSE	unstable
		1milliK CHAN 1 COM19	2milliK CHAN 2 COM19	3milliK CHAN 3 COM19	4 ABlock Setpoint	5 ABlock Proc Var	6 ABlock Chan 1	7 ABlock Chan 2	8 ABlock Chan 3	
Next Scan Due: 1:49:19 PM		Spread Error: 0.0188		Spread Tol: 0.1						
Last Scan: 1:48:20 PM		Offset Error: 0.4849		Offset Tol: 4						
Time Now: 1:48:38 PM										

# End of the Test

- At the end of test the **Certificate Builder** is used to review the data and print certificates

