READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 10:21
User: R. J. Starke

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain R&D (T ch) - KSV.sv8

Process Summary

Process Name: Bread Oven + Plain Bread
Product Name: Plain Bread
Process Notes: 63 Trays, 108 Burners, 8 Zones.
Trays are 32" deep.
Headroom is 5.5" plus.
Equipment Type: DGF Lap Oven
Manufacturer: Baker Perkins
Model #/Serial #: 970

Company Name: Reading Thermal
Process Address: Bread Plant
Location Altitude (ft) 675.0 **Atm. Pres (KPa):** 98.7259
Conveyor Type: Tray Conveyor
Conveyor Width: 148" or 12'4" Trays
Heat Tolerance Coefficients AIB 160727 - Whole Wheat Bread - Salmonel

Zone	Length (ft)	Name	Temp Setpoint (°F)	Exhaust % Open	Notes
1	16.0	Zone 1 Top	400.0	0	
2	17.3	Zone 2 Top	400.0	0	
3	17.5	Zone 3 Top	400.0	0	
4	17.7	Zone 4 Top	400.0	0	
5	25.3	Zone 5 Top	400.0	0	
6	29.5	Zone 6 Bot	400.0	0	
7	29.8	Zone 7 Bot	395.0	0	
8	34.0	Zone 8 Bot	395.0	0	
9	187.1 total				

READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 10:21
User: R. J. Starke

Profile Summary

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain R&D (T ch) - KSV.sv8

Profile Summary - Product Probe Interface

Scan Rate: 1.0 sec
Start Time: August 30, 2016 10:21
Duration: 19m 00.0s
Number of Samples: 1140 (2.0" between samples)
Max Profile Int. Temp.: 98.1°F @ 00:19:00.0+

SV8 Version: 161102.01
Belt Speed: 9.8 ft/min
Data Trimming: 00:02:36.0 Start
00:21:36.0 Finish
User: R. J. Starke

Notes: Basket Carrier and THB80 used.

SCORPION® 2

Serial Number: 10088
Version: 12.15.05
Calibration Date: August 11, 2016
Max. Temp Reached: 127.2°F (March 22, 2016 14:33:00)
Owner Information: Reading Thermal
Richard Starke

SMART SENSOR - 2 Sensor Temperature, 1 Sensor Air Velocity, 2 Sensor PPI, Heat Flux Sensor

Serial Number: 5171
Version: 2
Calibration Date: August 10, 2016
Length: 10.0 in

Owner Information: Richard Starke
Reading Thermal

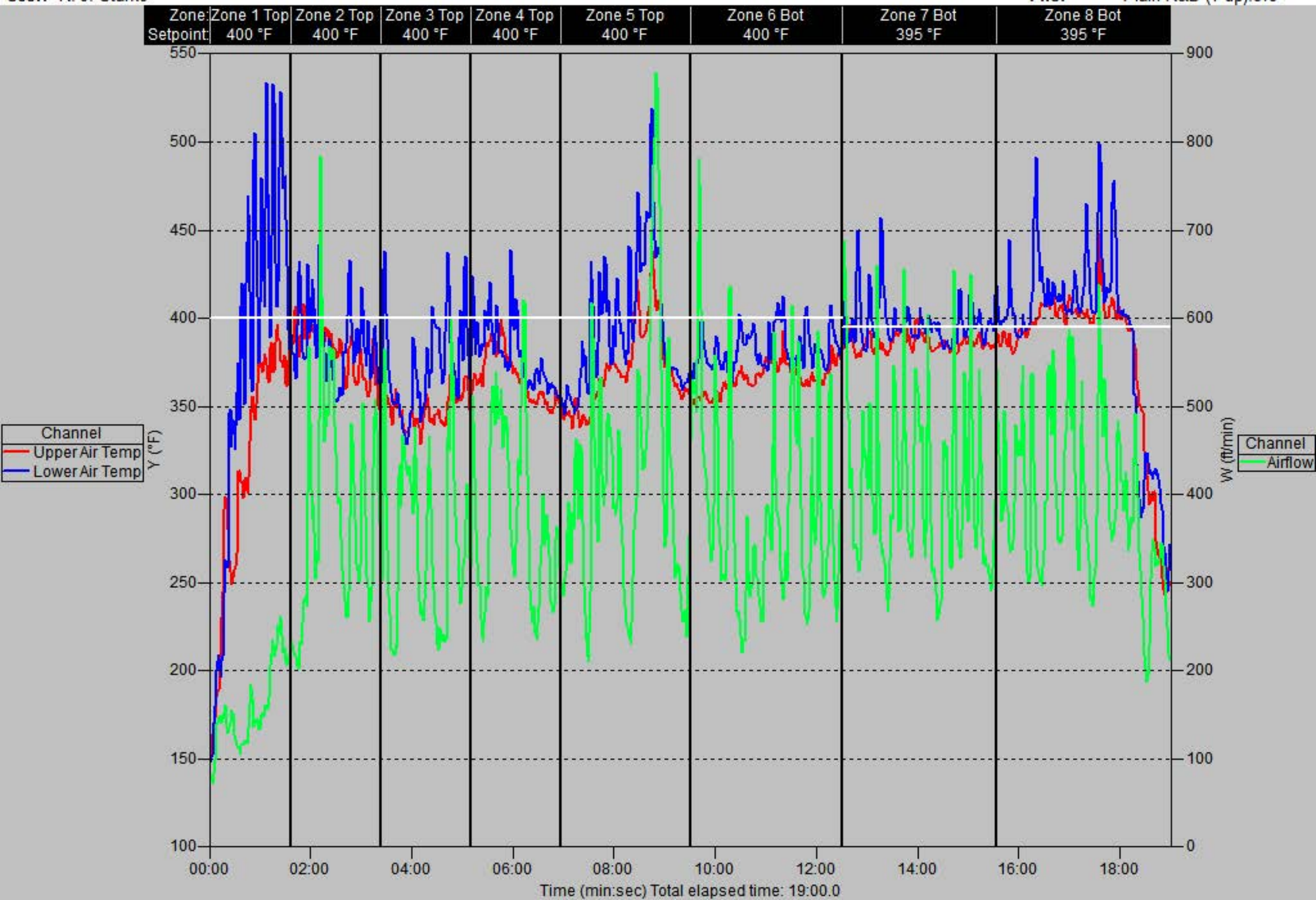
READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 10:21
User: R. J. Starke

Overlay

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain R&D (T up).sv8



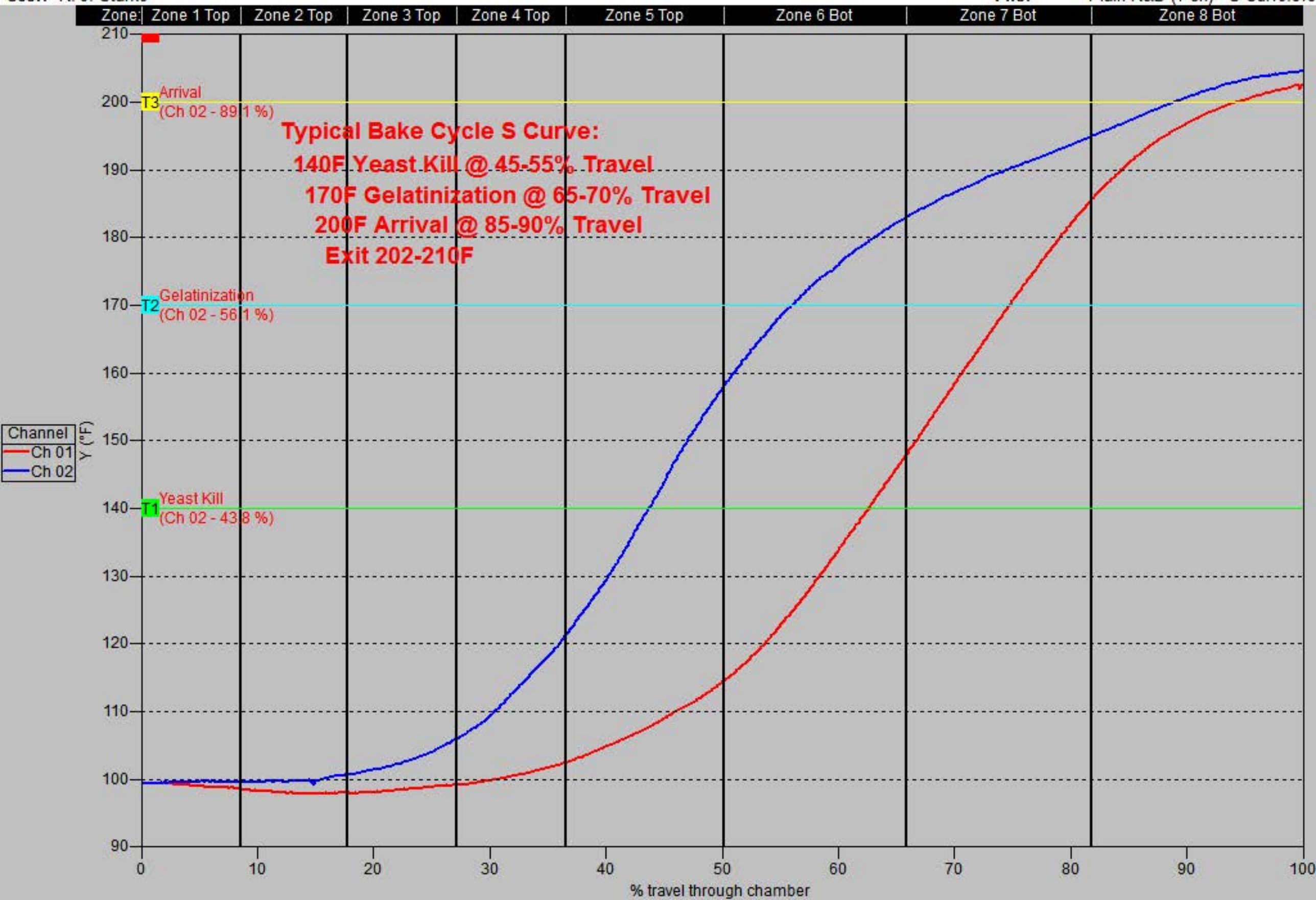
READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 10:21
User: R. J. Starke

