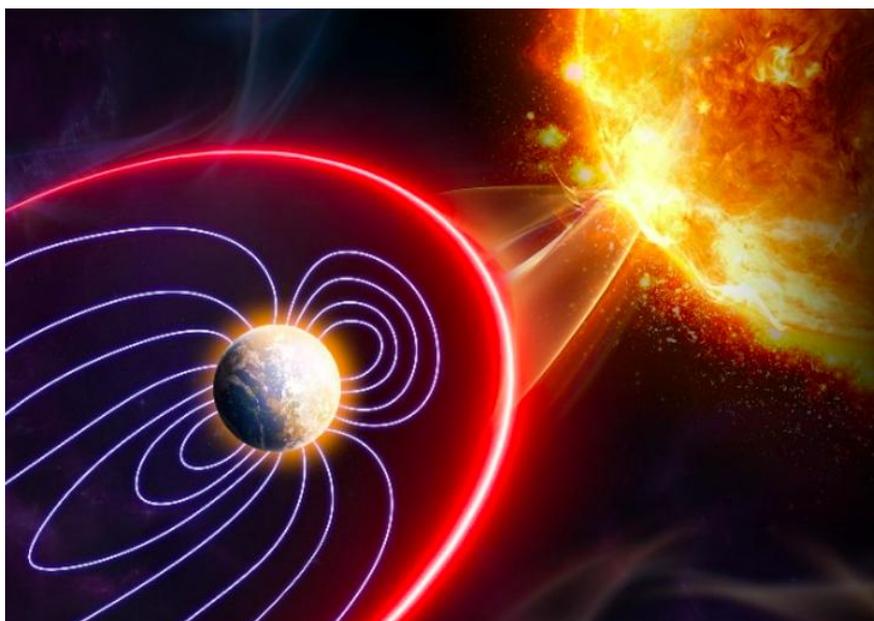


# SolarData

(Version 7.1.0 -- Released: April 16, 2025)



# Users Guide

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## INTRODUCTION

**SolarData.exe** is a utility to display the latest solar activity numbers on your screen. The following data is displayed:

- Solar Flux Index (SFI)
- A-Index (Ap)
- K-Index (Kp)
- Sunspot Number (SN)
- Radio Blackout Level (X-Ray flux)

The data is updated periodically from text documents available on the NOAA Space Weather Prediction Center website.

## SYSTEM REQUIREMENTS

**SolarData** requires Windows Vista or later. It is a 32-bit application, and therefore will run on a computer with either a 32-bit or a 64-bit processor.

**Adobe Acrobat Reader®**, or a similar program capable of displaying .pdf files, is required to view the program documentation.

## INSTALLATION

Run the installation package file, **SolarData Setup.exe**. This will install **SolarData.exe** and all required supporting files on your computer. The installer will suggest a default location for the program file. You may change the location or leave it at the default, it does not matter.

## PROGRAM OPERATION

**SolarData.exe** displays 4 small boxes containing the data. By default, the display is positioned in the upper-left corner of the display. The text & background colors for each item varies according to the current value (low, medium, high). A sample display is shown in **Figure 1**.



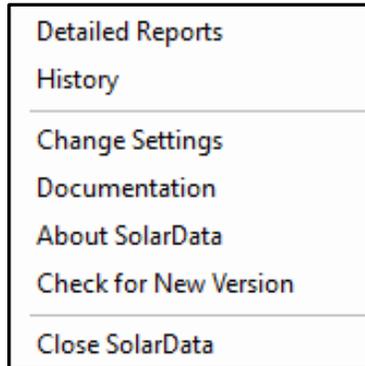
Figure 1 -- Main Display

## SETTING THE DISPLAY POSITION

To position the display on the screen, place the cursor over the display and press the left mouse button. Drag the display to the desired position and release the mouse button.

## POP-UP MENU

Right-clicking on the **SolarData** window, or by right-clicking on the **SolarData** icon in the system tray, will display the pop-up menu shown in Figure 2.



**Figure 2 -- Menu**

The menu has the following items:

- **Detailed Reports** – Selecting this menu item will allow you to view the documents that were downloaded from the NOAA website to obtain the data being displayed. See the section titled *Detailed Reports* for more information.
- **History** – Selecting this menu item will allow you to view graphs of the data for the last 30 days and 7 days. See the section titled *History* for more information.
- **Change Settings** -- Selecting this menu item will allow you change the program settings and to customize the display colors. See the section titled *Program Settings* for more information.
- **Display Documentation** -- Selecting this menu item will display the program documentation (this document).
- **About SDRSliceLabel** -- Selecting this menu item will display basic information about the program.
- **Close SDRSliceLabel** -- Selecting this menu item will close the program.

