

NASA Langley Research Center

ENGINEERING DIRECTORATE

Introduction to FilePlottingTools

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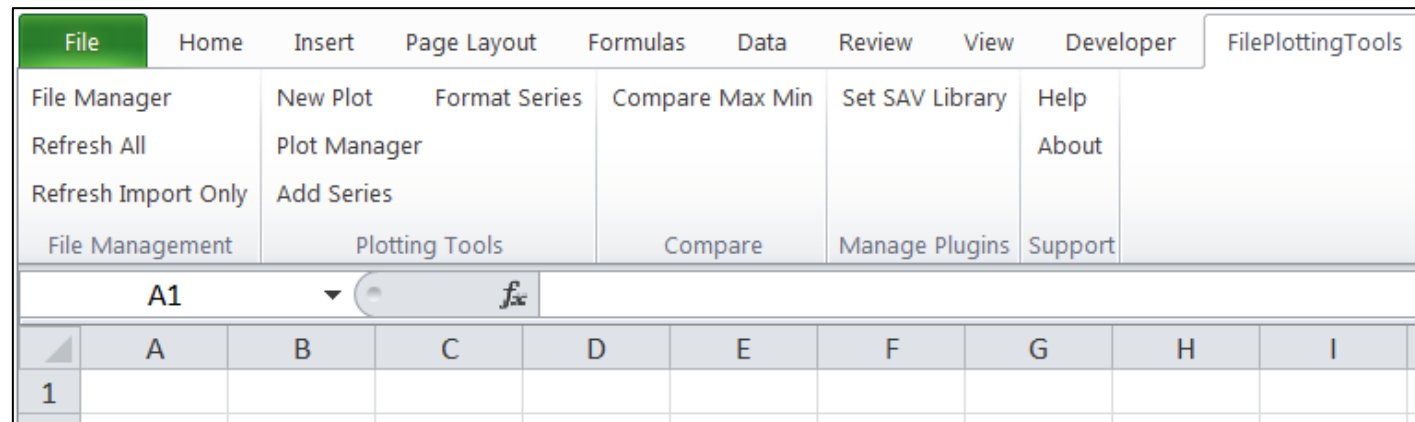
December 11, 2024

Agenda

- What is FilePlottingTools (FPT)?
- Data Import
- Plotting
- Data Processing
- User's Manual
- Demonstration

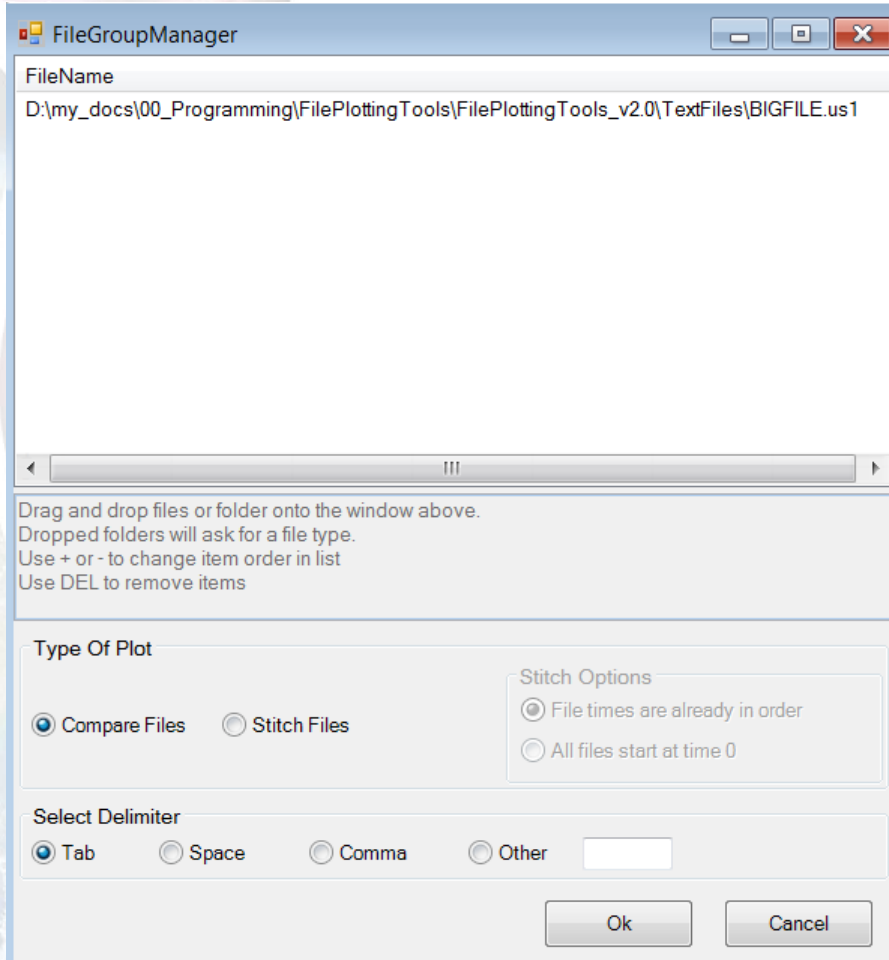
What is FilePlottingTools (FPT)?

