
Command Reference: WriteTimeSeriesToExcelBlock()

Write 1+ time series to a Microsoft Excel workbook file using block layout

Version 11.07.03, 2015-09-06

This command is under development.

The `WriteTimeSeriesToExcelBlock()` command writes one or more time series to an Excel workbook with output being in block layout. The following functionality is provided:

- Time series are written in blocks (see `WriteTimeSeriesToExcel()` for simple column output).
- The worksheet and position in worksheet can be specified.
- The output can be created or appended.
- Options are provided to select how the blocks of data are oriented. For example, for monthly time series rows may contain years of data and columns may contain months of data.

TSTool uses the Apache POI software (<http://poi.apache.org>) to read/write the Excel file and consequently functionality is constrained by the features of that software package.

The following figures illustrate the dialog used to edit the command and the syntax for the command.

Edit WriteTimeSeriesToExcelBlock() Command

This command is under development. Currently only daily and monthly time series can be processed and parameter support is limited until features are enabled.
This command writes a list of time series to a worksheet in a Microsoft Excel workbook file (*.xls, *.xlsx), in blocks of rows and columns.
See the WriteTimeSeriesToExcel() command to output multiple time series as columns of data.

Time Series to Write | **Excel Output** | Layout | Statistics | Data Flags | Style Formatting

Specify the time series to output. Each time series will be positioned in the worksheet as per the "Excel Output" and "Layout" tabs.
Currently only the first time series is processed.

TS list: Optional - indicates the time series to process (default=AllTS).

TSID (for TSList=AllMatchingTSID):

EnsembleID (for TSList=EnsembleID):

Missing value: Optional - value to write for missing data (default=initial missing value).

Output precision: Optional - precision for data values (default=based on units).

Output start: Optional - override the global output start (default=write all data).

Output end: Optional - override the global output end (default=write all data).

Command:
`WriteTimeSeriesToExcelBlock(MissingValue=Blank,OutputFile="Results/Test_WriteTimeSeriesToExcelBlock_Day_out.xlsx",Worksheet="DayInterval",ExcelAddress="A1",LayoutBlock=Period,LayoutColumns=DAY,LayoutRows=YearDescending,OutputYearType=Water,ConditionTableID="ConditionTable",StyleTableID="StyleTable")`

WriteTimeSeriesToExcelBlock_TimeSeries

WriteTimeSeriesToExcelBlock() Command Editor for Time Series Parameters

Time Series to Write | Excel Output | Layout | Statistics | Data Flags | Style Formatting

Currently a single time series can be output. In the future features will be enabled to match each time series with a worksheet or subset.
 Each time series will be output in a block of cells with the upper left indicated by the address information.
 The worksheet will be created if it does not exist. Time series properties can be used to specify the worksheet name using syntax \${Property}.
 It is recommended that the location of the Excel file be specified using a path relative to the working directory.
 The working directory is: C:\owf-gitrepos\cdss-app-tstool-test\test\regression\commands\general\WriteTimeSeriesToExcelBlock

Output (workbook) file:

Append?: Optional - whether to append to Excel file (default=False or True if open).

Worksheet: Optional - worksheet name (default=first sheet).

Specify the address for a contiguous block of cells the in Excel worksheet -

by Excel Address

Excel address: Excel cell block address in format A1 or A1:B2.

Keep file open?: Optional - keep Excel file open? (default=False).

WriteTimeSeriesToExcelBlock_ExcelOutput

WriteTimeSeriesToExcel() Command Editor for Excel Output Parameters

Time Series to Write | Excel Output | Layout | Statistics | Data Flags | Style Formatting

Each time series is formatted by specifying a layout block (chunk of data) and then the layout within that block of data by columns and rows.
 See the "Style Formatting" tab for features to format cells based on time series data values and flags
February 29 of non-leap years in daily and smaller interval time series is set to blank (more options will be added later).

Layout block: Required - output block content.

Layout columns: Required - time slice of each column.

Layout rows: Required - time slice of each row.

Output year type: Optional - output year type (default=Calendar).

Column labels: Optional - format for column labels.

Row labels: Optional - format for row labels.

