

# McIDAS-V Tutorial

## Displaying Point Observations

updated August 2009 (software version 1.0beta4)

McIDAS-V is a free, open source, visualization and data analysis software package that is the next generation in SSEC's 35-year history of sophisticated McIDAS software packages. McIDAS-V displays weather satellite (including hyperspectral) and other geophysical data in 2- and 3-dimensions. McIDAS-V can also analyze and manipulate the data with its powerful mathematical functions. McIDAS-V is built on SSEC's VisAD and Unidata's IDV libraries, and contains "Bridge" software that enables McIDAS-X users to run their commands and tasks in the McIDAS-V environment. The functionality of SSEC's HYDRA software package is also being integrated into McIDAS-V for viewing and analyzing hyperspectral satellite data.

McIDAS-V is currently a beta version of the software, which means that the software may contain bugs and not always work as expected. If you encounter any errors, please send them to the McIDAS Help Desk at [mug@ssec.wisc.edu](mailto:mug@ssec.wisc.edu). You will be notified at the startup of McIDAS-V when new versions are available on the McIDAS-V webpage - <http://www.ssec.wisc.edu/mcidas/software/v/>. More training materials are available on the McIDAS-V webpage and in the Getting Started chapter of the McIDAS-V User's Guide, which is available from the Help menu within McIDAS-V.


This tutorial assumes that you have McIDAS-V installed on your machine, and that you know how to start McIDAS-V. If you can not start McIDAS-V on your machine, you should follow the instructions in the document entitled *McIDAS-V Tutorial – Installation and Introduction*.

In this McIDAS-V Tutorial, each exercise will use real-time access to default remote servers. You must have internet access to complete this lesson. If you have access to your own real-time ADDE servers, you may also use those, but be aware that different server configurations may make the explanations in this document not quite applicable to all data that you may load.

Note: Users of data from the SSEC Data Center can use the "Import from URL" feature of the ADDE Server Manager and automatically include all of the SSEC Data Center servers in the McIDAS-V server lists. From the main menu, select **Edit -> Preferences -> ADDE Servers -> Import From URL** and enter the URL (<http://www.ssec.wisc.edu/mcidas/software/v/addeservers.xml>), your User ID, and Project #.

## Plotting and Contouring Surface Point Observations around the world

1. Remove all layers and data sources from the previous displays.
2. If you have created more than one tab, close the extra tabs by clicking on the "X" in the right corner of the tabs.
3. Select the **Point Observations -> Plot/Contour** chooser.
  - a. Connect to [adde.ucar.edu](http://adde.ucar.edu) with the Dataset RTPTSRC.
  - b. Choose the **SFCHOURLY - Real-Time SFC Hourly Point Type**.
  - c. Select the most recent time and click **Add Source**.
  - d. In the **Field Selector**, select **Point Data** in the **Fields** panel.

- e. In the lower-right panel, click the Layout Model tab and click METAR to select *Observations>Temperature* to plot all available temperatures.
  - f. Click **Create Display**. The default display is a world projection with temperatures plotted from around the world. As you zoom in you will see more stations appear in the plot.
4. Reset the display projection.
  5. Return to the *Data Sources* tab and select the *Satellite -> Imagery* chooser.
    - a. Connect to the adde.ucar.edu server with the dataset RTIMAGES
    - b. Select an **Image Type** of *GOES-East 0.65 um Visible*, select the most recent image and create the display.
  6. To contour the temperatures plotted on the screen, return to the Field Selector
    - a. Click on the “SFCHOURLY” data source.
    - b. In the **Fields** tab, click on the  icon next to Gridded Fields, and select T from the list of available Fields.
    - c. Select Contour Plan View in the List of Displays, and **Create Display**. The contour properties can be changed in the *Layer Controls* tab of the Contour Plan View.

## Creating Time Series of Point Observations

1. Remove all layers and data sources.
2. Return to *Point Observations -> Plot/Contour* source in the *Data Sources* tab
  - a. Select a group of times from the **Absolute** time tab (to select more than one time, use *Control-Click* or *Shift-Click*), and click **Add Source**.
  - b. Select *Point Data* in the **Fields** panel and click **Create Display** to plot the default station models.
3. In the *Layer Controls*, follow these steps:
  - a. Click on the **Plot** tab to create a time series.
  - b. Zoom in over a station in the main display and click on the center of it. The station information should fill into the table below the plot in the *Layer Controls*.
  - c. Add the temperature to the plot by right clicking on the T field in the table and selecting **Add To Chart**.