- Results-processing tool for Thermal Desktop™ users
 - Simplifies the processing of results
 - Enhances capabilities for plotting, unit conversion, limit-checking, and comparing data across multiple cases
 - Handles delimited text files containing time vs. temperature data as well as .sav files from Thermal Desktop™
- Excel® plug-in developed in Visual Basic by NASA Langley Research Center / Structural and Thermal Systems Branch
 - Originally developed by Tory Scola in 2012 and approved for release in 2013; used extensively by thermal analysts at Langley since its inception
 - Updated for compatibility with 64-Bit Excel® in May 2023 and approved for public release in August 2024
- Can be downloaded from the NASA Software Catalog: <https://software.nasa.gov/software/LAR-20449-1>
 - Installation files include a user's manual that provides installation instructions, description of key functions, and troubleshooting guide



Data Import

File Group Manager
*Import .sav or text files
(text file shown)*



FileGroupManager

FileName
D:\my_docs\00_Programming\FilePlottingTools\FilePlottingTools_v2.0\TextFiles\BIGFILE.us1

Drag and drop files or folder onto the window above.
Dropped folders will ask for a file type.
Use + or - to change item order in list
Use DEL to remove items

Type Of Plot

☒ Compare Files ☐ Stitch Files

Stitch Options

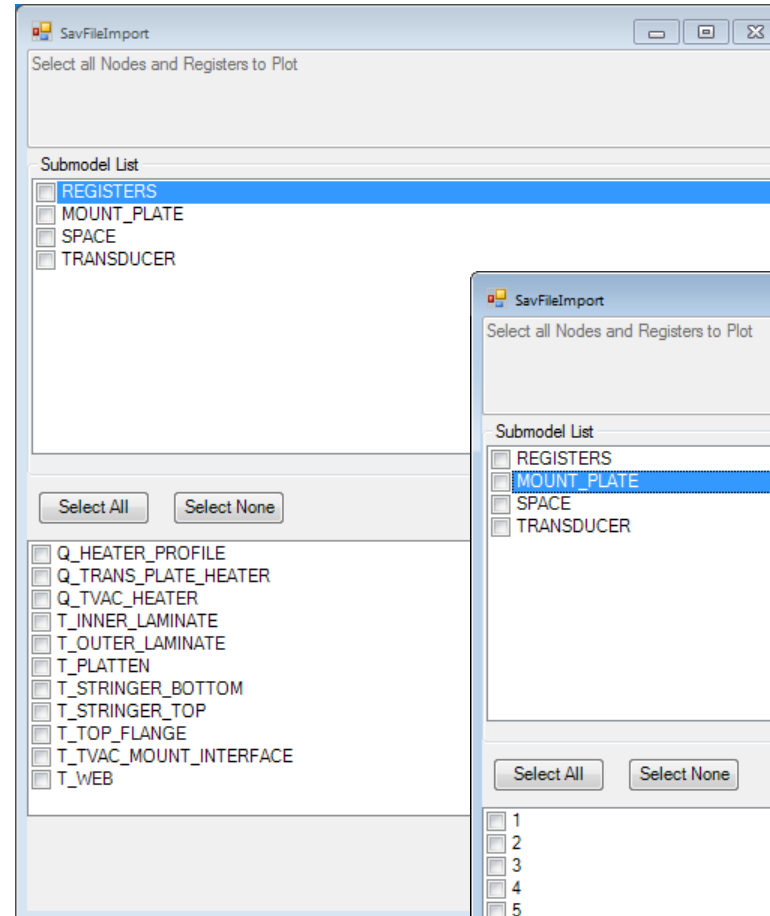
☒ File times are already in order
☐ All files start at time 0