WriteTimeSeriesToExcelFormatted_Layout

WriteTimeSeriesToExcel() Command Editor for Layout Parameters

Time Series to Write | Excel Output | Layout | Statistics | Data Flags | Style Formatting

Statistics features are currently not enabled.
 The block of data can optionally also have statistics on the right-most columns or bottom-most rows.

Column statistics: Optional - built-in statistics to include at bottom of each column.

Column statistic formulas: Optional - statistic formulas to include at bottom of each column.

Row statistics: Optional - built-in statistics to include to right of each row.

Row statistic formulas: Optional - statistic formulas to include to right of each row.

WriteTimeSeriesToExcelBlock_Statistics

WriteTimeSeriesToExcel() Command Editor for Statistics Parameters

Time Series to Write | Excel Output | Layout | Statistics | **Cell Comments** | Style Formatting

Cell comment formatting based on time series values, data flags, and properties currently is not enabled.
In the future features may be enabled similar to the WriteTimeSeriesToExcel() command.
Use the "Cell Style Formatting" tab to format cells based on a condition evaluation.

Data flag cell comment:

Optional - cell comment for data flag.

WriteTimeSeriesToExcelBlock_DataFlags

WriteTimeSeriesToExcel() Command Editor for Data Flag Parameters

Time Series to Write | Excel Output | Layout | Statistics | **Style Formatting** | Cell Comments

The following parameters control how Excel cells are formatted, using a general style formatting approach.
Style-based formatting requires as input a condition table to indicate how to evaluate cell contents for style formatting.
A style table indicates the style properties to format a cell, such as the fill foreground color.
Refer to the command documentation for details.
The position for the legend can be specified using A1 address, named range, or R[{\$(Property)+N}]C[{\$(Property)+N}], where N is an offset of the property value.

Condition table ID: Required when using styles - conditions to determine styles.

Style table ID: Required when using styles - style definitions.

Legend worksheet: Optional - worksheet for legend (default=same as for time series).

Legend address: Optional - upper-left address for legend (default=no legend).

WriteTimeSeriesToExcelBlock_Style

WriteTimeSeriesToExcel() Command Editor for Style Formatting Parameters

The command syntax is as follows:

```
WriteTimeSeriesToExcelBlock (Parameter=Value,...)
```

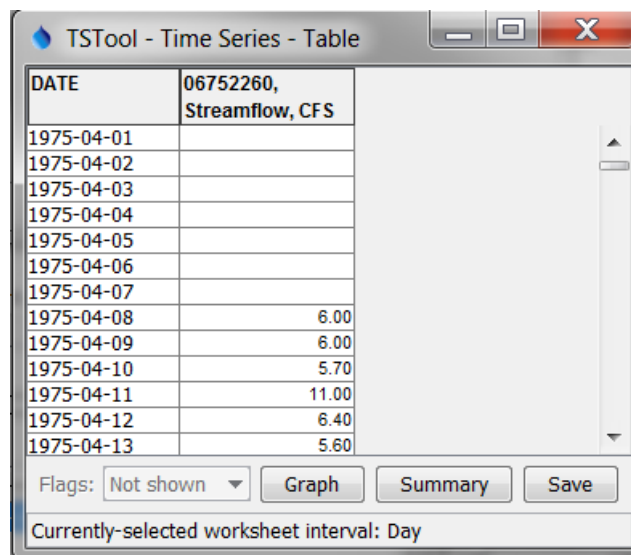
Command Parameters

Parameter	Description	Default
TSList	Indicates the list of time series to be processed, one of: <ul style="list-style-type: none"> AllMatchingTSID – all time series that match the TSID (single TSID or TSID with wildcards) will be processed. AllTS – all time series before the command. EnsembleID – all time series in the ensemble will be processed. FirstMatchingTSID – the first time series that matches the TSID (single TSID or TSID with wildcards) will be processed. LastMatchingTSID – the last time series that matches the TSID (single TSID or TSID with wildcards) will be processed. SelectedTS – the time series are those selected with the SelectTimeSeries() command. 	AllTS
TSID	The time series identifier or alias for the time series to be processed, using the * wildcard character to match multiple time series. Can be specified with processor \${Property}.	Required if TSList=*TSID.