## Problem Sets

The previous examples were intended to give you a general knowledge of how to load and display surface and upper air point data. The problem sets below are intended to introduce you to new topics related to the data, as well as challenge your knowledge of McIDAS-V. We recommend that you attempt to complete each problem set before looking at the solutions, which are provided below the problem set.

1. Create a time series of surface Temperature, Dewpoint Temperature and Wind Barbs for the last 24 hours over Chicago (KORD). Change the Temperature and Dewpoint Temperature axes in the plot so they have the same range. Look at the current zone forecast for Chicago to check the accuracy of the forecast for today. (Hint: Weather text products can be found under *Tools->Text Data*)
2. Modify the chart from problem #1 so you have three separate charts: Place Wind Barbs and Gusts in the top left chart, Pressure in the top right chart, and Temperature and Dewpoint Temperature in the bottom chart (Hint: Change the chart names to separate out parameters!)
3. Create your own station model layout that display the Dewpoint Depression in green over the center of the station with the station ID below the Dewpoint Depression, the Temperature to the upper left, and Dewpoint Temperature to the upper right. Display the most recent observations using the new layout.

### Problem Set #1 – Solution

Create a time series of surface Temperature, Dewpoint Temperature and Wind Barbs for the last 24 hours over Chicago (KORD). Change the Temperature and Dewpoint Temperature axes in the plot so they have the same range. Look at the current zone forecast for Chicago to check the accuracy of the forecast for today. (Hint: Weather text products can be found under *Tools->Text Data*)

1. Remove all layers and data sources from the previous display.
2. Return to the *Data Sources* tab, select the Surface Hourly **Point Type** and the 24 most recent times with the interval set to Hourly, and create the Point Data Plot display.
3. Use the *Zooming and Panning* controls to zoom in over Chicago, and left-click on the Chicago Ohare International station (KORD).
4. In the *Layer Controls*, click on the **Plot** tab, and at the bottom, scroll down through the list of fields until you find temperature (T).
5. Right-click on T and select **Add to Chart**, and repeat for dewpoint temperature (TD).
6. To add wind barbs, add speed (SPD) and direction (DIR) to the chart. When both of these parameters are added, they are converted into windbarbs.
7. Right-click on the table of fields and select **T -> Chart Properties**.
  - a. In the Range: property, enter in a Min and Max value appropriate for both Temperature and Dewpoint Temperature. Click **OK**.

8. Right-click on the table of fields and select **TD -> Chart Properties**.
  - a. To the right of the Range: property, there is a ... button. Click on this button and select “Fixed Range from T...”, and click **OK**.
9. Open up the Weather Text Product Display by selecting *Tools->Text Data->Weather Text Products (from server)*.
  - a. Open up the *Public Products->Zone Forecasts*.
  - b. In the main display window, zoom in over Illinois and click on KLOT. The zone forecast for KLOT, including Chicago will now be shown in the weather text product window.

### Problem Set #2 – Solution

Modify the chart from problem #1 so you have three separate charts: Place Wind Barbs and Gusts in the top left chart, Pressure in the top right chart, and Temperature and Dewpoint Temperature in the bottom chart (Hint: Change the chart names to separate out parameters!)

1. Return to the Temperature chart properties by right-clicking on the table of fields and selecting **T -> Chart Properties**.
  - a. Enter in “Temperature” in the **Chart Name**.
  - b. Click **OK**. The Temperature plot should appear in a new chart below the current plot titled “Plot”.
2. Repeat this step for Dewpoint Temperature and place it in the “Temperature” plot.
3. Add Wind Gusts and pressure to the charts and place pressure in a separate chart titled “Pressure”.
4. Select **View -> Chart -> Layout -> Change Grid Layout** from the **Layer Control** menu.
  - a. Use the **Columns** and **Rows** buttons to add/remove new columns and rows.
  - b. Left-click and drag on a chart to move it to a different location.
  - c. Use the black squares around the individual charts to control their width and length.

### Problem Set #3 – Solution

Create your own station model layout that displays the Dewpoint Depression in green over the center of the station with the station ID below the Dewpoint Depression, the Temperature to the upper left, and Dewpoint Temperature to the upper right. Display the most recent observations using the new layout.

1. Remove all layers.
2. In the main menu select **Tools -> Station Model Template**.
3. In the editor, select **File -> New** and enter in “Dewpoint Depression” for the name of the layout.