R&D Smart Sensor - Bake Cycle S-Curve

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain R&D (T ch) - S-Curve.sv8



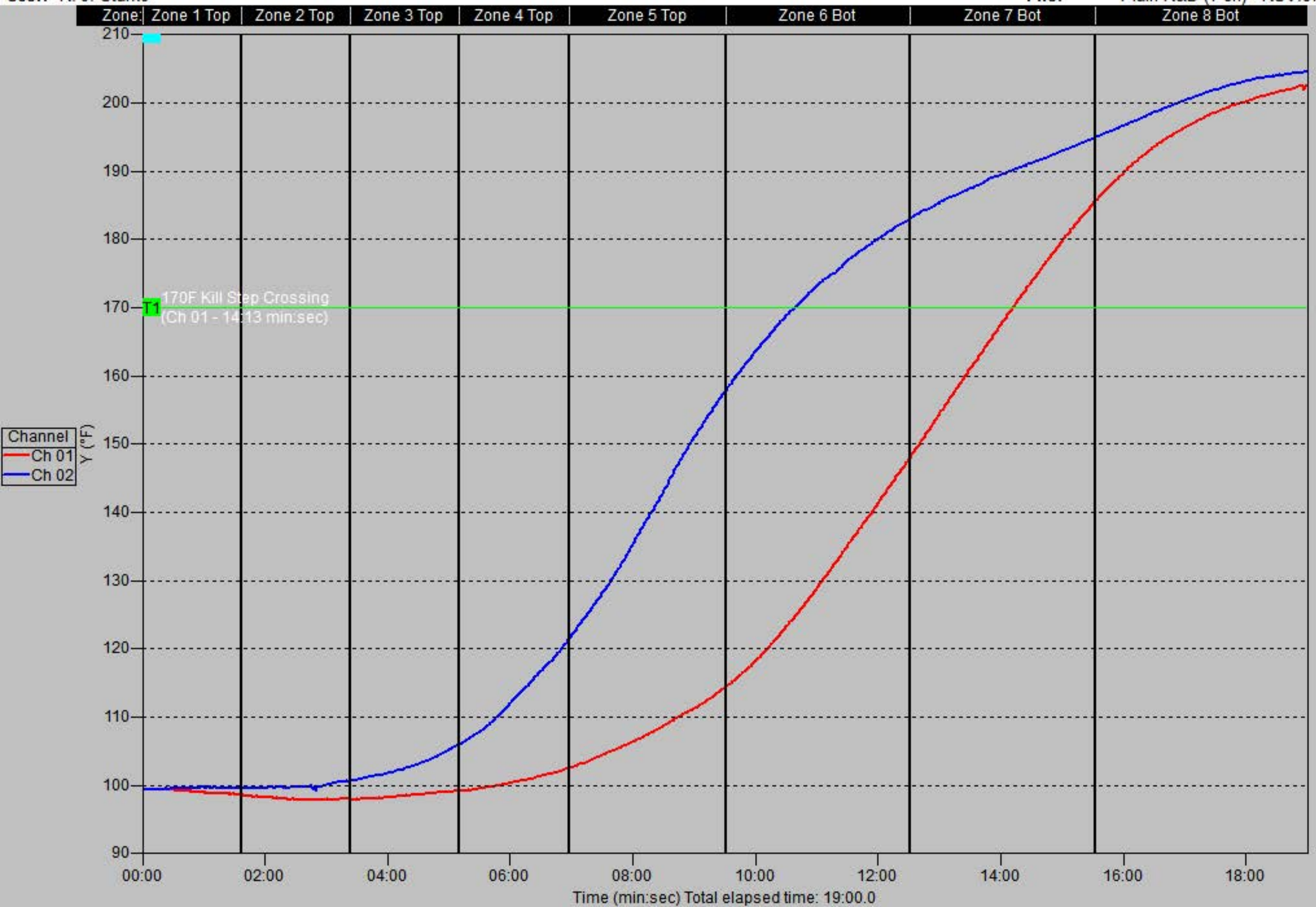
READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 10:21
User: R. J. Starke

R&D Smart Sensor - Kill Step Validation

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain R&D (T ch) - KSV.sv8



Food Safety - Process Lethality Report

Process Configuration:

Company Name:	Reading Thermal
Process Name:	Bread Oven + Plain Bread
Process Address:	Bread Plant
Product Name:	Plain Bread
Process Notes:	63 Trays, 108 Burners, 8 Zones. Trays are 32" deep. Headroom is 5.5" plus.
Manufacturer:	Baker Perkins
Model/Serial#:	970
Equip. Type:	DGF Lap Oven
Profile File Name:	Plain R&D (T ch) - KSV.sv8
User:	R. J. Starke
Start Time:	August 30, 2016 10:21
# of Samples:	1140 Scan Rate: 1.0
Duration of Proc:	19m 00.0
Channel:	Ch 01

Process Data: [20 Blocks of Data Points - Averaged]

Time (min)	Core Temp (°F)	F Value (min)	Log Reduction	Cum. Log Reductions
0.93	99.12	0.00	0.00	0.00
1.88	98.51	0.00	0.00	0.00
2.83	97.88	0.00	0.00	0.00
3.78	97.80	0.00	0.00	0.00
4.73	98.31	0.00	0.00	0.00
5.68	99.12	0.00	0.00	0.00
6.63	100.53	0.00	0.00	0.00
7.58	102.94	0.00	0.00	0.00
8.53	106.57	0.01	0.00	0.00
9.48	111.32	0.02	0.00	0.00
10.43	117.95	0.07	0.01	0.01
11.38	127.82	0.51	0.05	0.06
12.33	139.54	5.07	0.52	0.59
13.28	151.80	56.12	5.79	6.37
14.23	164.27	647.77	66.78	73.15
15.18	176.17	6,692.17	689.91	763.07
16.13	186.50	50,740.29	5,230.96	5,994.03
17.08	193.99	220,352.80	22,716.78	28,710.81
18.03	198.63	547,172.67	56,409.55	85,120.36
18.98	201.38	938,449.99	96,747.42	181,867.78
	SUM:	**1,764,117.5**	**181,867.8**	

Microorganism:

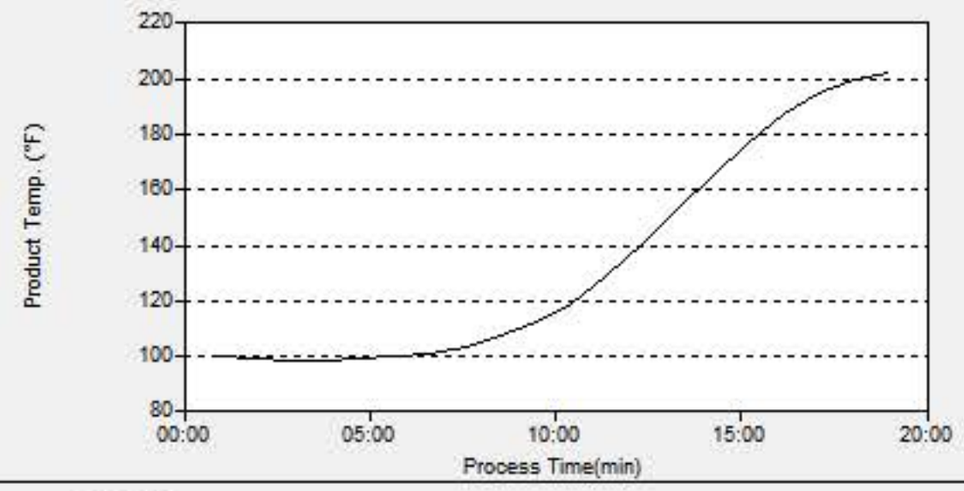
Zone Name	Microorganism	Tref(°F)	D(min)	z(°F)	a_w
All Data	Salmonella spp.	131.0	9.70	11.74	
	100% Whole Wheat Multigrain Bread - Channaiah et al. 2015				

