TYPE 519: HOLIDAY SCHEDULER

General Description

The Holiday Scheduler utility programs (Type519.exe and Scheduler.exe) and TRNSYS Type 519 are used in conjunction with one another to input and read a holiday schedule. A holiday schedule denotes which days of the year are holidays. This type of schedule is very useful when trying the match the actual operation of a building or calibrate a simulation to measured data or when switching between "occupied" and "unoccupied" building schedules.

Two applications are provided: Type519.exe is a plugin for use with the TRNSYS Simulation Studio while Scheduler.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 Type519.exe and Scheduler.exe since operationally they are identical. Type519.exe and Scheduler.exe differ only in the format of data that they pass to the program that called them. A second section describes the use of Type519 and Type519.exe within the TRNSYS Simulation Studio environment. The third section of the Detailed Description describes the application of Scheduler.exe in TRNSED distributable applications.

Detailed Description

1. Use of the Scheduler Programs

The Scheduler program has multiple input screens. The first screen is used to maintain the file that stores the holiday schedule and to set the period of the schedule, as shown in Figure 1.

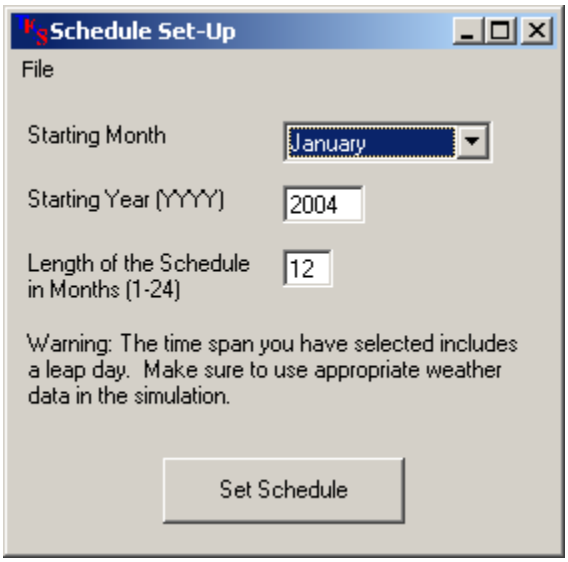


Figure 1: Schedule Duration

At the top of the screen shown in Figure 1 is the file menu which controls the selection of the file that will store the values and be read in by TRNSYS as well as the control of the program. The user can select "Open" from the menu to open an existing file, "Save" to save the current values to a file, or "Exit" to leave the program.

The period of the schedule is set by selecting the starting month and entering the starting year and the schedule length in months. Schedules can be as short as a single month or as long as 2 years (24 months). If the period selected contains the February of a leap year, a warning message will appear telling the user that a leap day is included in the schedule. It is important to note this fact and to make sure that appropriate weather data and simulation lengths that also include a leap day are used in TRNSYS.

Once the schedule period has been entered, pressing the “Set Schedule” button will activate the second input screen where the actual schedule can be selected.

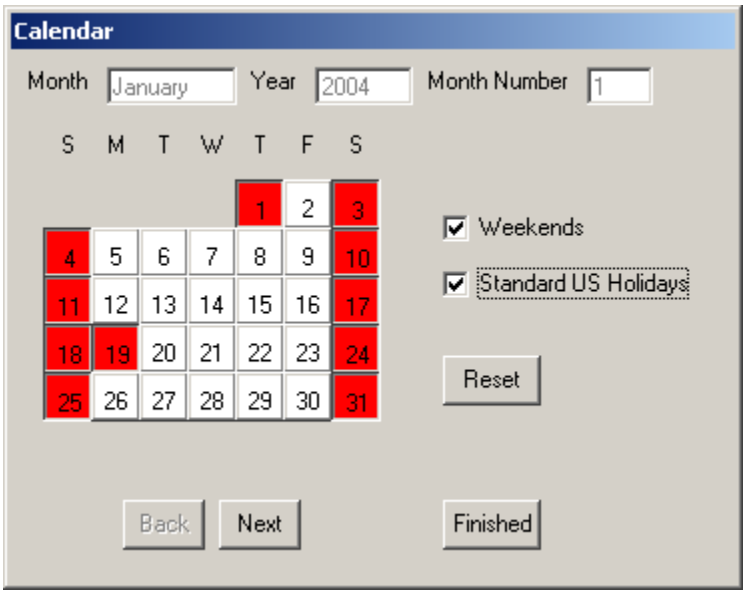


Figure 2: Specification of Holidays

At the top of the screen the current month and year being specified is displayed. In addition the month number of the schedule is also displayed. This value is not necessarily the month of the year, but denotes which month in the schedule sequence it is.