Parameter	Description	Default
EnsembleID	The ensemble to be processed, if processing an ensemble. Can be specified with processor <code>\${Property}</code> .	Required if <code>TSList=EnsembleID</code> .
MissingValue	Value to write to Excel for missing data values, can be literal <code>Blank</code> to output blank cell.	Original missing value.
Precision	The number of digits after the decimal for data values.	Determine from units.
OutputStart	The date/time for the start of the output. Can be specified with processor <code>\${Property}</code> .	Use the global output period.
OutputEnd	The date/time for the end of the output. Can be specified with processor <code>\${Property}</code> .	Use the global output period.
OutputFile	The name of the Excel workbook file (*.xls or *.xlsx) to write, as an absolute path or relative to the command file location. If the Excel file does not exist it will be created. Can be specified with processor <code>\${Property}</code> .	None – must be specified.
Append	Indicate whether the sheet being written should appended to an existing workbook.	False – create a new workbook.
Worksheet	The name of the worksheet in the workbook to write. If the worksheet does not exist it will be created. Can be specified with processor <code>\${Property}</code> .	Write to the first worksheet.
ExcelAddress	Indicates the block of cells to write, using Excel address notation (e.g., A1:D10).	Must specify address using one of available address parameters.
ExcelNamedRange	Indicates the block of cells to write, using an Excel named range.	Must specify address using one of available address parameters.
ExcelTableName	Indicates the block of cells to write, using an Excel named range.	Must specify address using one of available address parameters.
KeepOpen	Indicate whether to keep the Excel file open (True) or close after creating (False). Keeping the file open will increase performance because later commands will not need to reread the workbook. Make sure to close the file in the last Excel command.	False
LayoutBlock	Indicate data blocks for output: <ul style="list-style-type: none"> Period – time series period of record is output as a block Year – year of data is output in a block 	None – must be specified.
LayoutColumns	For the output block, indicate what columns contain: <ul style="list-style-type: none"> Day – one day per column Month – one month per column Year – one year per column 	None – must be specified.
LayoutRows	For the output block, indicate what rows contain: <ul style="list-style-type: none"> YearAscending – year, with earliest at top 	None – must be specified.

Parameter	Description	Default
	<ul style="list-style-type: none"> YearDescending – year, with most recent at top 	
Output YearType	The output year type, which controls the start and end dates for the output.	Calendar
Condition TableID	Identifier for condition table (see below). Can be specified using processor \${Property}.	Style formatting is not used.
StyleTableID	Identifier for style table (see below). Can be specified using processor \${Property}.	Style formatting is not used.
Legend Worksheet	Name of worksheet where the legend should be created. The legend displays conditions and styles.	Time series worksheet.
LegendAddress	Address A1, etc. for upper-left of legend.	No legend created.

Excel cell formatting consists of number formatting, cell colors, cell width, etc. The **Style Formatting** tab provides general formatting capabilities for data cells. Consider the following time series data table, where the goal is to write the TSTool time series to Excel and format cells to indicate specific conditions of interest. This approach is implemented similarly in the `WriteTableToExcel()` command.



DATE	06752260, Streamflow, CFS
1975-04-01	
1975-04-02	
1975-04-03	
1975-04-04	
1975-04-05	
1975-04-06	
1975-04-07	
1975-04-08	6.00
1975-04-09	6.00
1975-04-10	5.70
1975-04-11	11.00
1975-04-12	6.40
1975-04-13	5.60

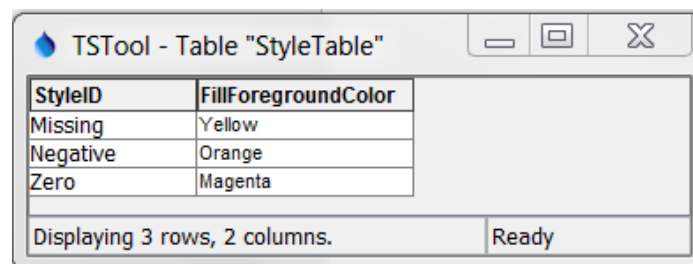
Flags: Not shown Graph Summary Save

Currently-selected worksheet interval: Day

WriteTimeSeriesToExcelBlock_DataTable

Data Table used with WriteTimeSeriesToExcelBlock() Command Style Formatting

To configure style-based formatting, a style table is defined listing properties for formatting cells. This table can be defined as a CSV file, Excel worksheet or other format and read into TSTool using a suitable command. The following figure illustrates a basic style table, which can be shared among commands.



