TYPE 518: MONTHLY SCHEDULER

General Description

The Monthly Values utility programs (Type518.exe and MonthSched.exe) are used in conjunction with TRNSYS Type 518 to input schedules that change on a monthly basis.

Two applications are provided: Type518.exe is a plugin for use with the TRNSYS Simulation Studio while MonthSched.exe is designed for use in distributable TRNSED applications. The first section of the Detailed Description here below provides the user with information on manipulating Type518.exe and MonthSched.exe since operationally they are identical. Type518.exe and MonthSched.exe differ only in the format of data that they pass to the program that called them. A second section describes the use of Type518 and Type518.exe within the TRNSYS Simulation Studio environment. The third section of the Detailed Description describes the application of MonthSched.exe in TRNSED distributable applications.

Detailed Description

1. Use of the Monthly Scheduler Programs

In the text box at the top of the screen, is displayed the name of the file which will store the values and be read in by TRNSYS as can be seen in Figure 1. The file name can be typed directly into the text box or it can be selected by pushing the "Browse" button to the right of the text box. Note that the complete path name must be entered correctly for TRNSYS to find the file.



Figure 1: Location and Name of Monthly Schedule Data File

The next three input boxes are used to set the sliders for input as shown in Figure 2. The first two set the minimum and maximum values for the allowable input range and the third sets the number of intervals between the max and min. For example, if the minimum is 20, the maximum is 30, and the number of intervals is 10, then the user is able to specify any integer between 20 and 30.



Figure 2: Monthly Slider Value Parameters

The sliders and input boxes for the twelve months are displayed next, as shown in Figure 3. The schedule values may be entered in two different methods: by moving the sliders or by entering the values directly into the input boxes. The two methods are equivalent and will enter the same values into the schedule file.

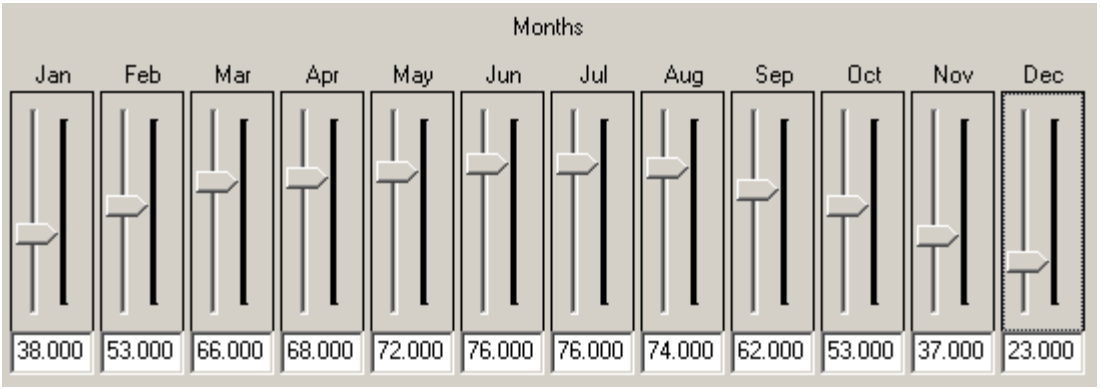


Figure 3: Monthly Sliders

The drop down box at the bottom of the screen (Figure 4) is used to designate to TRNSYS whether the entered data should be considered as constant for the entire month at the supplied values or should be interpolated between the months such that the entered value is the average value over the month.

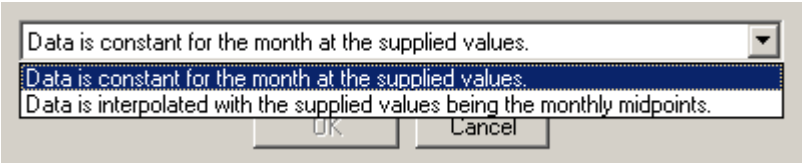


Figure 4: Interpolation Scheme for Monthly Values

Finally the user has two methods of leaving the Monthly Values program. By selecting the "OK" button the entered data is saved to the designated output file. By selecting the "Cancel" button the values are not written to the file.

Advanced Uses:

The display of the MonthSched or Type518 program can be controlled based on the information passed to the program (i.e. the command line). The file name, the minimum value, the maximum value, and the number of intervals may all be passed to the program with the use of the appropriate keyword. For the file name the keyword is "file=", for the minimum value it is "min=", for the maximum value it is "max=" and for the number of intervals it is "inter=". If multiple keywords are to be used, they should be comma delimited without any spaces. In addition to setting the values, passing the range and interval numbers also signal the program that these values are no longer user inputs. If a value is specified then the input box will not be displayed on the screen when the program is running. Specifying the file name will cause all of the values to be read in from the file (if it is an existing file), but will not change the appearance of the display. The user will still be able to specify the output file name and the range values. If the file is specified along with any of the range values, the values out of the file will be the values used, but the program will be signaled to not display that particular input. In this manner the range input boxes can be controlled even when the values are read out of a file.