On the left side of the window is the calendar for that specific month. This calendar is used to select which days are holidays and to display the currently selected holidays. The days which have been selected as holidays are displayed in red and non-holidays in white. To change a day from non-holiday to holiday or vice versa, simply click on the day using the mouse.

On the right side of the screen are some selection shortcuts. To automatically select all weekend days as holidays select the “Weekends” check box. Un-selecting the checkbox will set all the weekend days to non-holidays. Selecting the “Standard US Holidays” checkbox will automatically select all of the official US Federal holidays as scheduled holidays. Again un-selecting the checkbox will set the holidays to non-holidays. Pressing the “Reset” button will set all of the days in the schedule period to non-holidays.

The buttons at the bottom of the window control the active month of the schedule. Pressing the “Back” and “Next” buttons will navigate through the various months in the schedule period. If the currently active month is either the first or last month in the period the appropriate button will be inactive.

Pressing the “Finished” button at the lower right of the window will return to the first input screen where the file can be saved and the program exited.

2. Implementation of Type519.exe and the Type519 Component in the Simulation Studio

Type519.exe is a Simulation Studio plugin. Plugins offer an alternative method for entering parameters and inputs. Once Type519 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 3. Clicking the icon in the lower left hand corer of the window will launch Type519.exe, allowing you to set the appropriate schedule.

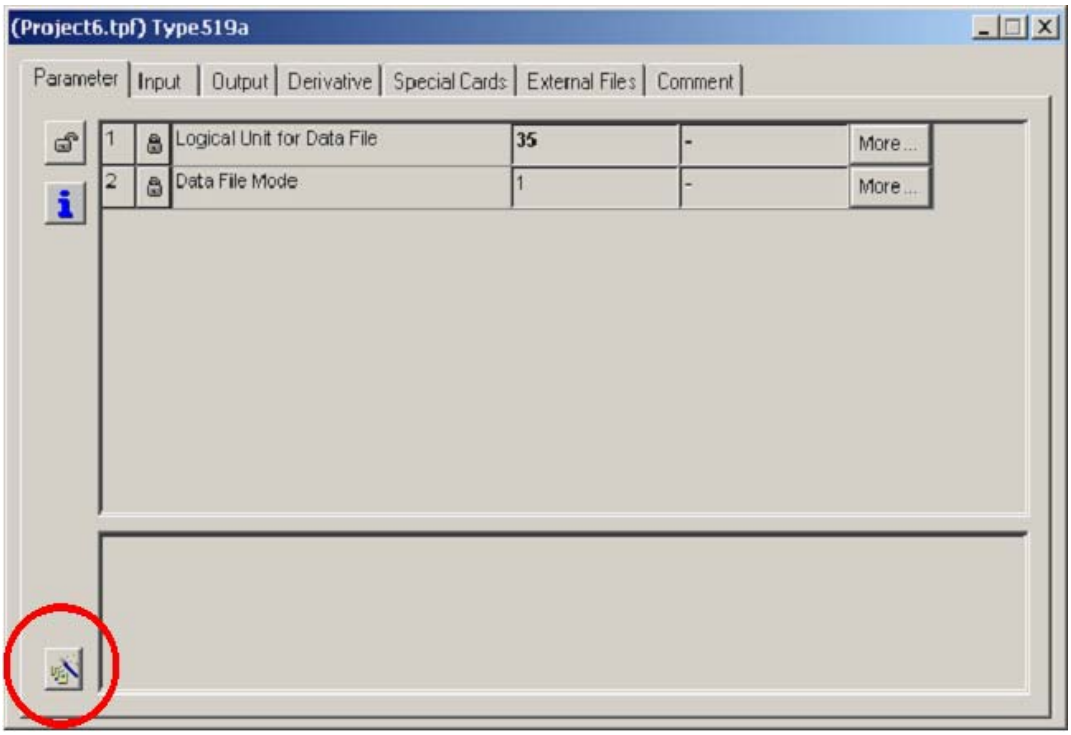


Figure 3: Data Entry when a Plugin is Available

3. Implementation of Scheduler.exe and the Type519 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. One of the most difficult types of data to enter into TRNSED is the schedule of holidays and weekends during which a building’s heating and cooling set points might be set in an energy saving mode. Type519 and its companion program (scheduler.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 Scheduler application is launched and the end user can set up the schedule of holidays and weekends for an entire year. The following example shows a possible implementation in TRNSED. Please refer to the TRNSED/TRNEdit manual for more information regarding the syntax used.