StyleID	FillForegroundColor
Missing	Yellow
Negative	Orange
Zero	Magenta

Displaying 3 rows, 2 columns. Ready

WriteTableToExcel_StyleTable

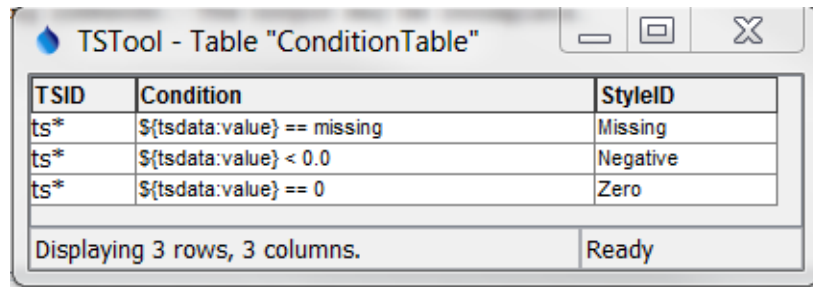
Style Table used with WriteTimeSeriesToExcelBlock() Command for Specific Checks and Formatting

The following style table column names are recognized. The default values for cell style properties not listed in the table are those provided by Excel.

Recognized Style Table Column Names

Column Name	Description	Default
StyleID	An identifier for the style, which is used in the format table below.	None – must be specified.
FillForegroundColor	The foreground fill color as a named color (e.g., “Red”), RGB triplet (255,255,255), or hex color 0xFFFFFF. The following named colors are recognized: black, blue, cyan, darkgray, gray, green, lightgray, magenta, none, orange, pink, red, white, yellow.	No fill color.
FillPattern	Fill pattern for cells using FillForegroundColor and FillBackgroundColor.	Currently always defaults to solid.

The condition table indicates how the styles are used for time series data. The following example indicates that any time series with identifier (or alias) starting with “ts” should be processed to evaluate for missing, negative, and zero values.



TSID	Condition	StyleID
ts*	\${tsdata:value} == missing	Missing
ts*	\${tsdata:value} < 0.0	Negative
ts*	\${tsdata:value} == 0	Zero

Displaying 3 rows, 3 columns. Ready

WriteTimeSeriesToExcel_ConditionTable

Condition Table used with WriteTimeSeriesToExcelBlock() Command for Specific Checks and Formatting

The column names for the condition table must be specified as shown. The **Condition** column recognizes the following time series data specifiers:

- `${tsdata:value}` – the time series data value, used to evaluate numerical conditions
- `${tsdata:flag}` – the time series flag, used to evaluate string conditions

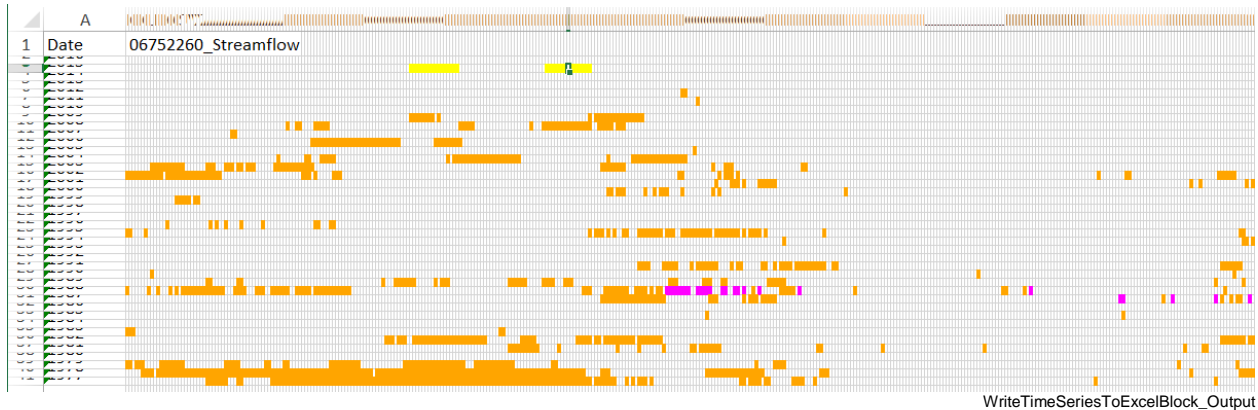
Values on the left and right of the operator must be separated with spaces to facilitate parsing the condition. The **Condition** column recognizes the following operators:

Condition Table Operators

Operator	Description
<	Less than.
<=	Less than or equal to.
==	Equal to. Specify the right-side value as <code>missing</code> to check for missing.

