FConst Input File Documentation

'#' in first column indicates a comment line.

General Format
    Switch: Value
    Note the : and the minimum of 1 space of whitespace after the :
    Whitespace can be blanks and/or tabs.

Switches can occur in any order in the inputs file. A switch must start in the first column, and the switch and corresponding value must appear on the same line.

Mandatory Switches:

Switch: **landscape**:
    Sets the landscape file.
Usage:
    landscape: Filename
    Where Filename is the complete path and name of the desired landscape file to use.
    Example:
    landscape: C:\data\test.lcp

Switch: **Resolution**:
    Sets calculation resolution.
Usage:
    Resolution: X
    Where X is the desired resolution of calculations. X can be an integer or floating point number.
    Example 1:
    Resolution: 270
    Example 2:
    Resolution: 270.0

Switch: **GridDistanceUnits**:
    Sets grid distance units.
Usage:
    GridDistanceUnits: X
    Where X is either 0 for meters or 1 for feet
    Example:
    GridDistanceUnits: 0

Switch: **WindSpeed**:
    Sets simulation wind speed.

Usage:

> **WindSpeed**: X
> Where X is the wind speed in MPH.
> Example:
> WindSpeed: 15

Switch: **WindDirection**:

> Sets simulation wind direction.

Usage:

> **WindDirection**: X
> Where X is the wind speed in MPH.
> Example:
> WindDirection: 270

Switch: **NumFires**:

> Sets number of fires to simulate.

Usage:

> **NumFires** X
> Where X is an integer greater than zero.
> Example:
> NumFires: 10000

Switch: **FmsFile**:

> Sets fuel moistures file.

Usage:

> **FmsFile**: Filename
> Where Filename is the complete path to custom fuel moistures file.
> Example:
> FmsFile: C:\data\sample.fms

Switch: **OutputsName**:

> Sets output burn probability grid file name.

Usage:

> **OutputsName**: Filename
> Where Filename is the base path and name of the FConst outputs files. Do not include a file extension, FConst will add the proper file extensions to this base name. If the output files exist they will be overwritten.
> Example:
> OutputsName: C:\data\outputs\constweather

Switch: **Duration**:

> Sets fires duration (minutes, -1 for unlimited)

Usage:

> **Duration**: X

Where X is an integer representing each fires burn duration in minutes. Use -1 for unlimited.
Example:
Duration: 120

Optional Switches

Switch: **customfmd**:
　　Sets custom fuels file.
Usage:
customfmd: Filename
　　Where Filename is the complete path to custom fuels definition file. Filename can
　　be -1 for no custom fuels file.
　　Example: customfmd: C:\data\sample.fmd

Switch: **ThreadsPerFire**:
　　Sets number of threads per fire.
Usage:
　　ThreadsPerFire X
　　Where X is an integer from 1 to 64. The default is 1
　　Example:
　　ThreadsPerFire: 2
Note: ThreadsPerFire is now deprecated for FConstMTT

Switch: **FireListFile**:
　　Sets path to pre-processed ignition locations file.
Usage:
　　FireListFile: Filename
　　Where Filename is the complete path to the desired FSIM generated fire size list
　　file with ignition locations. This switch should not be used if the indicated file
　　does not exist.

　　Example:
　　FireListFile: C:\data\firesizelist.txt

Switch: **CrownFireMethod**:
　　Sets Crown Fire Method
Usage:
　　CrownFireMethod: X
　　Where X is either 0 for the Finney method, or 1 for use of ScottRheinhardt
　　method. FConst will default to use of the Finney method if this switch is not
　　present.
　　Example:
　　CrownFireMethod: 1

Switch: **EnvisionFireListFile:**
Sets the Envision fire list file to use for an FConst run
Usage:
EnvisionFireListFile: Filename
Where Filename is the complete path to an Envision output fire list file. Omit this switch when not using an Envision fire list file

Example:
EnvisionFireListFile: C:\data\envisionfirelist.txt

Switch: **WxSceneFile:**
Sets the name of the weather scene file for an FConst run
Usage:
WxSceneFile: Filename
Where Filename is the complete path to the weather scene file for FConst to use. Omit this switch when not using a weather scene file
Example:
WxSceneFile: C:\data\wxscene.txt