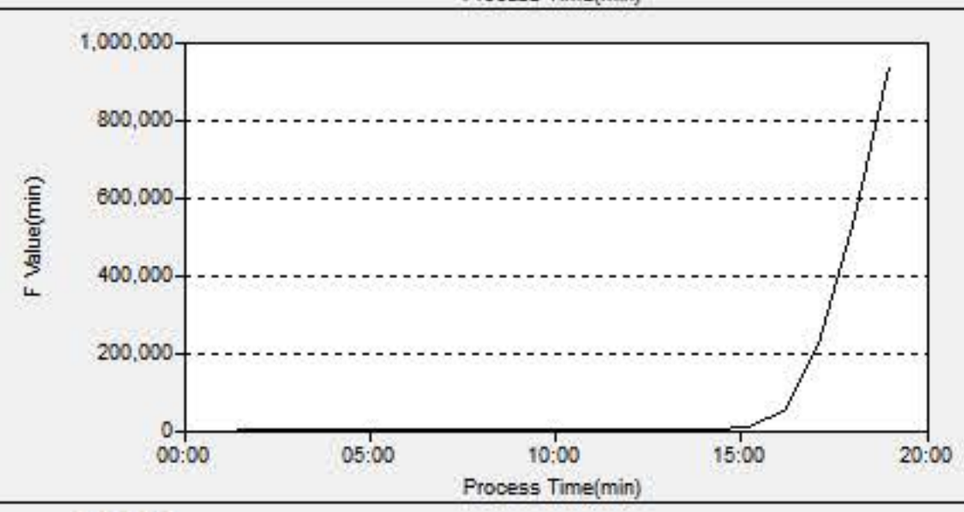
Process Lethality:

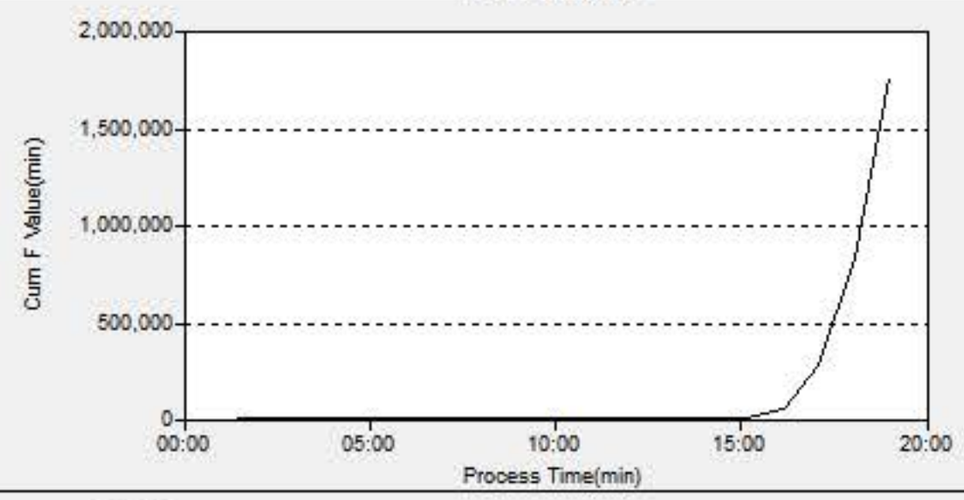
Cum. Log Reductions: >12 [All 1140 Data Points]

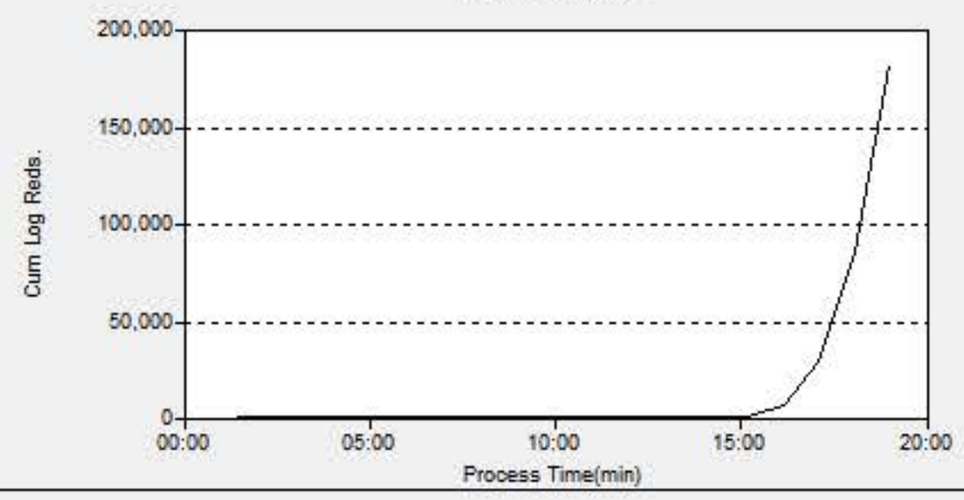
Cum. Log Reductions: >12 [20 Blocks of Data Points - Average - from 1140 sample points]

Graphs: [20 Blocks of Data Points - Averaged]









Profile Notes/Justification

Basket Carrier and THB80 used.

Definitions

T ref: The reference temperature used when establishing the D and z values.

D-value: The time, in minutes, at an associated T ref to kill 90% of a selected microorganism; a one log reduction.

z-value: The temperature increase required to change the D-value by a factor of ten.

F-value: The process lethality. The equivalent time, in minutes, of heating at a reference temperature (T ref).

Equations Used:

$$\text{F-value} = 10^{\frac{(T_{core} - T_{ref})}{z}} * \Delta t$$

$$\text{Log Reduction} = \frac{\text{F-value}}{D}$$

$$\text{Process Lethality (D-Reductions)} = \frac{\Sigma \text{ F-Value}}{D}$$

Calculations for lethality based on the General Method

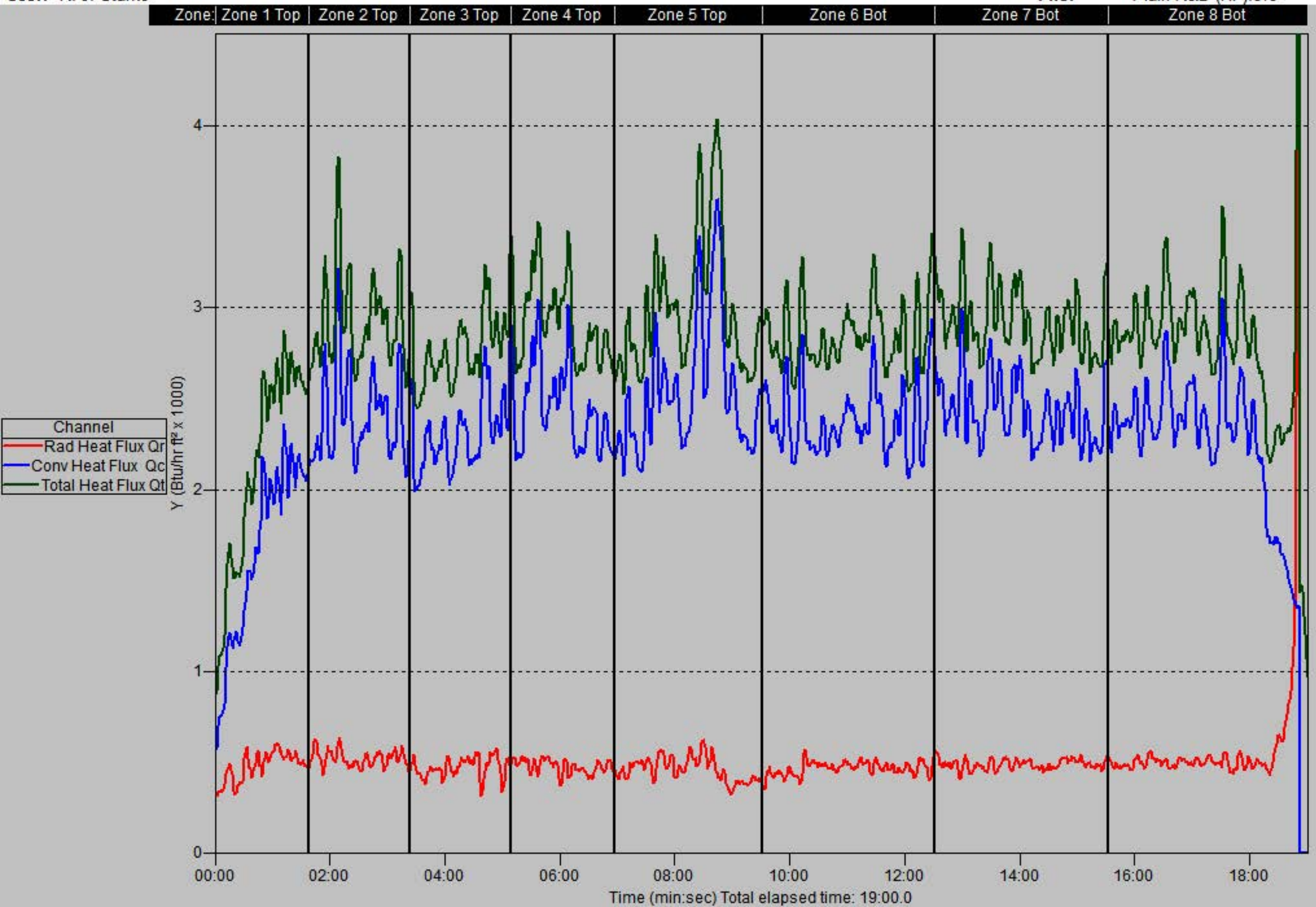
READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 10:21
User: R. J. Starke