Operator	Description
!=	Not equal to. Specify the right-side value as <code>missing</code> to check for missing.
>	Greater than.
>=	Greater than or equal to.
contains	Specify for string values to check for substring (case-independent).

Multiple conditions can be specified by using AND (surrounded by a single space) between conditions. The **Display** column in the condition table is optional and provides test to use in the legend. If the **Display** column is not provided, the **Condition** column contents will be used for the legend.



WriteTimeSeriesToExcelBlock() Command Example Output for Specific Checks and Formatting

The following example illustrates using multiple conditions to implement a color scale.

StyleID	FillForegroundColor
Color1	Red
Color2	Orange
Color3	Yellow
Color4	Green
Color5	Cyan
Color6	Blue

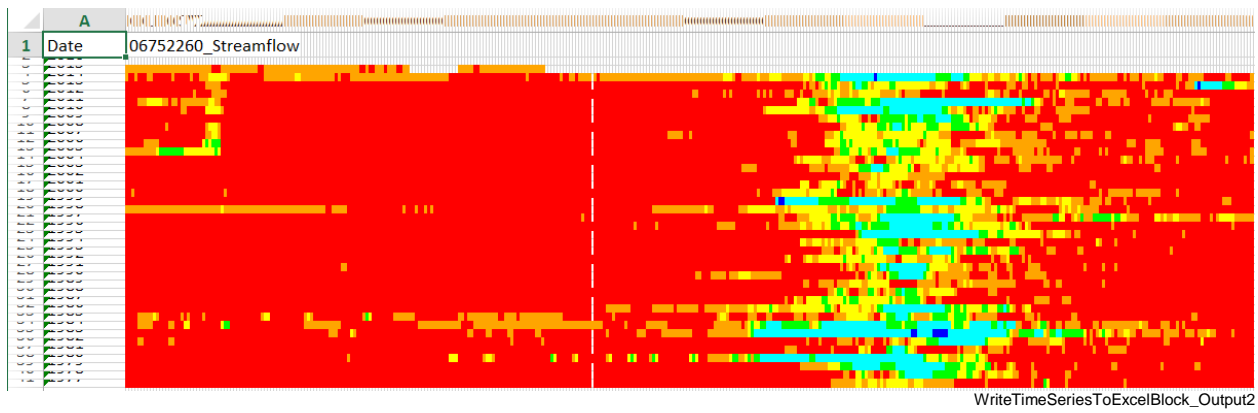
WriteTimeSeriesToExcel_StyleTable2

Style Table used with WriteTimeSeriesToExcelBlock() Command for a Color Scale

TSID	Condition	Display	StyleID
*	$\$(tsdata: value) < 100$	Value < 100	Color1
*	$\$(tsdata: value) \geq 100.0 \text{ AND } \$(tsdata: value) < 250$	100 >= Value < 250	Color2
*	$\$(tsdata: value) \geq 250.0 \text{ AND } \$(tsdata: value) < 500$	250 >= Value < 500	Color3
*	$\$(tsdata: value) \geq 500.0 \text{ AND } \$(tsdata: value) < 1000$	500 >= Value < 1000	Color4
*	$\$(tsdata: value) \geq 1000.0 \text{ AND } \$(tsdata: value) < 5000$	1000 >= Value < 5000	Color5
*	$\$(tsdata: value) \geq 5000.0$	Value >= 5000	Color6

WriteTimeSeriesToExcelBlock_ConditionTable2

Condition Table used with WriteTimeSeriesToExcelBlock() Command for a Color Scale



WriteTimeSeriesToExcelBlock() Command Example Output for Style Formatting