Switch: **WxSceneSeed:**
Sets the random seed for use with the WxSceneFile
Usage:
WxSceneSeed: X
Where X is an integer value representing the initialization seed.
Switch only applicable when WxSceneFile is used. If not present a random seed is used.
Example:
WxSceneSeed: 2112

Switch: **IgnitionProbabilityGrid:**
Sets the grid of ignition probabilities for the run
Usage:
IgnitionProbabilityGrid: Filename
Where filename is the complete path to the ascii grid of ignition probabilities (0.0 – 1.0 for each cell). Coverage must encompass the entire landscape
Example:
IgnitionProbabilityGrid: C:\Data\ignitionProbs.asc

Switch: **IgnitionProbabilitySeed:**
Sets the random seed for ignition random number generator to be used with the ignition probability grid
Usage:
IgnitionProbabilitySeed: X
Where X is an integer representing the initialization seed for the ignition probability random number generator

Example:

IgnitionProbabilitySeed: 2112

Switch: **IgnitionMultiplier:**

Sets a multiplier for each ignition probability cell in the ignition probability grid

Usage:

IgnitionMultiplier: X

Where X is a floating point number to multiply ignition grid probabilities by.

Example:

IgnitionMultiplier: 0.9

Switch: **SpotProbability:**

Sets the spotting probability for fires in the run.

Usage:

SpotProbability: X

Where X is a floating point number from 0.0 to 1.0 representing the spot
probability for fires

Example:

SpotProbability: 0.2

Switch: **ProgressFilePathName:**

Sets the path to the file for progress information

Usage:

ProgressFilePathName: Filename

Where filename is the complete path to the progress file. Any existing progress
file will be overwritten.

Example:

ProgressFilePathName: C:\Data\FConstProgress.txt

Switch: **OutputFirePerims:**

Sets whether to output the fire perimeters shape file

Usage:

OutputFirePerims: X

Where X is an integer indicating whether or not to output the perimeters. 0 is off,
any other value is on.

Example:

OutputFirePerims: 1

Switch: **MetricFLP:**

Indicates that FLP output file should be a metric FLP (20 categories)

Usage:

MetricFLP: X

Where X is either 0 or 1, 1 indicates FLP should be the metrix FLP.

Switch: **MaxNumProcessors**:

Sets the maximum number of processors for FConstMTT to use. Helps when using all processors causes out of memory conditions.
Usage:
MaxNumProcessors: X
Where X is an integer representing the maximum number of processors for FConstMTT to use. Must be >= 1 and <= number of logical processors available.

Switch: **GRIDDED_WINDS_DIRECTION_FILE:**
Sets the pre-generated ascii grid file to use for direction gridded winds. Coverage must completely cover the landscape, values are azimuth (0 – 359)
Usage:
GRIDDED_WINDS_DIRECTION_FILE: Filename
Where Filename is the complete path to the gridded winds direction ascii grid file.
Example:
GRIDDED_WINDS_DIRECTION_FILE: C:\Data\Wind_Dir_180_5mph.asc

Switch: **GRIDDED_WIND_SPEED_FILE:**
Sets the pre-generated ascii grid file to use for direction gridded winds. Coverage must completely cover the landscape, values are in mile per hour (mph)
Usage:
GRIDDED_WIND_SPEED_FILE: Filename
Where Filename is the complete path to the gridded winds speed ascii grid file.
Example:
GRIDDED_WIND_SPEED_FILE: C:\Data\Wind_Speed_180_5mph.asc

Switch: **FLPinFirelist:**
Add Flame Length proportions for each fire to the output fire list. Uses Metric FLP classes (0.5 m increments)
Usage:
FLPinFirelist: X
Where X is an integer value, 0 is off any other value is on.
Default is 0.
Does not apply when EnvisionFireListFile is used, that switch automatically turns on FLP metric classes in the output firelist.