Select Delimiter

☒ Tab ☐ Space ☐ Comma ☐ Other

Ok Cancel

SAV File Import
*Select registers and nodes
from a sav file*



SavFileImport

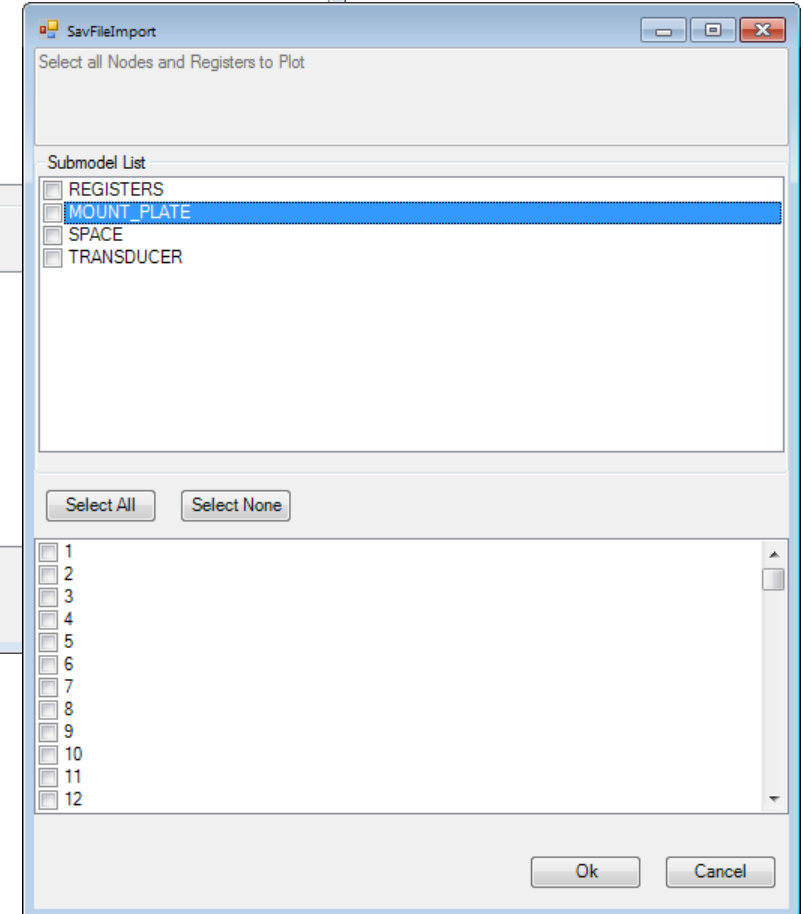
Select all Nodes and Registers to Plot

Submodel List

- ☒ REGISTERS
- ☐ MOUNT_PLATE
- ☐ SPACE
- ☐ TRANSDUCER

Select All Select None

- ☐ Q_HEATER_PROFILE
- ☐ Q_TRANS_PLATE_HEATER
- ☐ Q_TVAC_HEATER
- ☐ T_INNER_LAMINATE
- ☐ T_OUTER_LAMINATE
- ☐ T_PLATTEN
- ☐ T_STRINGER_BOTTOM
- ☐ T_STRINGER_TOP
- ☐ T_TOP_FLANGE
- ☐ T_TVAC_MOUNT_INTERFACE
- ☐ T_WEB



SavFileImport

Select all Nodes and Registers to Plot

Submodel List

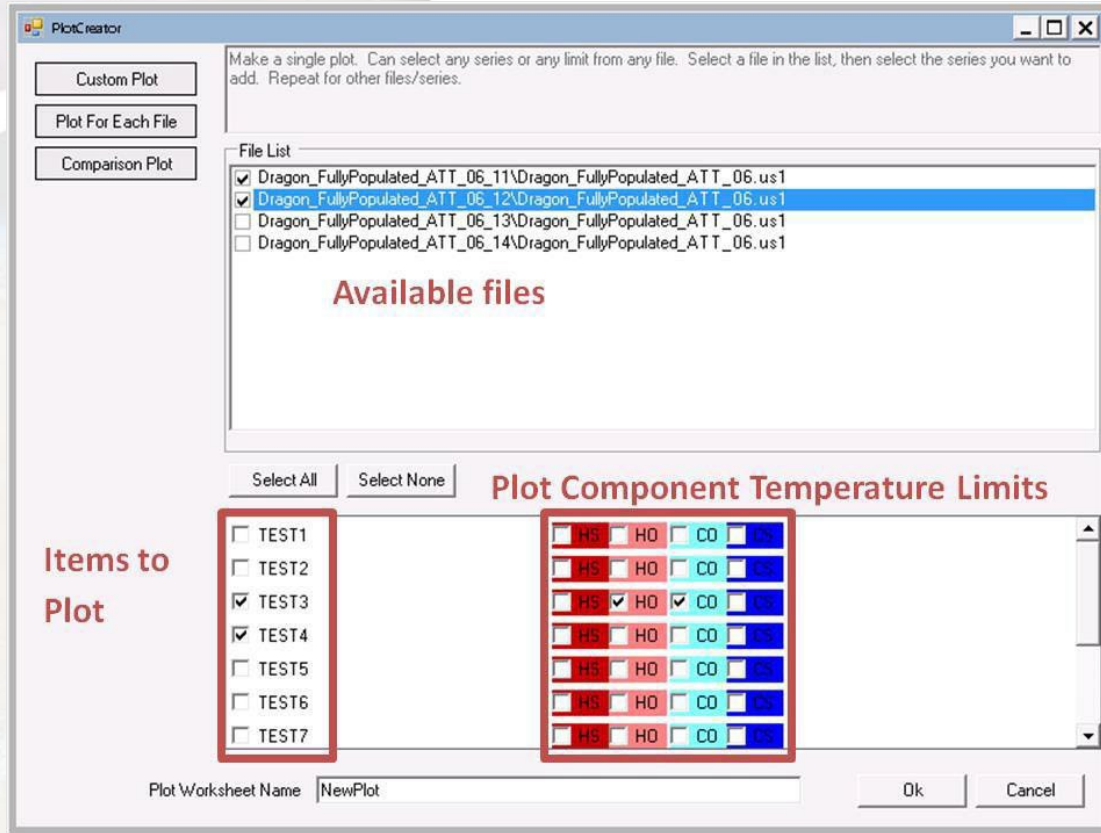
- ☐ REGISTERS
- ☒ MOUNT_PLATE
- ☐ SPACE
- ☐ TRANSDUCER

