TYPE 516: MULTIPLE DAY SCHEDULER

General Description

The Multiple Schedules utility programs (Type516.exe and MultSched.exe) and TRNSYS Type516 are used in conjunction with one another to input schedules with a Weekday, Saturday, and Sunday basis. It should be noted that while temperature notation is used throughout this documentation, there is no inherent reason why Type516 cannot be used to schedule any type of data desired by the user. Type516 differs from Type517 only in that it allows for different schedules to be set for weekdays, Saturdays and Sundays. Type517 applies the same schedule regardless of the day of the week.

Two applications are provided: Type516.exe is a plugin for use with the TRNSYS Simulation Studio while MultSched.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 Type516.exe and MultSched.exe since operationally they are identical. Type516.exe and MultSched.exe differ only in the format of data that they pass to the program that called them. A second section describes the use of Type516 and Type516.exe within the TRNSYS Simulation Studio environment. The third section of the Detailed Description describes the application of MultSched.exe in TRNSED distributable applications.

Detailed Description

1. Use of the 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 shown 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: Data File Name and Location

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.

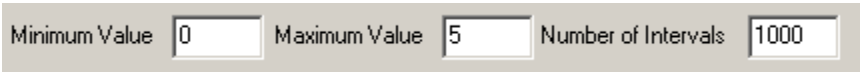


Figure 2: Monthly Slider Value Parameters

The schedule values are entered with the sliders and input boxes in the middle of the screen as shown in Figure 3. Selecting the appropriate tab determines if the values are being input for the Weekday, Saturday, or Sunday schedule. 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. The 12 hours before noon are input with the top set of sliders and the 12 hours after noon are input with the bottom set.

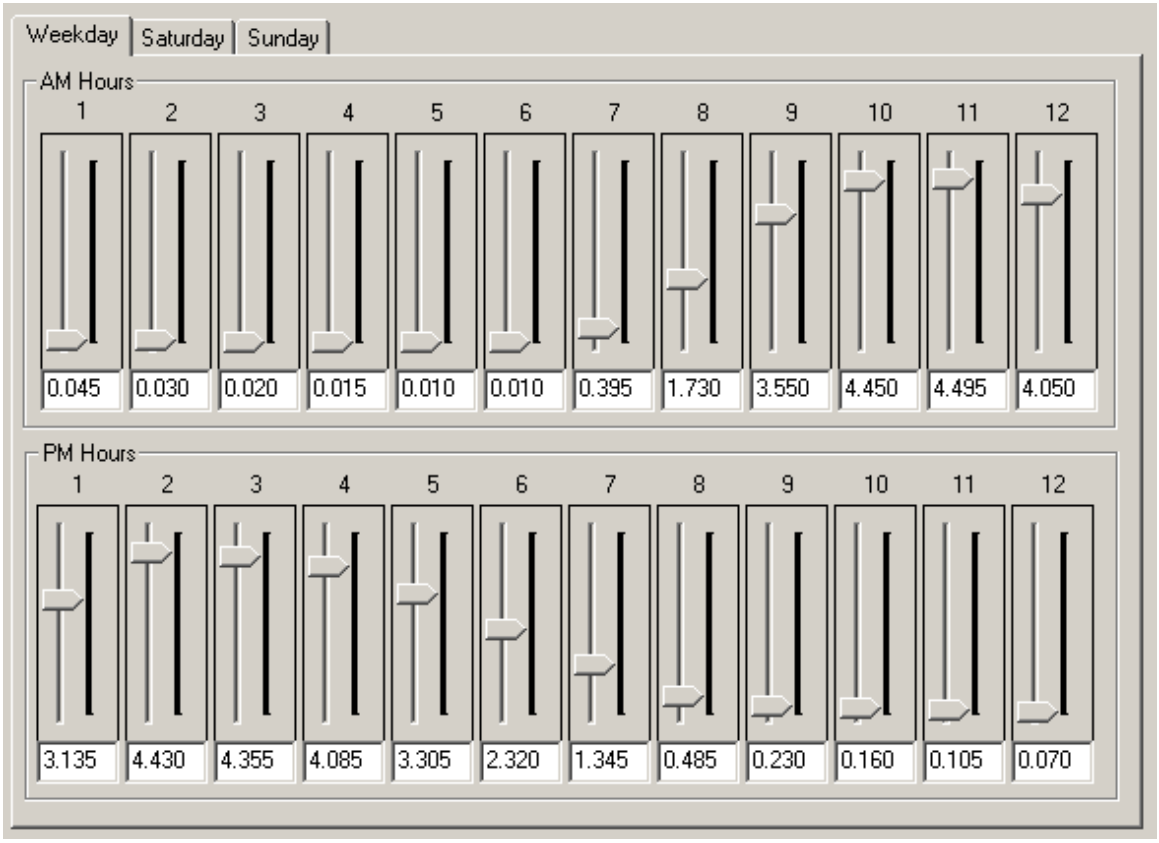


Figure 3: Hourly Sliders

Finally the user has two methods of leaving the Multiple Schedules 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.