2. Implementation of Type518.exe and the Type518 Component in the Simulation Studio

Type518.exe is a Simulation Studio plugin. Plugins offer an alternative method for entering parameters and inputs. Once Type518 has been placed in a Studio project, double click the component as you

normally would to enter its parameter and input initial values. The window that pops up should look like that shown in Figure 5. Clicking the icon in the lower left hand corer of the window will launch Type518.exe, allowing you to set the appropriate schedule.

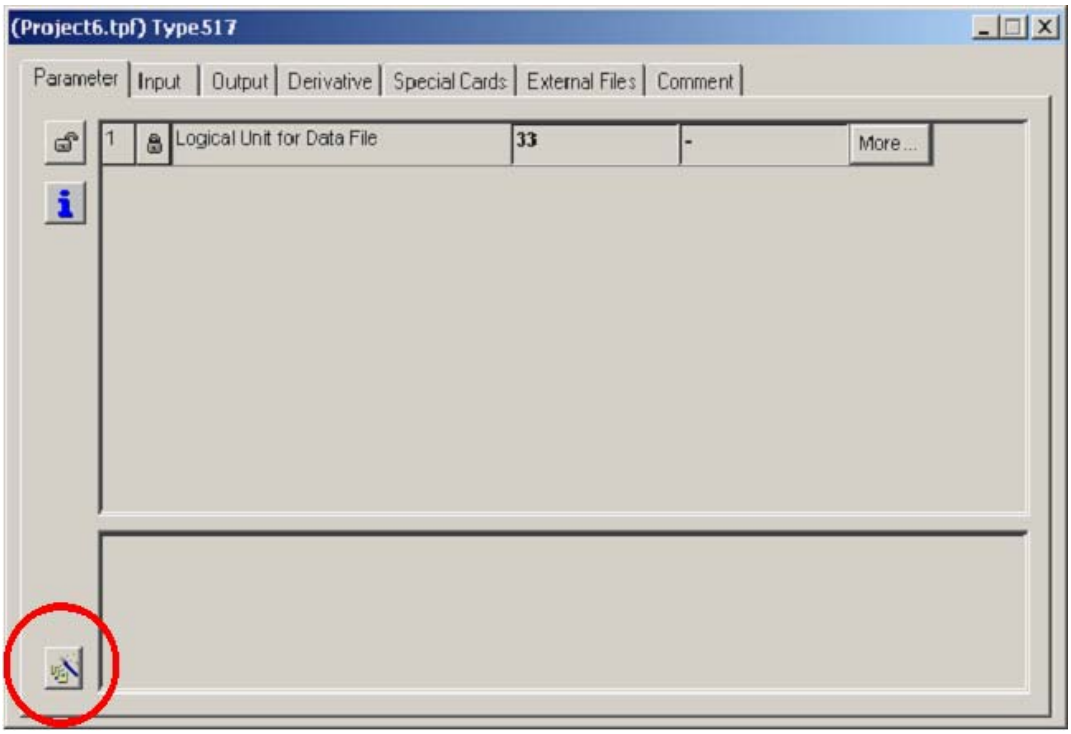


Figure 5: Data Entry when a Plugin is Available

3. Implementation of MonthSched and the Type518 Component in TRNSED

While TRNSED is a powerful tool for taking user supplied data and inserting it into the appropriate spot in a TRNSYS simulation input file, for some types of data, TRNSED's built in syntax can be cumbersome for the user. For example, if the TRNSED programmer wishes to allow the end user to enter monthly average values of ground reflectance, s/he is limited to either putting predefined values of ground reflectance into a pull down menu or into a group controlled by a radio button, or to adding 12 sequential numerical value fields into the TRNSED interface, one for each ground reflectance value. Type518 and its companion program (monthsched.exe) offer an alternative; the TRNSED programmer can provide the end user with a clickable button in the TRNSED interface. When the end user clicks that button the monthsched application is launched and the end user can set up the schedule of ground reflectances using sliders. The following example shows a possible implementation in TRNSED. Please refer to the TRNSED/TRNEdit manual for more information regarding the syntax used.