4. Click on “123 Value” and click in the middle of the layout. The Properties Dialog box will pop up.
5. In the Parameter:, enter in: **=T-TD**
6. Change the Foreground Color to green, and click OK.
7. Add a Temperature and Dewpoint Temperature value in the appropriate locations.
8. In the editor select **File -> Save** and then close the window.
9. Load the most recent surface hourly data into the **Field Selector**.
  - a. In the **Fields** tab, select Point Data.
  - b. In the **Layout Model** tab in the lower right corner, change the model to “Dewpoint Depression.”.

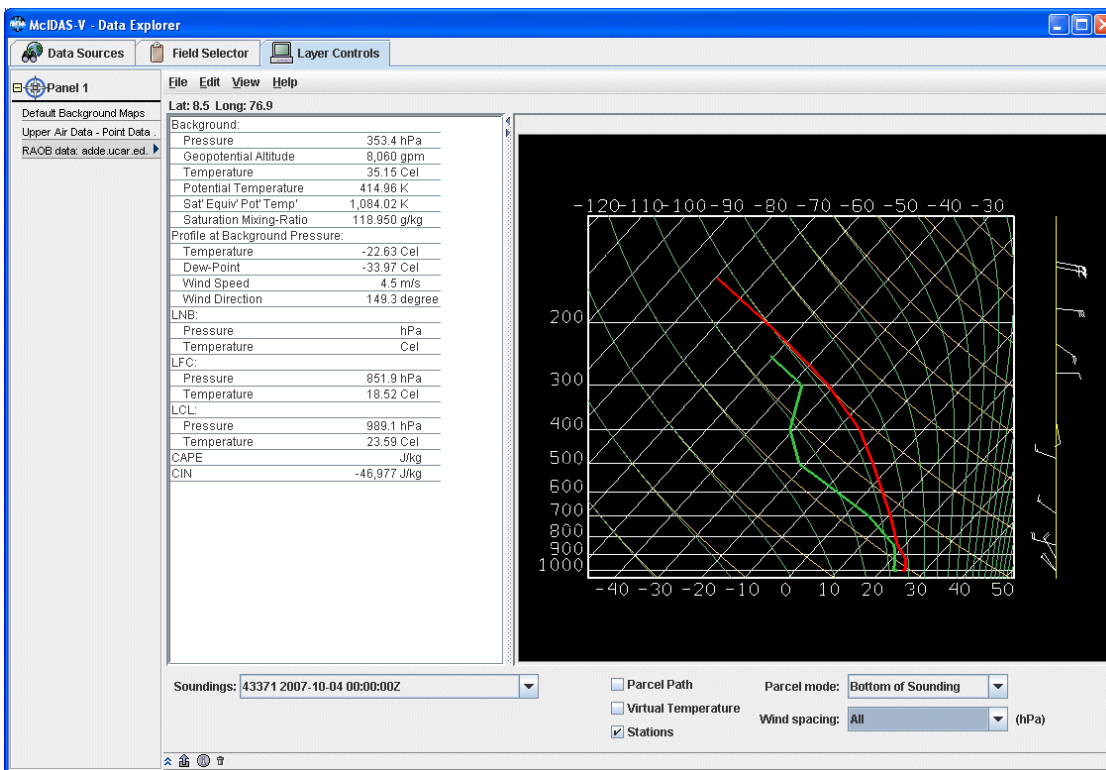
## Plotting Upper Air Observations

1. Upper Air point data can be loaded the same way as Surface Data.
  - a. Remove all layers and data sources.
  - b. Return to the **Data Sources** tab.
  - c. Choose the **UPPERMAND - Real-Time Upper Air (Mandatory) Point Type**.
  - d. Select the 5 most recent times.
  - e. Select an **Interval**: 12 Hourly.
  - f. Click **Add Source**.
  - g. In the **Field Selector**, select **Point Data** in the **Fields** panel.
  - h. In the Levels tab, select the pressure level to plot.
  - i. Click **Create Display**.

## Displaying RAOB Sounding Data

1. Select the **Point Observations -> Soundings -> Remote** source from the **Data Sources** tab.
2. Connect to the server adde.ucar.edu with the group RTPTSRC.
3. Select UPPERMAND for the Mandatory Levels, and UPPERSIG for the Optional Significant Levels.