Switch: **NetworkGridResolution:**
Sets for creation of network grid and network flow output.
Usage:
NetworkGridResolution: X
Where X is the resolution of the created network grid. NetworkGridResolution must be greater than or equal to the resolution of calculations.

Switch**: WxSceneGrid:**
Use a WxScene grid configuration file to run with gridded wxScenes.

Usage: **WxSceneGrid:** Filename
      Where filename is the complete path to the WxScene grid configuration file.

The format of the WxScene grid configuration file is:
1) One line denoted with the keyword GRID_FILE: which contains the path to the ascii grid file containing indices of wxScenes to use for each cell.
2) Entries for each scene to be found in the GRID_FILE. Each unique value in the grid file needs an entry here. The format of each entry is
   a.) Index Windspeed Direction Duration Probability FM1 FM10 FM100 FMHerb FMWood SpotProbability
      i.) Index is the index to match the scene in the GRID_FILE (integer)
      ii.) Windspeed is the scene's wind speed in MPH (integer)
      iii.) Direction is the scene's wind direction azimuth (integer)
      iv.) Duration is the scene's burn duration in minutes (integer)
      v.) Probability is the scene probability (will be normalized by index)
      vi.) FM1 is the scene's 1 hour fuel moisture (integer)
      vii.) FM10 is the scene's 10 hour fuel moisture (integer)
      viii.) FM100 is the scene's 100 hour fuel moisture (integer)
      ix.) FMHerb is the scene's live herbaceous fuel moisture (integer)
      x.) FMWood is the scene's live woody fuel moisture (integer)
3) Comments, any line starting with a #

There can be multiple entries per Index, with each Index's corresponding probability considered relative for the index. All probabilities will be normalized for each Index so the total probability for each Index is 1.0

The WxSceneSeed value, if present, will be used to initialize the random number generator for scene selection.

Sample WxSceneGrid file:
GRID_FILE: F:\Alan\GridWxScene\fuel.asc
Each cell in grid contains an Index to the following table
#Index Speed Direction Duration Probability FM1 FM10 FM100 FMHerb FMWoody SpotProbability
1 13 127 240 0.09 4 6 9 49 79 0.05
1 23 227 340 0.09 4 6 9 49 79 0.05
1 33 77 340 0.09 2 4 6 49 79 0.05
1 3 227 240 0.09 4 6 9 49 79 0.05
1 10 327 140 0.09 4 6 9 49 79 0.05
2 13 167 240 0.11 2 4 6 49 79 0.05
2 18 227 240 0.11 4 6 9 49 79 0.05

Switch: **EmberOutputs:**

Output Embers generated in an FConstMTT run. Embers are output if they survive the spot probability draw, regardless of whether or not they start a new fire.

Usage:

EmberOutputs: X

Where X is an integer from one of the following values:

0 = No ember outputs (default)

1 = Ember outputs in CSV format

2 = Ember output in shape file format

3 = Ember output in both CSV and shape file format

Switch: **MajorPathVecs:**

If set to 1 FConstMTT will create an output csv file with major path information for the five longest major paths for each fire. Information include vector points and arrival time.

Usage:

MajorPathVecs: X

Where X is an integer value, 1 turns MajorPathVecs calculation on, zero (default) disables MajorPathVec generation.

Switch: **FlameLengthTranslatorFile**: (Optional)

Purpose: Designate the file to invoke the FlameLengthTranslator functionality of FConstMTT

Usage:

FlameLengthTranslatorFile: X
Where X is the complete path to the Flame Length Translator Input File. Please see documentation in FlameLengthTranslatorInputFile.pdf for a complete explanation of use of the Flame Length Translator functionality.

Switch: **EnvisionFireIDField**: (Optional)

Purpose: Designate a unique FireID field which occurs in the **EnvisionFireListFile** and will be carried for the fire and reported in the output fire list file as well as flame length grid names and as an attribute in the perimeter shapefile.

Usage:

EnvisionFireIDField: X
Where X is the exact name of the field in the EnvisionFireListFile to be used as a unique ID.