Select All Select None

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10
- ☐ 11
- ☐ 12

Ok Cancel

Plotting (1 of 2)



Plot Creator
Select data and plot type

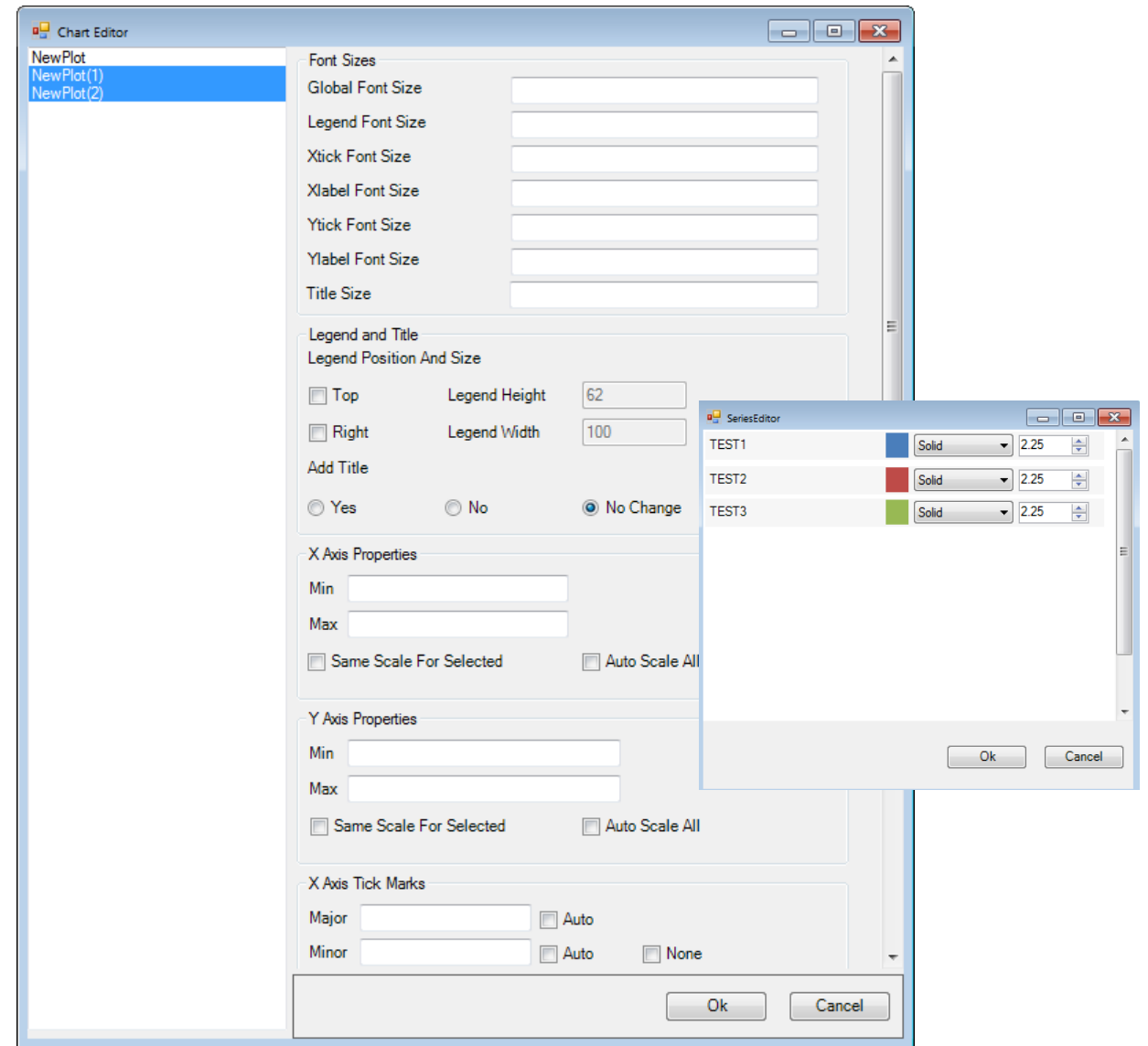
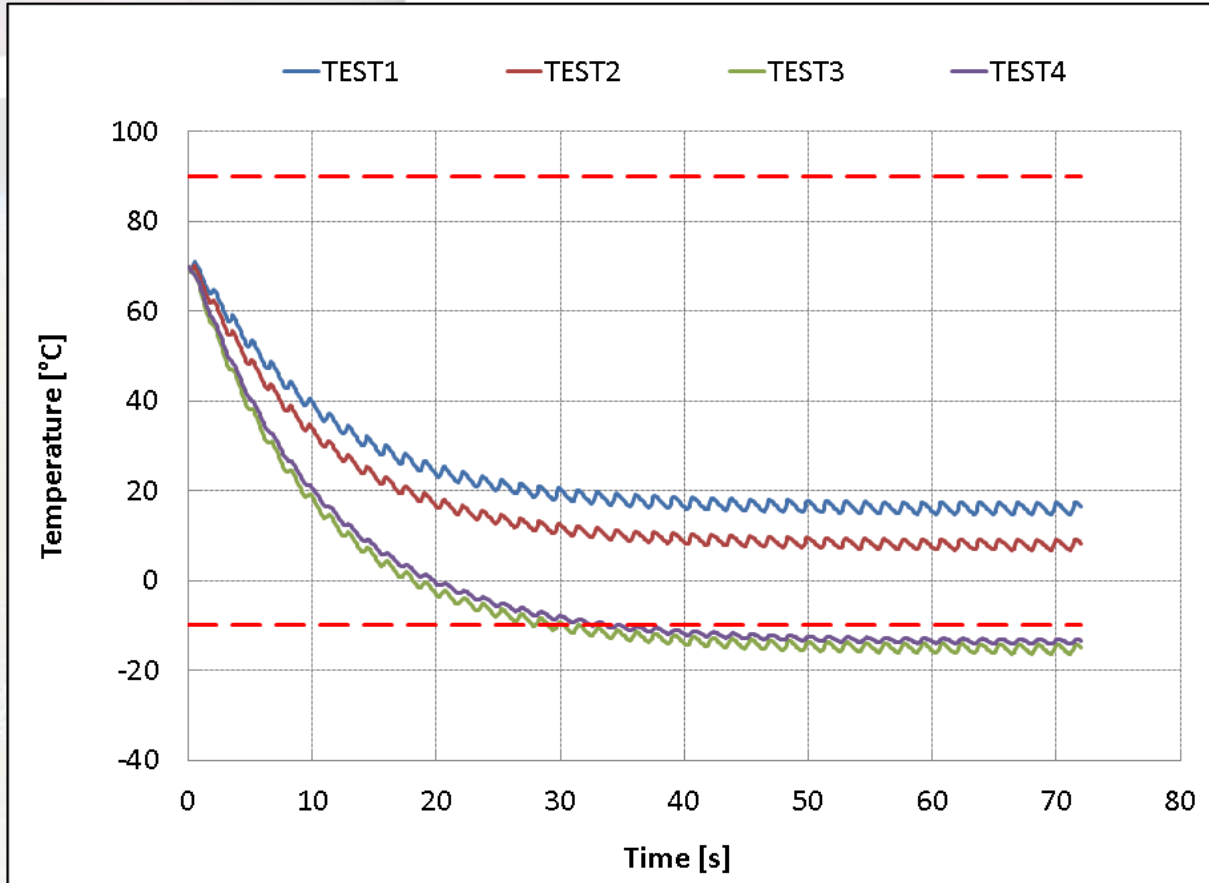
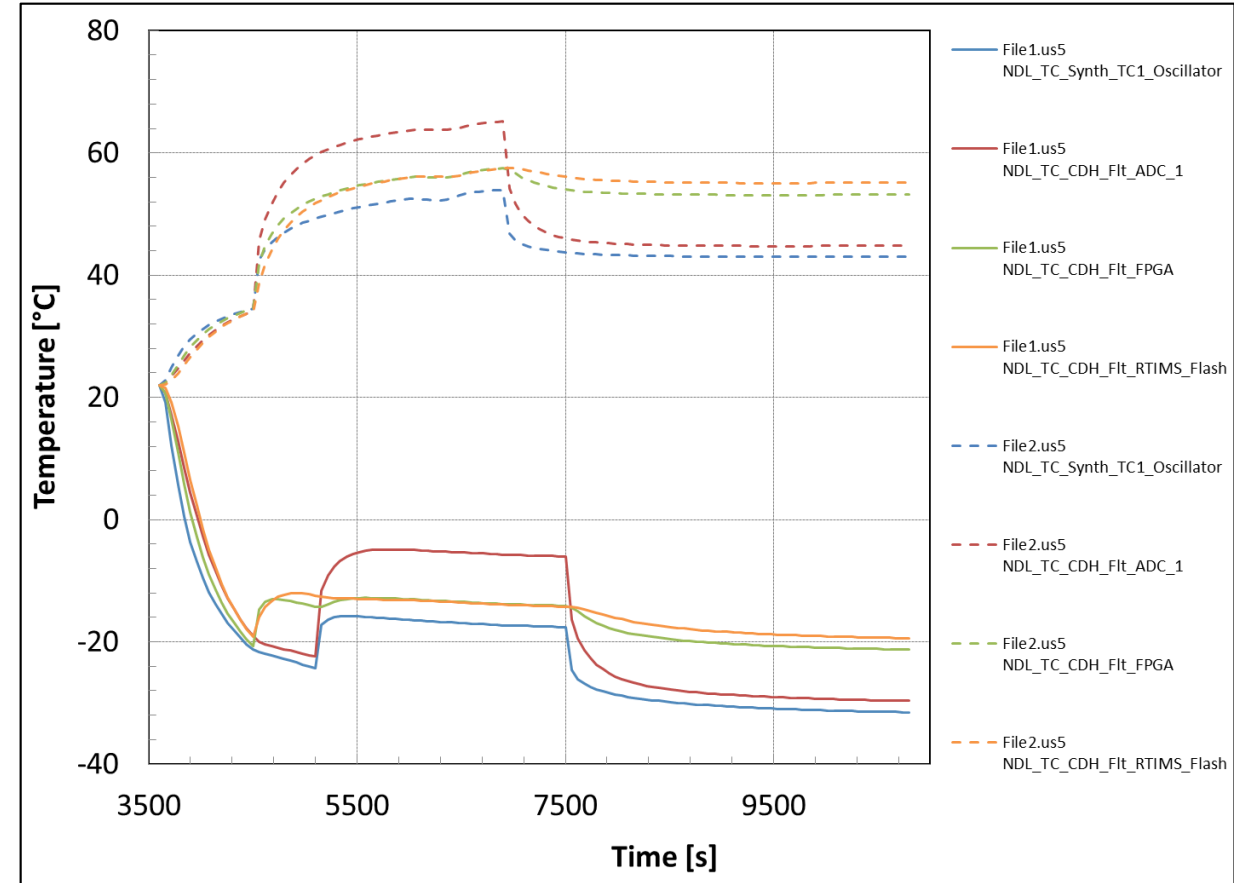