## DETAILED REPORTS

Selecting *Display Detailed Reports* from the pop-up menu will display the window shown in Figure 3 and in Figure 4. The window has 2 tabs. The first tab (Figure 3) displays the document used to obtain the Solar Flux Index and sunspot number values. The second tab (Figure 4) displays the document used to obtain the Ap and Kp index values.

Both documents have historical data covering the past 30 days.

```

:Product: Daily Solar Data          DSD.txt
:Issued: 1425 UT 09 Nov 2024
#
# Prepared by the U.S. Dept. of Commerce, NOAA, Space Weather Prediction Center
# Please send comments and suggestions to SWPC.Webmaster@noaa.gov
#
# Last 30 Days Daily Solar Data
#
#
#          Sunspot      Stanford GOES15
#          Radio  SESC   Area   Solar  X-Ray  ----- Flares -----
#          Flux  Sunspot 10E-6 New   Mean  Bkgd   X-Ray  Optical
#          Date  10.7cm Number Hemis. Regions Field Flux  C  M  X  S  1  2  3
#-----
2024 10 10 216   150   1460   2  -999   *  4  4  0  4  0  0  0
2024 10 11 214   130   1445   0  -999   *  6  2  0  4  0  0  0
2024 10 12 214    95   1080   0  -999   *  5  0  0  7  0  0  0
2024 10 13 195   108   1270   2  -999   *  3  0  0  6  0  0  0
2024 10 14 182   146   1380   2  -999   *  9  2  0  8  0  0  0
2024 10 15 172   141   1290   1  -999   * 17  5  0 14  4  1  0
2024 10 16 168   135    900   0  -999   * 13  6  0 16  3  0  0
2024 10 17 174   146   1020   1  -999   *  8  2  0  1  0  0  0
2024 10 18 165   132    820   3  -999   *  9  3  0  3  0  0  0
2024 10 19 162   101    570   0  -999   *  7  2  0  0  0  0  0
2024 10 20 162   113    610   2  -999   *  3  0  0  2  0  0  0
2024 10 21 164   168    880   3  -999   *  1  0  0  2  0  0  0
2024 10 22 176   130    610   0  -999   *  3  0  0  3  0  0  0
2024 10 23 185   104    610   1  -999   *  9  0  0  6  1  0  0
2024 10 24 197   138   1300   4  -999   *  1  1  1  5  0  0  0
2024 10 25 209   157   1140   3  -999   *  7  1  0  4  0  0  0
2024 10 26 238   181   1220   0  -999   *  3  4  1  7  0  0  1
2024 10 27 246   198   1330   2  -999   *  8  1  0  9  1  0  0
2024 10 28 255   288   1670   0  -999   * 12  3  0 12  1  0  0
2024 10 29 266   220   2130   1  -999   *  4  1  0  1  1  0  0
... ..

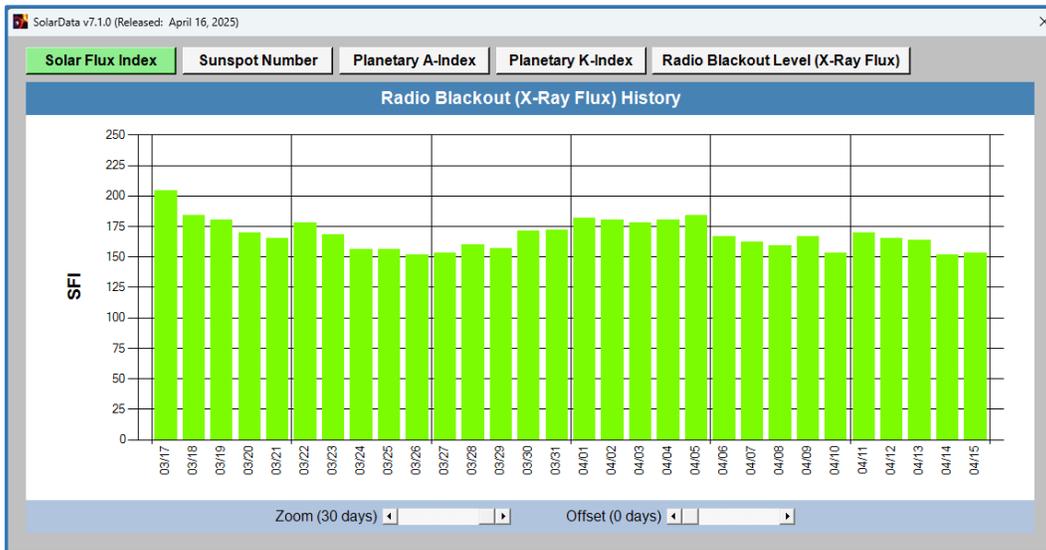
```