Figure 6 shows what the TRNSED end user might see in this example's implementation of Type518. The text and button in the figure below are contained in a bitmap image called GrndRefB.bmp

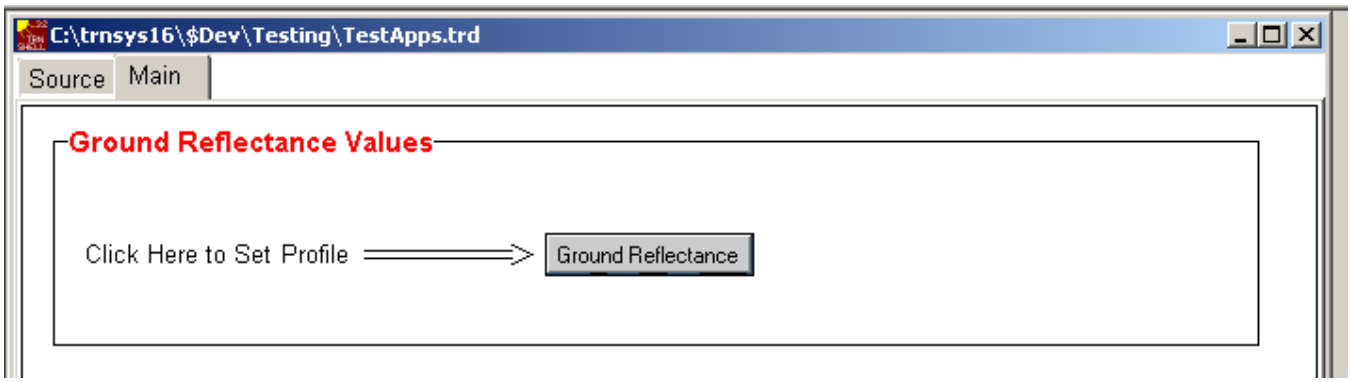


Figure 6: A Clickable Button in TRNSED. Clicking the button launches the MonthSched.exe Application

The TRNSED source required to create Figure 6 is as follows:

```
*|[GroundReflectanceDisplay|Ground Reflectance Values
*|<APPLINK3> \trnsys16\images\GrndRfB.bmp file=\trnsys16\AppsDat\T518dat.slm,min=0,max=1,inter=10   LEFT
ASSIGN "c:\trnsys16\AppsDat\T518dat.slm"  24
*|]

...

UNIT 25 TYPE 518 - MONTHLY FORCING FUNCTION SCHEDULER (MONTHSCHED.EXE)
PARAMETERS 1
24         !logical unit of data file
```

In the above, the <APPLINK3> keyword takes three arguments. The first argument is the location of the clickable bitmap image that will be displayed in TRNSED view. When clicked, the executable program associated with APPLINK3 (in this case MonthSched.exe) will be launched with the second argument. The second argument is the file that should be loaded by the launched program. In this case, it is the *.slm file that contains the monthly schedule data. The third argument is a justification (LEFT, RIGHT, or CENTER) for the bitmap image.

The only other thing that the TRNSED programmer must do in order to implement the clickable button is to make sure that APPLINK3 in the TRNEdit File: Setup Menu is directed to MonthSched.exe. The Link Tab might be set as follows:

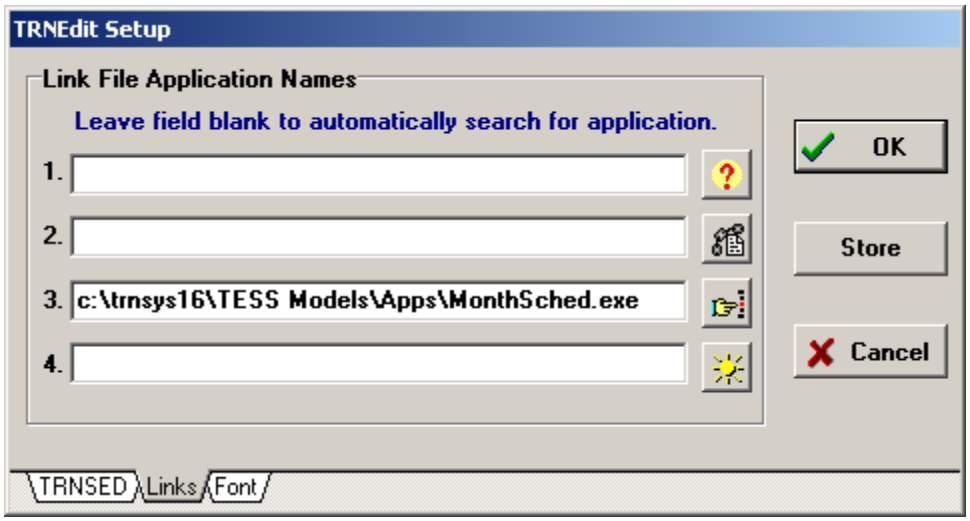


Figure 7: The TRNEdit Links Setup

When the end user clicks on the button labeled “GroundReflectance,” c:\trnsys16\Tess Models\Apps\MonthSched.exe is launched with the file c:\trnsys16\AppsDat\T518dat.slm.” Once the user has made and saved their changes to the slider values, MonthSched records those changes in the .slm file. Later in the TRNSED input file, the same file is ASSIGNed to a logical unit number. This data file is read by Type518 during the simulation and the Type outputs appropriate values of the ground reflectance for each hour of the simulation.