2. Implementation of Type516.exe and the Type516 Component in the Simulation Studio

Type516.exe is a Simulation Studio plugin. Plugins offer an alternative method for entering parameters and inputs. Once Type516 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 4. Clicking the icon in the lower left hand corer of the window will launch Type516.exe, allowing you to set the appropriate schedule.

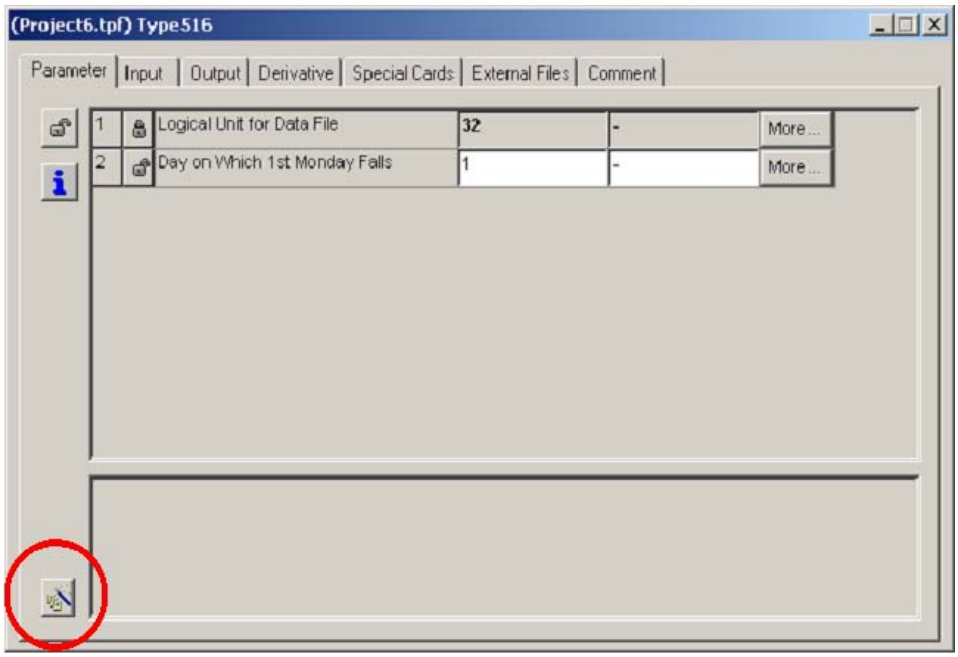


Figure 4: Data Entry when a Plugin is Available

3. Implementation of MultSched.exe and the Type516 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 end user. For example, if the TRNSED programmer wishes to allow the end user to enter a heating or cooling set point schedule, s/he is limited to using groups controlled by a radio buttons, or to adding enough sequential numerical value fields into the TRNSED interface to accommodate the entire schedule. Type516 and its companion program (multsched.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 multsched application is launched and the end user can set up the schedule of hourly temperature set points 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 5 shows what the TRNSED end user might see in this example's implementation of Type516. The text and button in the figure below are contained in bitmap images called Hstat.bmp and Cstat.bmp.