Chart Editor
Modify plot styles

Plotting (2 of 2)



Plot with limits



Comparison Plot

Data Processing

AutoSave Off Book1 - Excel Search (Alt+Q)

File Home Insert Page Layout Formulas Data Review View Developer Help FilePlottingTools TDBOARDGen

File Manager New Plot Format Series Compare Max Min Set SAV Library Help
Refresh All Plot Manager
Refresh Import Only Add Series
File Management Plotting Tools Compare Manage Plugins Support

Unit Conversion

	From:	To:	Chart Axis Labels:
1 Time Convert	s	s	Time [s]
2 Temp Convert	C	C	Temperature [°C]
3			
4 Time Shift	0		TTL Flag 0
5 Chart Labels	1		

Formatted Data Tab

	Desktop\ChamberRun_2C_perMin.sav					Desktop\ChamberRun_2C_perMin.sav					
Component Description	MAIN.T1	MAIN.T2	MAIN.T3	MAIN.T4	MAIN.T5	Component Description	MAIN.T1	MAIN.T2	MAIN.T3	MAIN.T4	MAIN.T5
Node Number	0	0	0	0	0	Node Number	0	0	0	0	0
Non-Op Max	0	0	0	0	0	Non-Op Max	0	0	0	0	0
Op Max	0	0	0	0	0	Op Max	0	0	0	0	0
Op Min	0	0	0	0	0	Op Min	0	0	0	0	0
Non-Op Min	0	0	0	0	0	Non-Op Min	0	0	0	0	0
Max:	52.98	52.98	52.98	52.98	52.98	Max:	52.98	52.98	52.98	52.98	52.98
Min:	26.35	26.35	26.35	26.35	26.35	Min:	26.35	26.35	26.35	26.35	26.35
Average:	26.35	26.35	26.35	26.35	26.35	Average:	26.35	26.35	26.35	26.35	26.35
TTL:	0.00	0.00	0.00	0.00	0.00	TTL:	0.00	0.00	0.00	0.00	0.00
Non-Op Max Margin	-52.9778	-52.9778	-52.9778	-52.9778	-52.9778	Non-Op Max Margin	-52.9778	-52.9778	-52.9778	-52.9778	-52.9778
Op Max Margin	-52.9778	-52.9778	-52.9778	-52.9778	-52.9778	Op Max Margin	-52.9778	-52.9778	-52.9778	-52.9778	-52.9778
Op Min Margin	26.34575	26.34574	26.3457	26.34578	26.34577	Op Min Margin	26.34575	26.34574	26.3457	26.34578	26.34577
Non-Op Min Margin	26.34575	26.34574	26.3457	26.34578	26.34577	Non-Op Min Margin	26.34575	26.34574	26.3457	26.34578	26.34577

Margin

	5100 Chamber	ChamberF	ChamberF	ChamberF	ChamberRun_2C_per
Time	0.00	0.00	0.00	0.00	0.00
20	20	20	20	20	20
20	20	20	20	20	20
30	19.97781	19.9778	19.97776	19.97784	19.97783
60	19.91274	19.91271	19.91263	19.9128	19.91277
90	19.80664	19.8066	19.80648	19.80673	19.80669
120	19.66131	19.66126	19.6611	19.66143	19.66137
150	19.47844	19.47838	19.47818	19.47859	19.47852
180	19.25966	19.25958	19.25935	19.25983	19.25975