Figure 3 – Detailed Reports Window (Solar Data Details Tab)

## HISTORY

Selecting *History* from the pop-up menu will display the window shown in Figure 4. Clicking on the buttons switches between charts of the following types of historical data:

- Solar Flux Index (SFI) – 30 days, 1-day intervals.
- Sunspot Number (SN) -- 30 days, 1-day intervals.
- Planetary A-Index (Ap) -- 30 days, 1-day intervals.
- Planetary K-Index (Kp) – 30 days, 3-hour intervals
- Radio Blackout Level (X-Ray Flux) – 7 days, 1-hour intervals.



**Figure 4 – Historical Data**

The window has two sliders, Zoom & Offset. The Zoom slider allows zooming in to see the Kp data in a selected range between 1 and 30 days. The offset slider selects the starting date of the range to be displayed. The sliders are not available on the Radio Blackout Level chart.

## PROGRAM SETTINGS

Selecting *Program Settings* from the pop-up menu will display the window shown in Figure 5. This window is used to change the program settings and to customize the colors used to display the data and to change the values at which the colors change.

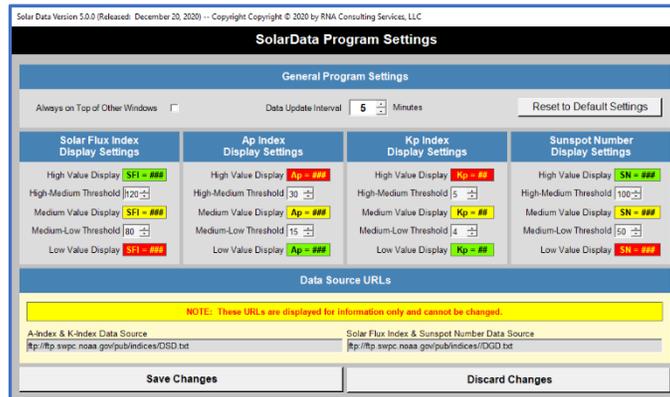


Figure 5 – Program Settings Window

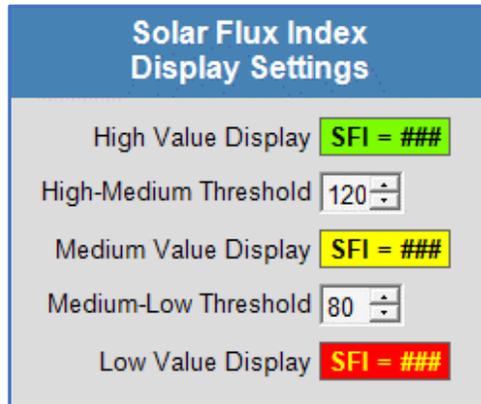
The top section of the window has the following items:

- **Always on Top Check Box** – If this box is checked, the **SolarData** window will always be on top of any other programs that may be running. By default, the box is not checked.
- **Data Update Interval Box** – The value in this box specifies, in minutes, how often **SolarData** will download new documents from NOAA and update the display. The value may be anything between 1 minute and 1,440 minutes (1 day). The default value is 5 minutes.
- **Reset to Default Settings Button** – Clicking on this button will reset all settings to their default values.

## SETTING THE DISPLAY POSITION

Each of the 4 data items (SFI, Ap, Kp, SN) shown in the main display can be displayed in 3 different color combinations based on the value of the data. The center section of the window is used to customize these color combinations. The customization settings for each of the 4 data items are the same. A close-up view of the settings for one of the data items is shown in Figure 6.

Each data item has 5 display settings that can be customized. These settings allow dividing the data item display into 3 ranges of values (high, medium, & low), and to determine what colors are used to display values in each range.



**Figure 6 – Value Display Settings**

The 5 display settings for each data item are:

- **High Value Display** – This setting determines the colors used to display a value that is in the high value range. How to change this setting is described in the *Changing Display Colors* section.
- **High-Medium Threshold** – This setting determines the boundary between the high value range and the medium value range for the data item. A value equal to or greater than the threshold is in the high range, and a value below the threshold is in the medium range. This setting **MUST** be set to a value equal to or greater than the *Medium-Low Threshold* setting. If it is not, both threshold settings will flash red.
- **Medium Value Display** – This setting determines the colors used to display a value that is in the medium value range. How to change this setting is described in the *Changing Display Colors* section.
- **Medium-Low Threshold** – This setting determines the boundary between the medium value range and the low value range for the data item. A value equal to or greater than the threshold is in the medium range, and a value below the threshold is in the low range. This setting **MUST** be set to a value equal to or less than the *High-Medium Threshold* setting. If it is not, both threshold settings will flash red.
- **Low Value Display** – This setting determines the colors used to display a value that is in the low value range. How to change this setting is described in the *Changing Display Colors* section.