Switch: **OutputFlameLengthGrids**: (Optional, default is 0)

Purpose: Indicate whether or not FConstMTT should output flame length GeoTIFF grids for each individual fire.
If non-zero, FConstMTT will create a folder named [**OutputsName**]_FlameLengths and place GeoTIFF files of each fire in this folder. If **EnvisionFireIDField** is used, fires will be named with [EnvisionFireIDField]_[EvnisionFireIDFieldValue].tif. Otherwise files will be named Fire_[FConst_ID].tif, where FConst_ID is the same as reported in the output fire list file.
Flame Length values in the GeoTIFF are output in meters.

Usage:

OutputFlameLengthGrids: X
Where X is an integer boolean vale, 1 to output flame length grids, 0 to disable output of flame length grids.

Calibration mode switches:

Switch: **CalibrationMode**: (Optional default is 0)
        Purpose: Used to cause FConstMTT to enter calibration mode when using an
        EnvisionFireListFile. Calibration mode is defined as:
        When the simulated fire size is smaller than the predicted fire size (Original_Size
        in the **EnvisionFireListFile**) by a factor of X (indicated by the
        CalibrationFactor switch), the fire will be simulated up to **CalibrationRetries**
        times using random ignitions within a radius (**CalibrationRadius**) of the original
        ignition point. The X and Y coordinates of the first simulated fire that meets the
        fire **CalibrationFactor** restrictions, or comes closest if **CalibrationRetries** are
        all simulated, will replace the original location of the fire in the output fire list
        file, and the selected fire's results will be used for all outputs.
Usage:
        CalibrationMode: X
        Where X is a boolean integer value, use 1 to enter CalibrationMode, 0 to disable.
        NOTE: If **CalibrationMode**: is used, the following switches are also required:
        CalibrationFactor:, **CalibrationRadius**:, and **CalibrationRetries**:

Switch: **CalibrationFactor**: (Optional, required for **CalibrationMode**)
        Purpose: To set the desired minimum size of each fire. The desired size is
        calculated by multiplying the Original_Size value read from the
        EnvisionFireListFile by the **CalibrationFactor**. Original_Size is assumed to be
        in Hectares.
Usage:
        CalibrationFactor: X
        Where X is a real number value to multiply with the Hectares field value for each
        fire to determine minimum desired fire size.

Switch: **CalibrationRadius**: (Optional, required for **CalibrationMode**)
        Purpose: Sets the radius (in meters) for generating new ignition points. New
        ignition points will be within CalibrationRadius meters of the original fire
        location.
Usage:
        CalibrationRadius: X
        Where X is a real number to indicate the CalibrationRadius

Switch: **CalibrationRetries**: (Optional, required for **CalibrationMode**)
        Purpose: To indicate the maximum number of times to generate a new ignition
        point for each fire.
Usage:
        CalibrationRetries: X
        Where X is a positive integer value indicating the maximum number of times to
        reburn a fire.

Switch: **CalibrationIgnitionTries** (Optional, default = 100)

        Purpose: To set the number of times FConstMTT will try to find an burnable ignition point within **CalibrationRadius** of the original ignition point in the **EnvisionFireListFile** for each calibration fire try. This can be particularly useful when the original ignition location is located in or near large areas of non-burnable fuels, by increasing the number of ignition retries.

Usage:

        CalibrationIgnitionTries: X

        Where X is an integer representing the maximum number of times FConstMTT will try to find a new ignition point for each calibration fire. If FConstMTT fails to find an ignition within **CalibrationRetries** times a warning is output, the fire retry is discarded, and FConstMTT moves on to the next retry.

Sample FConst Inputs File

#set the lcp file
landscape: C:\data\sample.lcp
#set calculation resolution
Resolution: 270
#set number of fires to simulate
NumFires: 10000
#set grid distance units
GridDistanceUnits: 0
#set the FMS file
FmsFile: C:\data\sample.fms
#set the wind speed to 15 mph
WindSpeed: 15
#set wind direction to 270
WindDirection: 270
#set fire duration
Duration: 120
#set outputs base name
OutputsName: C:\data\outputs\run1