R&D Smart Sensor - Convective and Radiant Heat Flux

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain R&D (HF).sv8



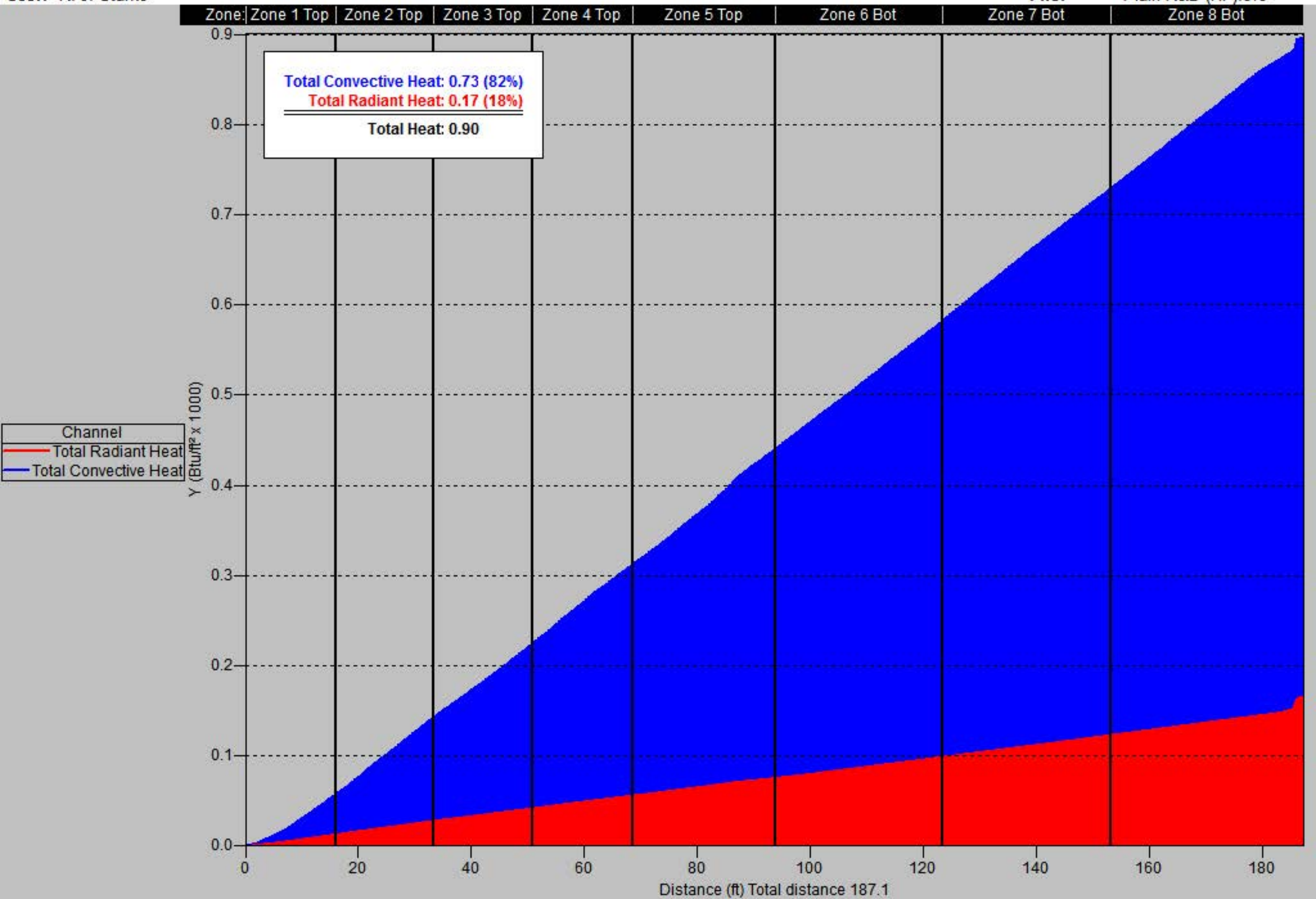
READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 10:21
User: R. J. Starke

R&D Smart Sensor - Total Convective and Radiant Heat

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain R&D (HF).sv8



READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 11:08
User: R. J. Starke

Profile Summary

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain T+A (AV).sv8

Profile Summary - Air Velocity

Scan Rate: 1.0 sec
Start Time: August 30, 2016 11:08
Duration: 19m 49.0s
Number of Samples: 1189 (1.9" between samples)
Max Profile Int. Temp.: 111.9°F @ 00:19:49.0+

SV8 Version: 161102.01
Belt Speed: 9.4 ft/min
Data Trimming: 00:00:53.0 Start
00:20:42.0 Finish
User: R. J. Starke

Notes: Basket Carrier and THB80 used.

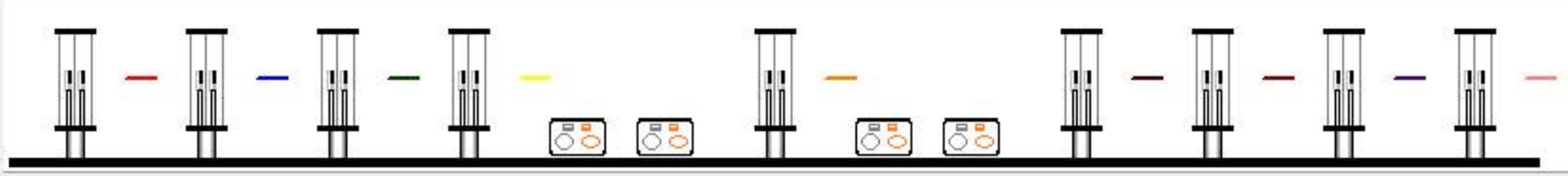
SCORPION® 2

Serial Number: 10088
Version: 12.15.05
Calibration Date: August 11, 2016
Max. Temp Reached: 127.2°F (March 22, 2016 14:33:00)
Owner Information: Reading Thermal
Richard Starke