4. Pick the station for your sounding display.
  - a. Use the zooming and panning buttons to find your station(s).
  - b. Select an available time and click on your station to see if a sounding is available. Available soundings will show up in the *Selected* box on the bottom right of the chooser.
  - c. If more than one is available for your station, select the most recent time and add the source.
  - d. Under the **Displays** tab of the *Field Selector*, you have the option to choose which type of thermodynamic diagram to display (Skew-T, Stuve, Emagram).
  - e. Select one of the thermodynamic diagrams and create the display.
5. The sounding will show up in a 2D display in the *Layer Controls* tab along with a list of thermodynamic parameters. As you move the mouse over the sounding, the thermodynamic parameters will update.



6. The temperature and dew-point traces can be modified via the cursor.
  - a. Press the left button on the first data-point to be modified and drag it horizontally along an isobar to the desired position, then move the pointer diagonally along an isotherm to keep the data-point at the desired position and to pick-up the next data-point.
  - b. Repeat until done and then release the mouse button.
  - c. To reset the sounding, go to *Edit ->Reset Sounding* in the main menu of the *Layer Controls* tab.

- d. You can also choose to display the parcel path or vertical temperature on the sounding using the checkboxes below the sounding. When the Stations box is checked, you will see a square box in the main display indicating the location of the sounding.

## Displaying Wind Profiler Observations

1. Remove all layers and data sources and turn on the **Auto-set Projection** option.
2. Select the *Point Observations -> Wind Profiler* source from the *Data Sources* tab.
  - a. Connect to **adde.ucar.edu** with the dataset RTPTSRC (alternatives: adde.cise-nsf.gov, stratus.al.noaa.gov, or weather2.admin.niu.edu).
  - b. Select a **Profiler Type** of *Real-Time 6 Minute Profiler Data*.
  - c. Select two stations and the 24 most recent times.
  - d. Use a 30 minute interval and load the data source.
  - e. Opening up the tree of the **Fields** tab in the *Field Selector* by clicking on the  icon will allow you to choose to display each station individually, or as a group if you leave *Profiler winds* selected.
  - f. Display all stations as a *Time/Height Display*, and the data will be displayed in the 2D display in the *Layer Controls* tab.
  - g. The 24 most recent times will be displayed, with the latest data on the left. This can be switched by turning off the **Latest Data on the Left** checkbox.
  - h. Change the display to different stations using the **Stations** pull down tab.
  - i. Modify the windbarb size and vertical interval to see how the display changes.
3. Return to the *Field Selector* and create a *3D view* display.
4. Zoom out of the display to see all of the stations, as the default zooms in on one of the stations.
5. Rotate the view so you are looking at the profiler displays from the south.
6. Use the **Time Animation Controls** to loop through the selected times and observe how the profiler displays change.
7. The windbarb size and vertical interval can be modified in the *Layer Controls* tab.

## Zooming, Panning, and Rotating Controls

Zooming	Panning	Rotating
	Mouse	
<p><b>Shift-Left Drag:</b> Select a region by pressing the <i>Shift</i> key and dragging the left mouse button.</p> <p><b>Shift-Right Drag:</b> Hold <i>Shift</i> key and drag the right mouse button. Moving up zooms in, moving down zooms out.</p>	<p><b>Control-Right Mouse Drag:</b> Hold <i>Control</i> key and drag right mouse to pan.</p>	<p><b>Right Mouse Drag:</b> Drag right mouse to rotate.</p>
	Scroll Wheel	
<p><b>Scroll Wheel-Up:</b> Zoom Out.</p> <p><b>Scroll Wheel-Down:</b> Zoom In.</p>		<p><b>Control-Scroll Wheel-Up/Down:</b> Rotate clockwise/counter clockwise.</p> <p><b>Shift-Scroll Wheel-Up/Down:</b> Rotate forward/backward clockwise.</p>
	Arrow Keys	
<p><b>Shift-Up:</b> Zoom In.</p> <p><b>Shift-Down:</b> Zoom Out.</p>	<p><b>Control-Up arrow:</b> Pan Down.</p> <p><b>Control-Down arrow:</b> Pan Up.</p> <p><b>Control-Right arrow:</b> Pan Left.</p> <p><b>Control-Left arrow:</b> Pan Right.</p>	<p><b>Left/Right arrow:</b> Rotate around vertical axis.</p> <p><b>Up/Down arrow:</b> Rotate around horizontal axis.</p> <p><b>Shift-Left/Right arrow:</b> Rotate Clockwise/Counterclockwise.</p>