**NOTE:** The theoretical minimum value of the Solar Flux Index (SFI) is 64. Therefore, the SFI threshold boxes will flash red if either threshold is set to less than 64.

## CHANGING DISPLAY COLORS

The display color combinations are changed by left-clicking or right-clicking on the display color with the mouse. Left-clicking on the display color will allow you to select the text color, and right-clicking on the display color will allow you to select the background color.

In either case, the window shown in Figure 7 will be displayed. Select the desired color by clicking on it and clicking on *Okay*.



Figure 7 –Color Selection Window

## SOFTWARE LICENSE AGREEMENT

The installation and use of **SolarData** indicates your agreement to adhere to the terms listed below:

Software written by Ray Andrews, K9DUR, for amateur radio use may be freely copied by any licensed amateur radio operator for their own personal use.

Other than the cost of the distribution media, no fee may be charged for the distribution of the software to any other party or parties.

No commercial use of the software may be made by any party without the express written consent of:

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150 West Lyon Avenue  
West Terre Haute, IN 47885-9386

Although the software is free, it is not open source. The programming techniques used in the development of the software are proprietary to RNA Consulting Services. The software may not be reverse engineered or de-compiled for any purpose.

No warranty, expressed or implied, is conveyed for the use of the software or for the installation of the software on any computer.

## ABOUT THE AUTHOR

**SolarData** was written by Ray Andrews, K9DUR.

Ray holds an Amateur Extra class license and was first licensed in April 1960. He currently resides in West Terre Haute, IN, and is a retired electronic design engineer and software developer.

For more information, visit Ray's web page: <http://k9dur.us>

## REVISION HISTORY

- v7.1.0 – Apr 16, 2025 – Added Radio Blackout Level history chart.
- v7.0.0 – Nov 09, 2024 – Added Radio Blackout Level data.
- v6.2.4 – Sep 14, 2024 – Fixed bug causing false K-Index error during 1<sup>st</sup> 3-hour period of the day.
- v6.2.3 – Aug 18, 2024 – Corrected K-index history title.
- v6.2.2 – Jun 21, 2024 – Switched from FTP download of solar data to HTTP download.
- v6.2.1 – May 24, 2024 – Corrected range of zoom slider.
- v6.2.0 – May 22, 2024 – Removed 7-day chart & added zoom & pan for all graphs.
- v6.1.1 – May 18, 2024 – Fixed bug in history button colors.
- v6.1.0 – May 16, 2024 – Added zoom & pan to 30-day Kp graph.
- v6.0.0 – May 14, 2024 – Added historical graphs.
- v5.4.1 – May 11, 2024 – Corrected K-index from first value on line to the last value that is not equal to -1.
- v5.4.0 – Jan 01, 2024 – Changed settings storage from XML file to registry.
- v5.3.0 – Dec 27, 2023 – Added version checking.
- v5.2.0 – Dec 24, 2023 – Changed file download method to FTP to correct file download failure.
- v5.1.1 – Nov 12, 2023 – Corrected URLs used to download data. Fixed code that parses SFI & SSN file.
- v5.1.0 – Nov 12, 2023 – Change location of source documents used to gather data.
- v5.0.3 – Dec 17, 2022 – Corrected display of K-index when no data from NOAA.
- v5.0.2 – Nov 26, 2022 – Changed geomagnetic data parsing algorithm to account for changes in NOAA document format.
- v5.0.1 – Jan 25, 2021 – Corrected system tray & popup menu labels.
- v5.0.0 – Dec 26, 2020 – Complete rewrite.
- v4.0.2 – Oct 14, 2017 – Corrected donation page URL.
- v4.0.1 – Dec 12, 2014 – Changed default URL's for SWPC documents.
- v4.0.0 – Jan 21, 2013 – Added ability to position display anywhere on the screen. Moved setup parameters to .xml file. Redesigned setup form to use toolbar.
- v3.1.2 – Feb 15, 2012 – Fixed bug causing no A-index or K-index data to be displayed between 0000 UTC & 0300 UTC.
- v3.1.1 – Dec 30, 2011 – Added code to correct display when no data available.
- v3.1.0 – Dec 21, 2011 – Changed NOAA source documents & re-wrote text parser.
- v3.0.0 – Jul 15, 2011 – Complete re-write. Added user manual.