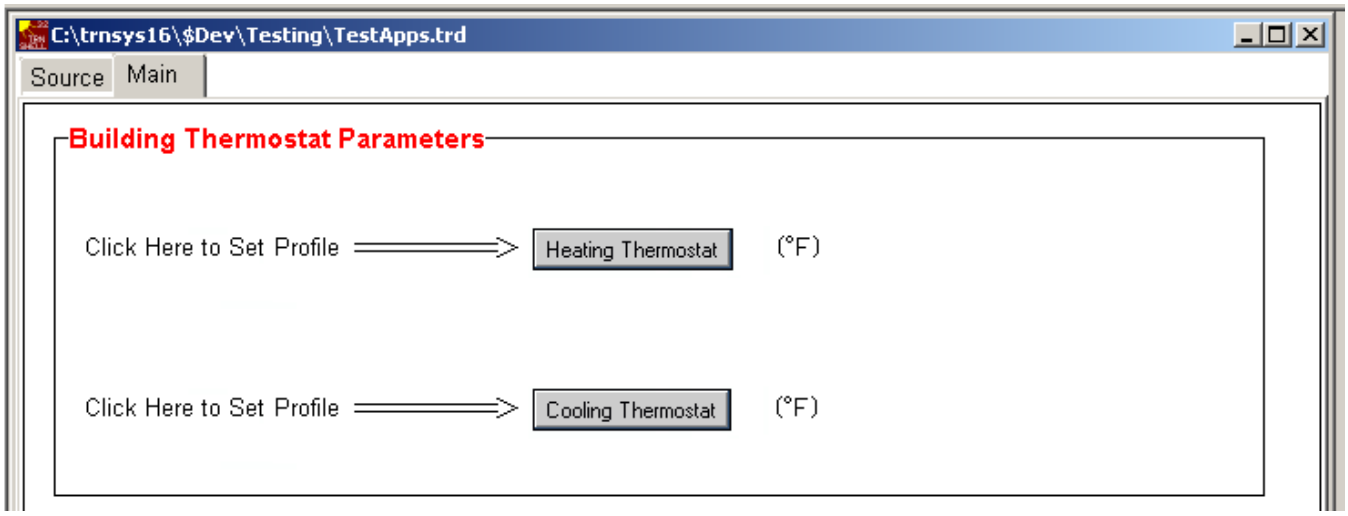


Figure 5: A Clickable Button in TRNSED. Clicking the button launches the MultSched.exe Application

The TRNSED source required to create Figure 5 is as follows:

```
*|[TSTAT|Building Thermostat Parameters
*|<APPLINK2> \trnsys16\images\HstatB.bmp file=\trnsys16\AppDat\hstat.dat   LEFT
*|<APPLINK2> \trnsys16\images\CstatB.bmp file=\trnsys16\AppDat\cstat.dat   LEFT
ASSIGN \trnsys16\AppDat\hstat.dat                          21
ASSIGN \trnsys16\AppDat\hstat.dat                          22
*|]

. . .

UNIT 15 TYPE 516 - WEEKLY HEATING SET POINT FORCING FUNCTION SCHEDULER (MULTSCHED.EXE)
PARAMETERS 2
21          !logical unit of data file
1           !day of the week on which the simulations starts

UNIT 20 TYPE 516 - WEEKLY COOLING SET POINT FORCING FUNCTION SCHEDULER (MULTSCHED.EXE)
PARAMETERS 2
22          !logical unit of data file
1           !day of the week on which the simulations starts
```

In the above, each of the <APPLINK2> keywords 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 APPLINK2 (in this case MultSched.exe) will be launched and will load the file indicated by the second argument. In this case, it is the *.dat file that contains the hourly 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 APPLINK2 in the TRNEdit File: Setup Menu is directed to MultSched.exe. The Link Tab might be set as follows:

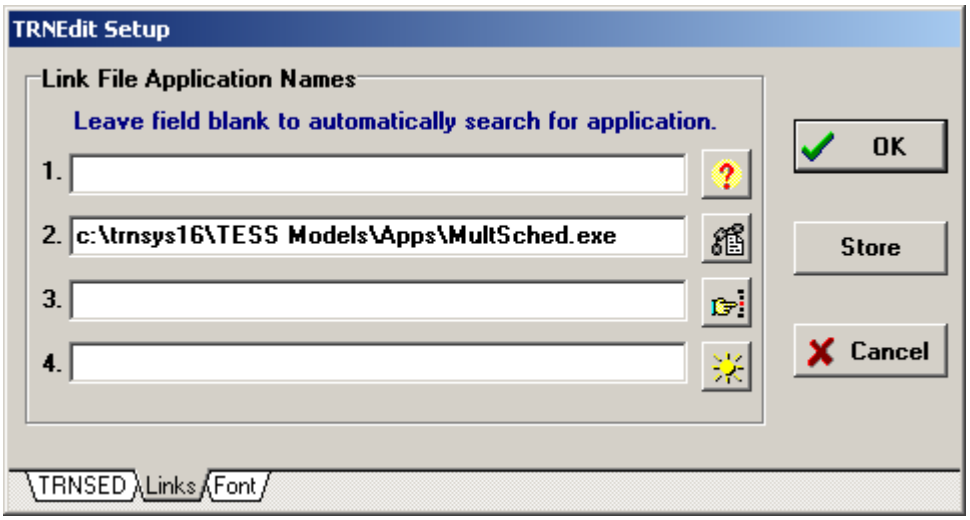


Figure 6: The TRNEdit Links Setup

When the end user clicks on one of the two buttons, c:\trnsys16\Tess Models\Apps\MultSched.exe is launched with either the file "c:\trnsys16\AppDat\hstat.dat" or with "c:\trnsys16\AppDat\cstat.dat." Once the user has made and saved their changes to the slider values, MultSched records those changes in the appropriate .dat file. Later in the TRNSED input file, the same files are ASSIGNed to logical unit numbers. The data files are read by Type516 during the simulation and the Type outputs appropriate values of the heating or cooling set points for each hour of the simulation.