SMART SENSOR - 9 Sensor Temperature, 9 Sensor Air Velocity, 4 Sensor PPI

Serial Number: 5586
Version: 1
Calibration Date: April 12, 2016
Length: 138.0 in

Owner Information: Reading Thermal
Sinking Spring, PA



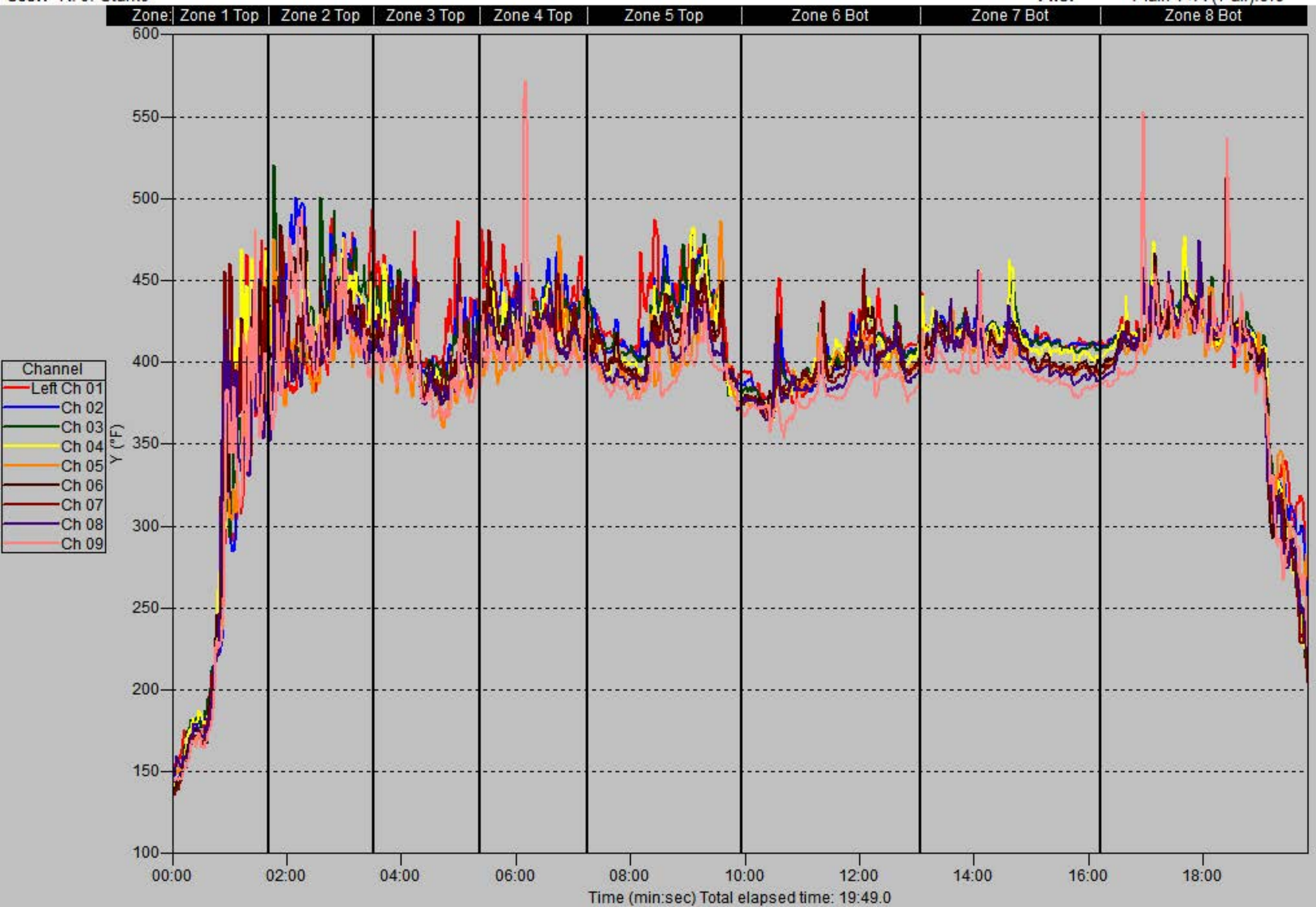
READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 11:08
User: R. J. Starke

Temp+Airflow Sensor Array (11'6") - 2D Line - Temperature

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain T+A (T air).sv8



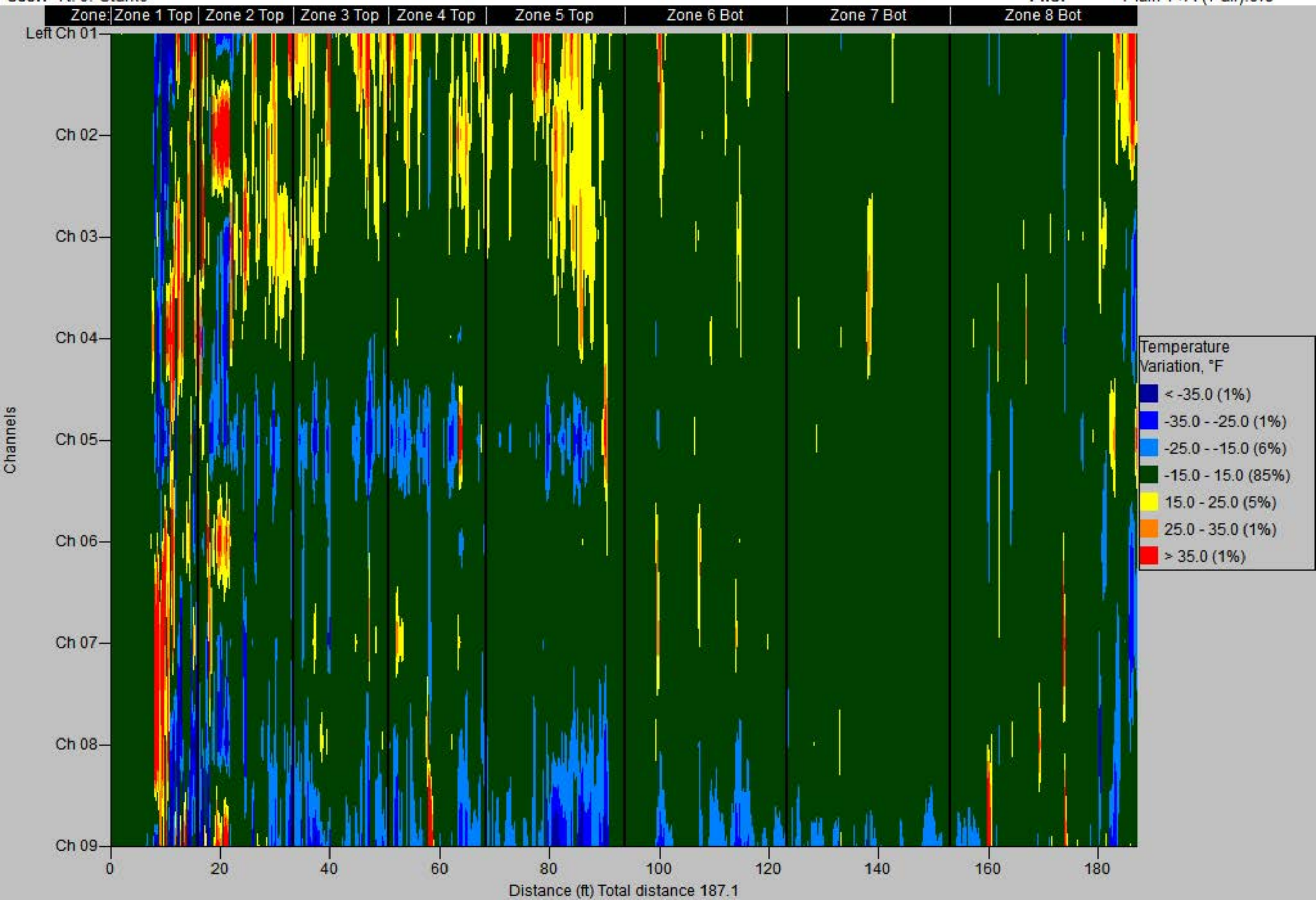
READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 11:08
User: R. J. Starke

Temp+Airflow Sensor Array (11'6") - 2D Contour - +-15F - Temperature

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain T+A (T air).sv8



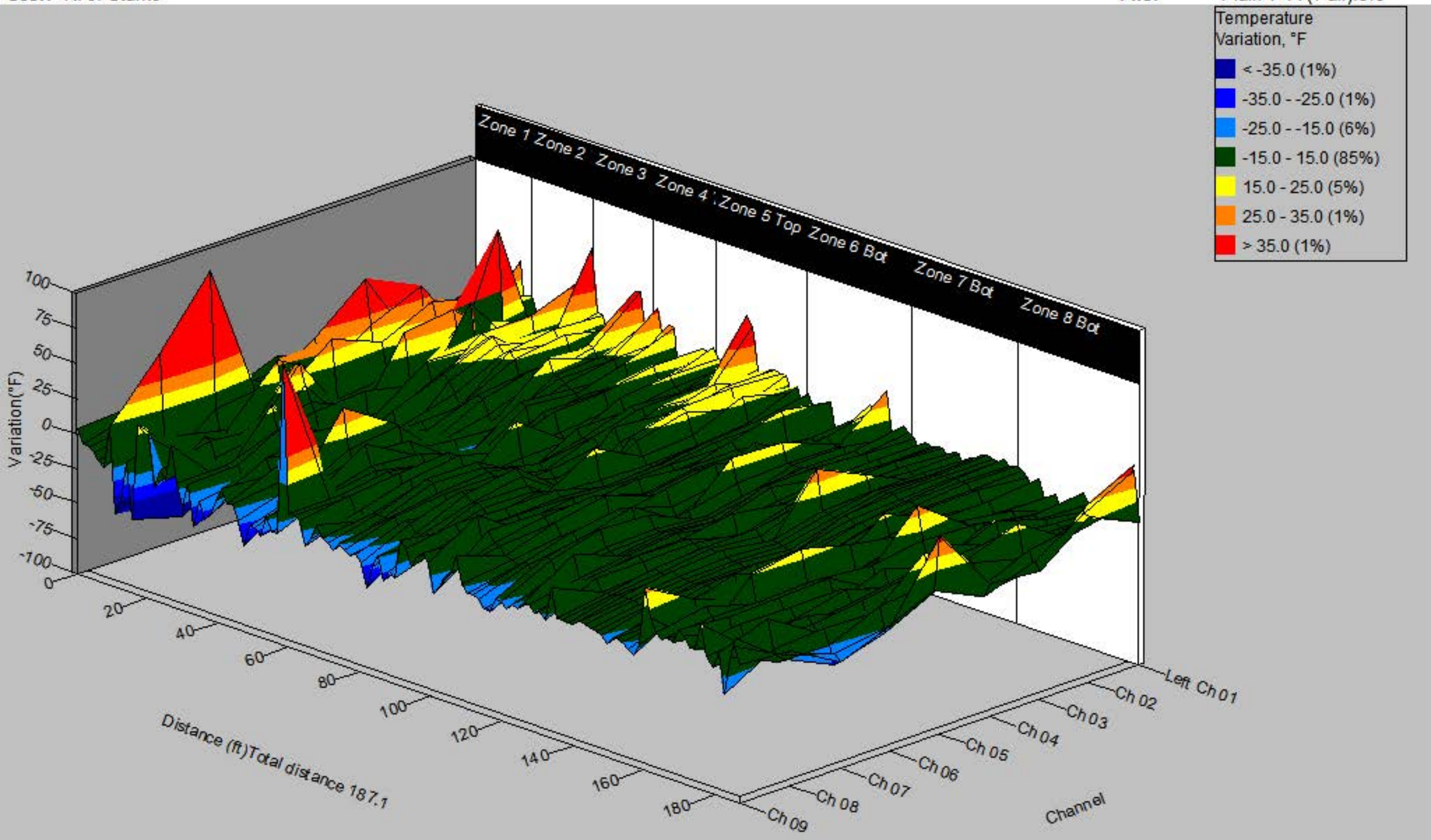
READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 11:08
User: R. J. Starke