Time to Limit

	5100 Chamber	ChamberF	ChamberF	ChamberF	ChamberRun_2C_per
Time	0.00	0.00	0.00	0.00	0.00
20	20	20	20	20	20
20	20	20	20	20	20
30	19.97781	19.9778	19.97776	19.97784	19.97783
60	19.91274	19.91271	19.91263	19.9128	19.91277
90	19.80664	19.8066	19.80648	19.80673	19.80669
120	19.66131	19.66126	19.6611	19.66143	19.66137
150	19.47844	19.47838	19.47818	19.47859	19.47852
180	19.25966	19.25958	19.25935	19.25983	19.25975

Max/Min

	5100 Chamber	ChamberF	ChamberF	ChamberF	ChamberRun_2C_per
Time	0.00	0.00	0.00	0.00	0.00
20	20	20	20	20	20
20	20	20	20	20	20
30	19.97781	19.9778	19.97776	19.97784	19.97783
60	19.91274	19.91271	19.91263	19.9128	19.91277
90	19.80664	19.8066	19.80648	19.80673	19.80669
120	19.66131	19.66126	19.6611	19.66143	19.66137
150	19.47844	19.47838	19.47818	19.47859	19.47852
180	19.25966	19.25958	19.25935	19.25983	19.25975

Hover for tips/instructions

Import Sheet Tab

Data filled out by user:

Component Description	TEST1	TEST2	TEST3	TEST4	TEST5	TEST6	TEST7	TEST8	TEST9	TEST10	TEST11	TEST12
Node Number	MAIN.T1	MAIN.T2	MAIN.T3	MAIN.T4	MAIN.T5	MAIN.T6	MAIN.T7	MAIN.T8	MAIN.T9	MAIN.T10	MAIN.T11	MAIN.T12
Non-Op Max	100	100	100	100	100	100	100	100	100	100	100	100
Op Max	90	90	90	90	90	90	90	90	90	90	90	90
Op Min	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
Non-Op Min	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20

Descriptions

Limits

Imported Data, file 1

	0	69.98	69.98	69.98	69.98	69.98	69.98	69.98	69.98	69.98	69.98	69.98	0	69.98	69.98	69.98	69.98
0.08	69.72	69.59	69.59	69.73	69.71	69.72	69.78	69.78	69.81	69.74	69.35	69.95	0.08	69.67	69.56	69.52	69.52
0.17	69.57	69.34	69.43	69.53	69.48	69.62	69.62	69.61	69.69	69.59	71.01	69.94	0.17	69.41	69.15	69.14	69.14
0.25	69.58	69.24	69.6	69.44	69.36	69.79	69.53	69.5	69.93	69.74	72.21	70.03	0.25	69.22	68.81	68.86	68.86
0.33	69.83	69.36	70.09	69.45	69.41	70.32	69.54	69.47	70.77	70.34	74.32	70.31	0.33	69.12	68.53	68.68	68.68
0.42	70.39	69.77	70.74	69.52	69.62	71.25	69.62	69.54	72.31	71.36	77.65	70.83	0.42	69.08	68.29	68.58	68.58
0.5	71.11	70.06	71.12	69.64	69.96	72.1	69.73	69.66	74.02	72.36	81.51	71.44	0.5	69.03	68.05	68.45	68.45
0.58	70.89	69.7	70.66	69.42	69.79	71.86	69.56	69.5	74.05	72.25	81.91	71.55	0.58	68.94	67.75	68.22	68.22
0.67	70.5	69.21	70	69.03	69.4	71.37	69.21	69.19	73.34	71.53	81.35	71.38	0.67	68.56	67.26	67.65	67.65
0.75	70.03	68.68	69.28	68.53	68.88	70.78	68.78	68.79	72.31	70.51	80.44	71.04	0.75	68.08	66.74	66.96	66.96
0.83	69.52	68.13	68.52	67.97	68.28	70.14	68.28	68.34	71.11	69.3	79.36	70.62	0.83	67.57	66.21	66.21	66.21
0.92	69	67.55	67.71	67.38	67.64	69.48	67.76	67.86	69.84	67.97	78.14	70.15	0.92	67.03	65.64	65.4	65.4
1	68.47	66.95	66.87	66.75	66.87	68.73	67.21	67.35	69.53	66.56	76.96	69.64	1	66.47	65.03	64.56	64.56