Figure 4 shows what the TRNSED end user might see in this example's implementation of Type519. The text and button in the figure below are contained in a bitmap image called holiday.bmp.

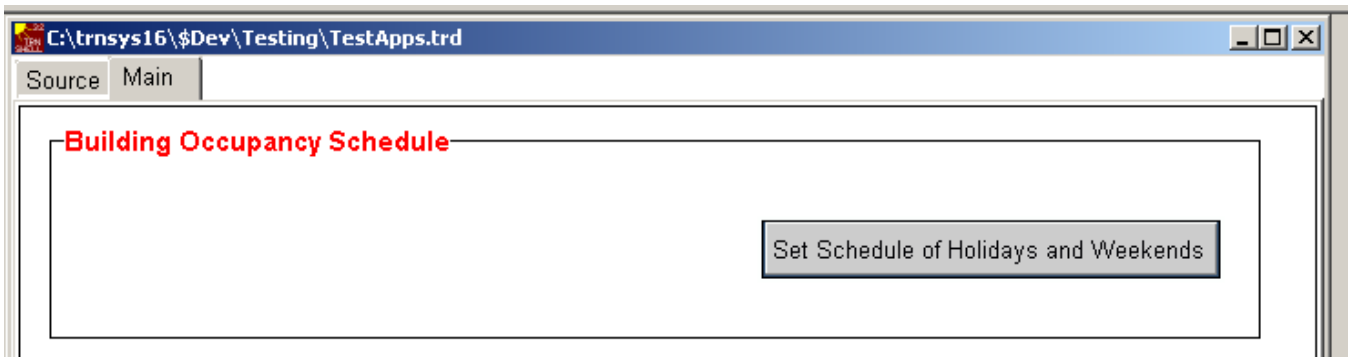


Figure 4: A Clickable Button in TRNSED. Clicking the button launches the MultSched.exe Application

The TRNSED source required to create Figure 4 is as follows:

```
*|[HoliDisplay|Building Occupancy Schedule
*|<APPLINK4> \trnsys16\images\holiday.bmp file=\trnsys16\AppssDat\T519dat.hol   RIGHT
ASSIGN "\trnsys16\AppssDat\T519dat.hol "  25
*|]

...

UNIT 30 TYPE 519 - ON/OFF DAILY FORCING FUNCTION (SCHEDULER.EXE)
PARAMETERS 2
25          !logical unit of data file
1           !day of the week on which the simulations starts
```

In the above, the <APPLINK4> 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 APPLINK4 (in this case Scheduler.exe) will be launched and will load the file indicated by the second argument. In this case, it is the *.hol file that contains the holiday 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 Scheduler.exe. The Link Tab might be set as follows:

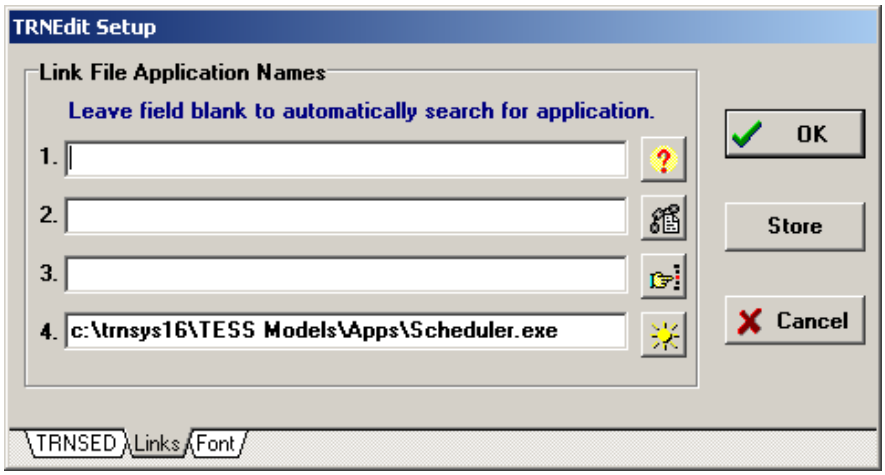


Figure 5: The TRNEdit Links Setup

When the end user clicks on the button, c:\trnsys16\Tess Models\Apps\Scheduler.exe is launched with the file “c:\trnsys16\AppDat\T519dat.hol.” Once the user has made and saved their changes to the slider values, Scheduler records those changes in the appropriate .hol file. Later in the TRNSED input file, the same files are ASSIGNed to logical unit numbers. The data files are read by Type519 during the simulation and the Type outputs appropriate values indicating whether the current day is a holiday, a weekend, or a weekday.