Temp+Airflow Sensor Array (11'6") - 3D Mesh - +-15F - Temperature

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain T+A (T air).sv8



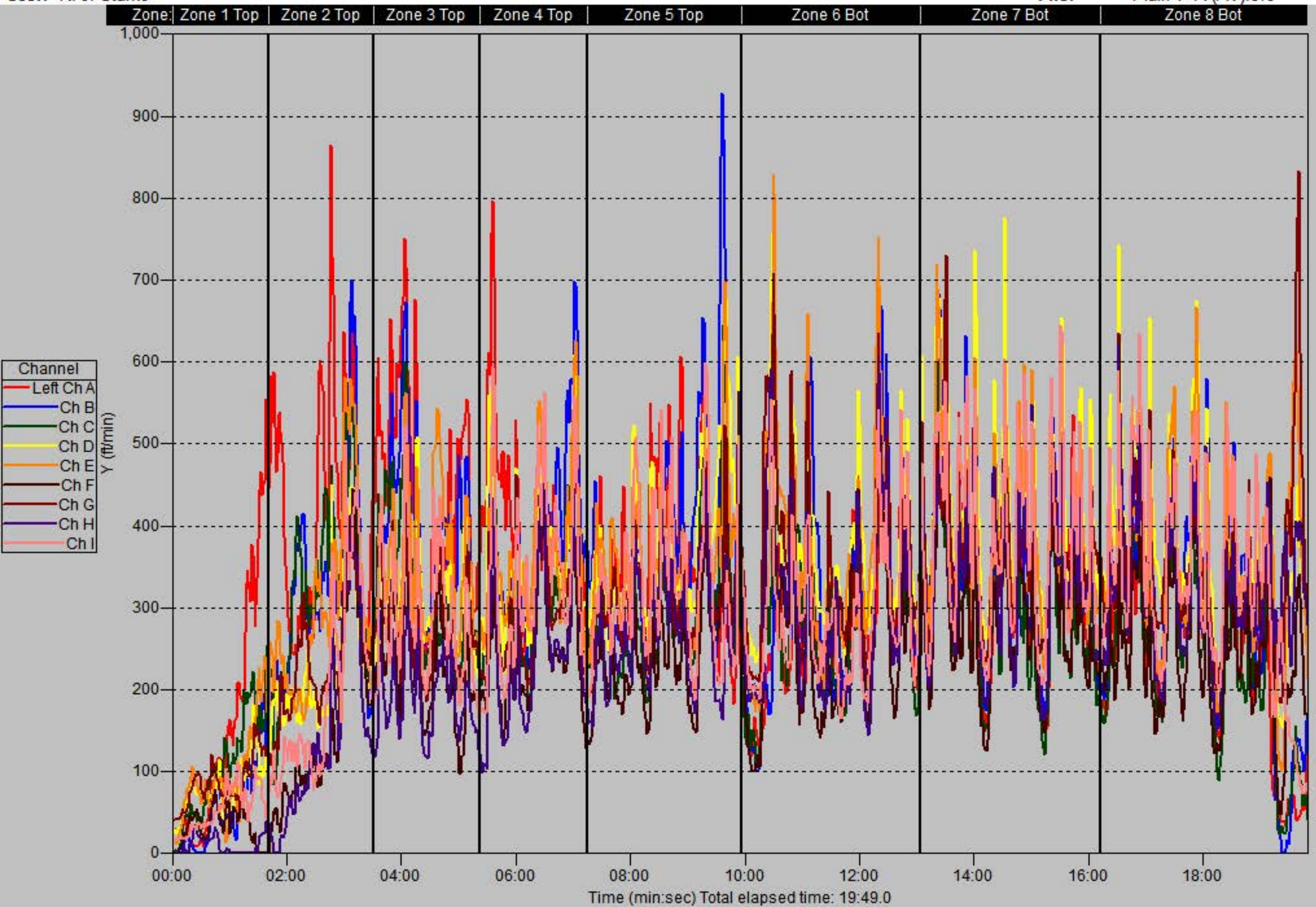
READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 11:08
User: R. J. Starke

Temp+Airflow Sensor Array - 2D Line - Airflow Above Conveyor

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain T+A (AV).sv8



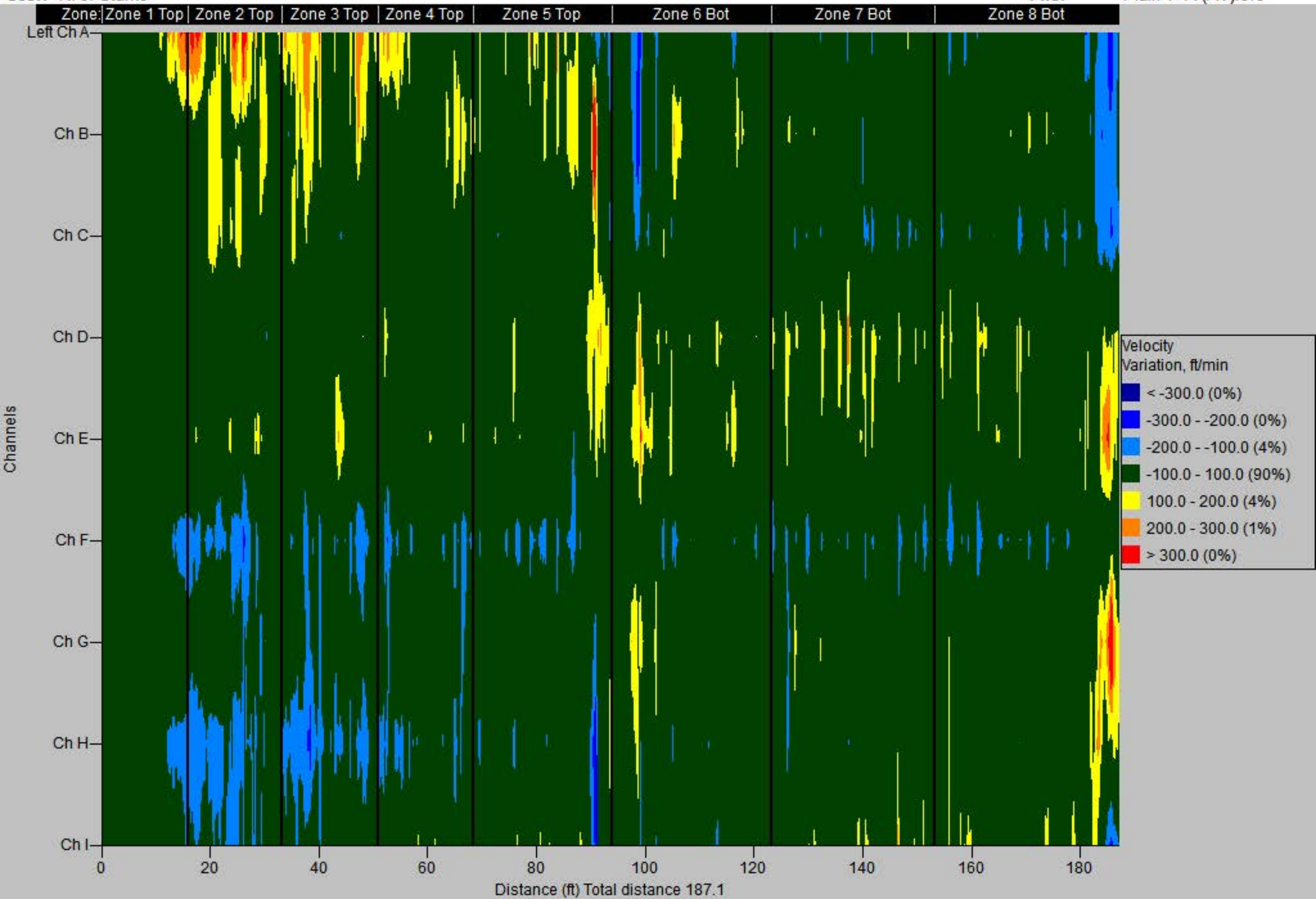
READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 11:08
User: R. J. Starke