Compare Max/Min Tab
Optional based on user selection

Component Description	TEST1	TEST2	TEST3	TEST4	TEST5	TEST6	TEST7	TEST8	TEST9	TEST10	TEST11	TEST12				
Node Number	MAIN.T1	MAIN.T2	MAIN.T3	MAIN.T4	MAIN.T5	MAIN.T6	MAIN.T7	MAIN.T8	MAIN.T9	MAIN.T10	MAIN.T11	MAIN.T12				
Non-Op Max	100	100	100	100	100	100	100	100	100	100	100	100				
Op Max	90	90	90	90	90	90	90	90	90	90	90	90				
Op Min	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10				
Non-Op Min	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20				
OVERALL MAX	72.0	72.0	72.0	72.0	72.0	72.1	72.0	72.0	74.1	72.4	81.9	72.0				
OVERALL MIN	-23.9	-31.0	-32.6	-25.7	-20.8	-22.6	-23.4	-21.2	-20.9	-24.0	-6.6	-14.7				
MAXIMUM TEMPERATURES																
D:\my_docs\MISSEX\Models\MX_MASTER_M	71.11	70.06	71.12	69.98	69.98	72.10	69.98	69.98	74.05	72.36	81.91	71.55	NA	NA	NA	NA
D:\my_docs\MISSEX\Models\MX_MASTER_M	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	75.39	70.00	NA	32.25	27.83	32.50
D:\my_docs\MISSEX\Models\MX_MASTER_M	71.00	71.00	71.00	71.00	71.00	71.00	71.00	71.00	71.00	71.00	71.00	71.00	23.42	19.67	17.00	21.25
D:\my_docs\MISSEX\Models\MX_MASTER_M	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	25.58	19.83	18.67	27.83
MINIMUM TEMPERATURES																
D:\my_docs\MISSEX\Models\MX_MASTER_M	14.79	6.84	3.95	3.46	10.12	15.46	5.37	7.91	22.40	16.70	51.95	25.68				
D:\my_docs\MISSEX\Models\MX_MASTER_M	-7.30	-15.23	-16.30	-14.14	-7.04	-6.05	-11.08	-8.81	7.03	2.66	34.57	9.95				
D:\my_docs\MISSEX\Models\MX_MASTER_M	-23.93	-31.04	-32.63	-25.71	-20.82	-22.64	-23.38	-21.18	-2.96	-6.79	18.11	0.62				
D:\my_docs\MISSEX\Models\MX_MASTER_M	-21.30	-29.41	-27.88	-17.59	-15.57	-20.79	-16.91	-17.25	-20.91	-24.04	-6.58	-14.65				

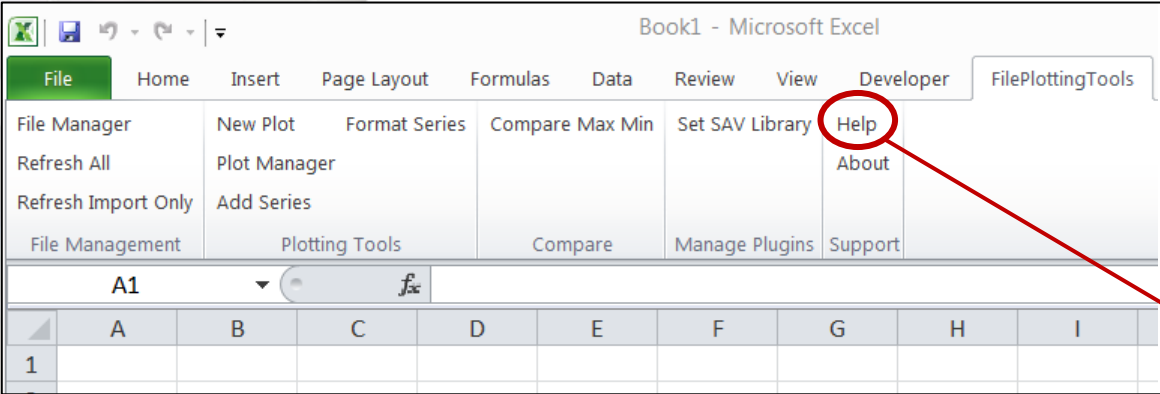
Overall Files Max/Min

TTL table for each node/File

Overall Max/Min indicator (orange border)

Highlighted cells indicate limit exceeded

User's Manual



Read Before Installing!

FilePlottingTools Manual

Version 3.1

Contents

Overview

Contact and Release Information

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Release Notes.....

Version 1.0

Version 1.1

Version 2.0

Version 2.1

Version 2.2

Version 3.0

Version 3.1

Installation Instructions

Before Using the Add-In for the First Time.....

Turn Off Compatibility Mode.....

Enable All Macros and Enable VBA Project Model

Link to the Thermal Desktop® Library.....

The Main Ribbon

File Management

File Formats

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Importing Text Files

Importing .SAV Files.....

Imported Data Format in the Excel Workbook.....

ImportSheet Tab

Formatted Data Tab.....

Refreshing Imported Data

Plotting Tools

FilePlottingTools v3.1

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Demonstration Outline

- Demo 1: Importing a .sav file, plotting, and data processing
 - SAV file import
 - Import Sheet tab inputs
 - Formatted Data tab functions
 - Creating plots
 - Modifying plots
 - Link to manual
- Demo 2: Importing a text file and file refresh options
 - Text file import
 - Differences and similarities to working with .sav files
 - Text file format
 - File refresh options
- Demo 3: Working with multiple files
 - Importing multiple files
 - Comparing files
 - Plotting with multiple files
 - Stitching files