Temp+Airflow Sensor Array - 2D Contour - Airflow Above Conveyor +-100fpm

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain T+A (AV).sv8



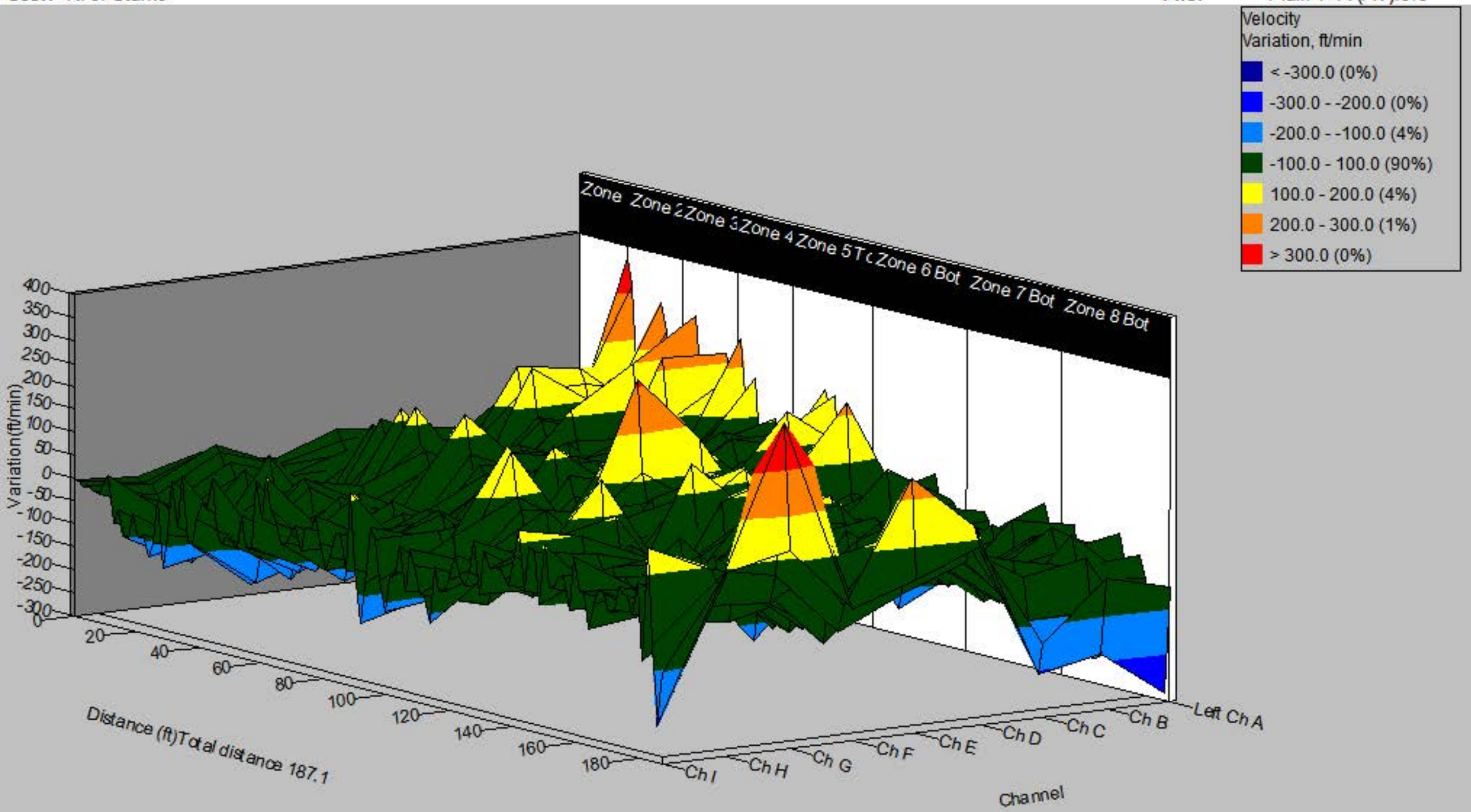
READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 11:08
User: R. J. Starke

Temp+Airflow Sensor Array - 3D Mesh - Airflow Above Conveyor +-100fpm

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain T+A (AV).sv8



READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 14:06
User: R. J. Starke

Profile Summary

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain (HU).sv8

Profile Summary - Humidity

Scan Rate: 1.0 sec
Start Time: August 30, 2016 14:06
Duration: 19m 34.0s
Number of Samples: 1174 (1.9" between samples)
Max Profile Int. Temp.: 100.9°F @ 00:19:34.0+

SV8 Version: 161102.01
Belt Speed: 0.0 ft/min
Data Trimming: 00:00:33.0 Start
00:20:07.0 Finish
User: R. J. Starke

Notes: Basket Carrier and THB80 used.

SCORPION® 2

Serial Number: 10088
Version: 12.15.05
Calibration Date: August 11, 2016
Max. Temp Reached: 127.2°F (March 22, 2016 14:33:00)
Owner Information: Reading Thermal
Richard Starke

SMART SENSOR - Humidity Sensor

Serial Number: 5172
Version: 1
Calibration Date: August 11, 2016
Length: 0.0 in

Owner Information: Richard Starke
Reading Thermal
Sinking Spring, PA

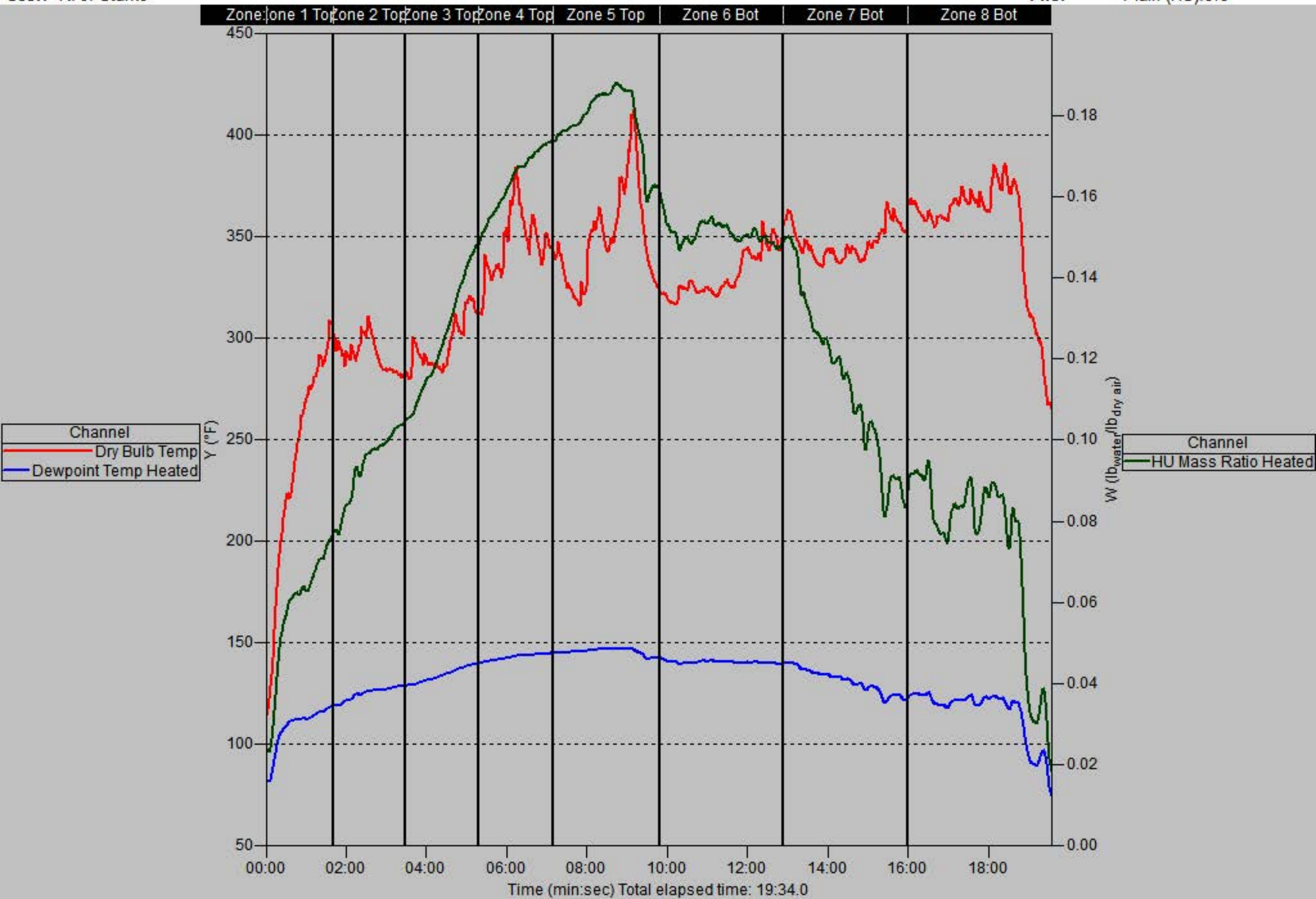
READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 14:06
User: R. J. Starke

Humidity Sensor - Absolute Humidity - Heating Process

Process: Bread Oven + Plain Bread
Product: Plain Bread
File: Plain (HU).sv8



READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 15:28
User: R. J. Starke

Process: Bread Oven + Prem
Product: Prem
File: T04 Prem Family 16oz Damp Open (HU).sv8

Process Summary

Process Name: Bread Oven + Prem
Product Name: Prem
Process Notes: Damper at back of oven open (normal) position
Basket Carrier and HUTHB100 used.
Equipment Type: DGF Lap Oven
Manufacturer: Baker Perkins
Model #/Serial #: 970 / ??

Company Name: Reading Thermal
Process Address: Bread Plant
Location Altitude (ft) 675.0 **Atm. Pres (KPa):** 98.7259
Conveyor Type: Tray Conveyor
Conveyor Width: 148" or 12'4" Trays
Heat Tolerance Coef. AIB 160727 - Whole Wheat Bread - Salmonella

Zone	Length (ft)	Name	Temp Setpoint (°F)	Exhaust % Open	Notes	
1	16.1	Zone 1 Top	385.0	0		
2	17.4	Zone 2 Top	395.1	0		
3	17.4	Zone 3 Top	395.1	0		
4	17.7	Zone 4 Top	399.9	0		
5	25.3	Zone 5 Top	399.9	0		
6	29.5	Zone 6 Bot	399.9	0		
7	29.9	Zone 7 Bot	395.1	0		
8	34.1	Zone 8 Bot	385.0	0		
9	187.4 total					

READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 15:28
User: R. J. Starke

Profile Summary

Process: Bread Oven + Prem
Product: Prem
File: Premium Damp Open (HU).sv8

Profile Summary - Humidity

Scan Rate: 1.0 sec
Start Time: August 30, 2016 15:28
Duration: 18m 03.0s
Number of Samples: 1083 (2.1" between samples)
Max Profile Int. Temp.: 114.6°F @ 00:18:03.0+

SV8 Version: 161102.01
Belt Speed: 10.4 ft/min
Data Trimming: 00:00:42.0 Start
00:18:45.0 Finish
User: R. J. Starke

Notes: Damper at back of oven open (normal) position.
Basket Carrier and HUTHB100 used.

SCORPION® 2

Serial Number: 10088
Version: 12.15.05
Calibration Date: August 11, 2016
Max. Temp Reached: 127.2°F (March 22, 2016 14:33:00)
Owner Information: Reading Thermal
Richard Starke

SMART SENSOR - Humidity Sensor

Serial Number: 5172
Version: 1
Calibration Date: August 11, 2016
Length: 0.0 in

Owner Information: Richard Starke
Reading Thermal
Sinking Spring, PA

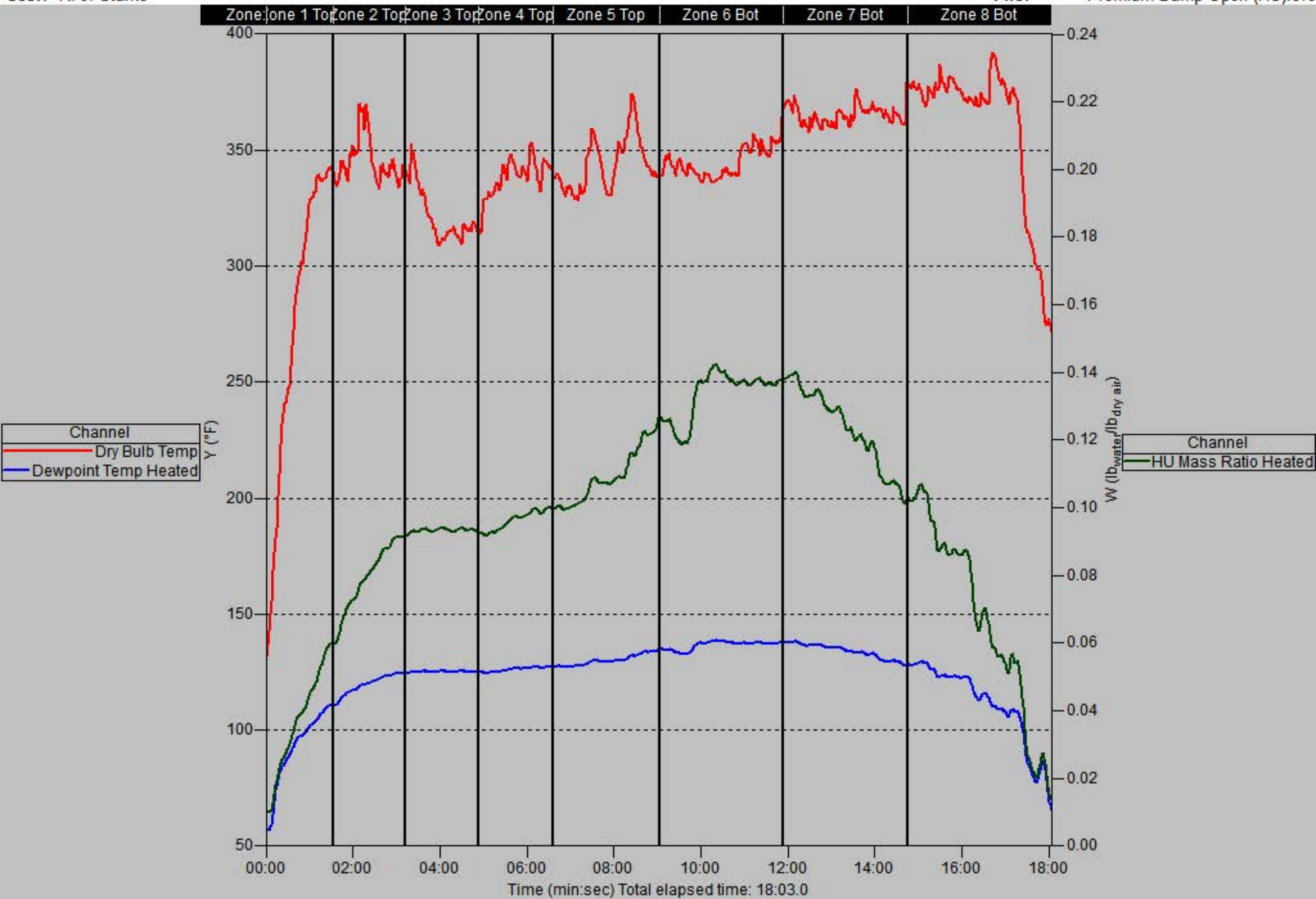
READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 15:28
User: R. J. Starke

Process: Bread Oven + Prem
Product: Prem
File: Premium Damp Open (HU).sv8

Humidity Sensor - Absolute Humidity - Heating Process - Damper OPEN



READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 16:01
User: R. J. Starke

Profile Summary

Process: Bread Oven + Prem
Product: Prem
File: Premium Damp Closed (HU).sv8

Profile Summary - Humidity

Scan Rate: 1.0 sec
Start Time: August 30, 2016 16:01
Duration: 18m 03.0s
Number of Samples: 1083 (2.1" between samples)
Max Profile Int. Temp.: 116.9°F @ 00:18:03.0+

SV8 Version: 161102.01
Belt Speed: 10.4 ft/min
Data Trimming: 00:00:32.0 Start
00:18:35.0 Finish
User: R. J. Starke

Notes: Damper at back of oven closed (abnormal position).
Basket Carrier and HUTHB100 used.

SCORPION® 2

Serial Number: 10088
Version: 12.15.05
Calibration Date: August 11, 2016
Max. Temp Reached: 127.2°F (March 22, 2016 14:33:00)
Owner Information: Reading Thermal
Richard Starke

SMART SENSOR - Humidity Sensor

Serial Number: 5172
Version: 1
Calibration Date: August 11, 2016
Length: 0.0 in

Owner Information: Richard Starke
Reading Thermal
Sinking Spring, PA

READING THERMAL

SCORPION® SV8

Date: August 30, 2016
Time: 16:01
User: R. J. Starke

Process: Bread Oven + Prem
Product: Prem
File: Premium Damp Closed (HU).sv8

Humidity Sensor - Absolute Humidity - Heating Process - Damper CLOSED