

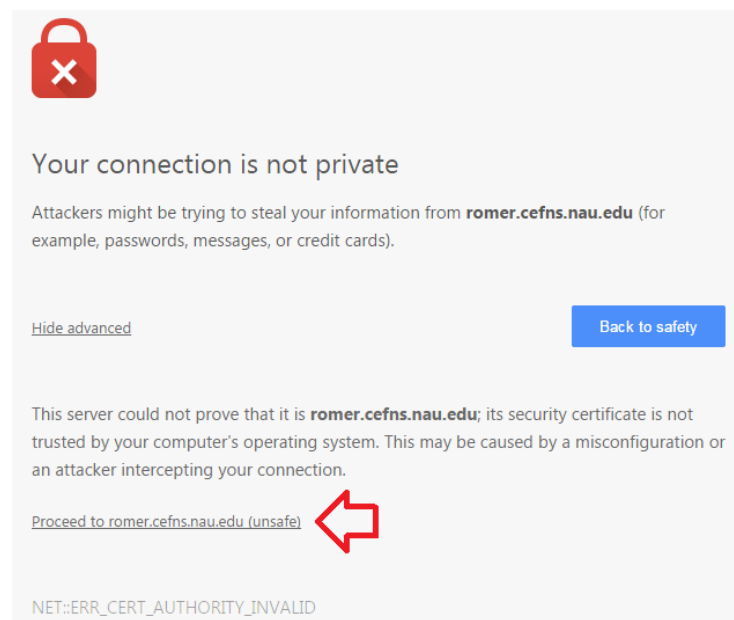
SEGA Web Portal Quick-Start Guide

Getting started

Using Google Chrome or Mozilla Firefox, navigate to romer.cefns.nau.edu. Other web browsers should work as well, but development was undertaken specifically to work well in Chrome or Firefox. Because the web portal is using a self-signed certificate to deliver secure data, Chrome and Firefox both generate warnings when you first navigate to the page. This will be changed soon, but for the meantime there is nothing to worry about. To proceed to the site:

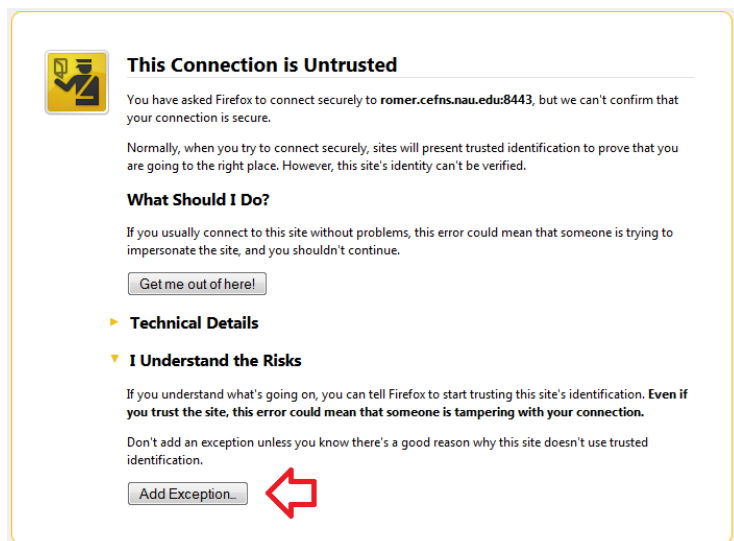
Chrome

Click 'Advanced' and select 'Proceed to romer.cefns.nau.edu (unsafe)'

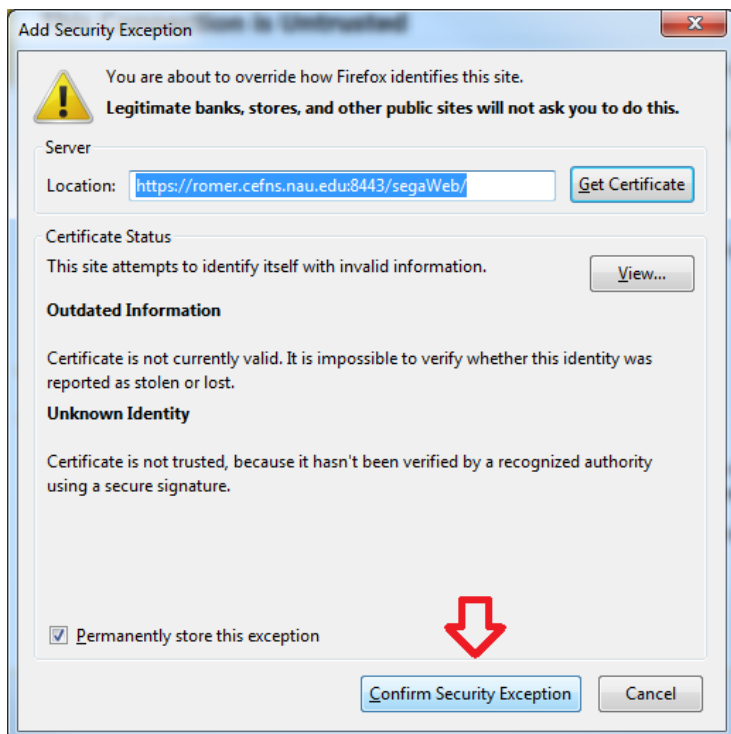


Firefox

Expand 'I Understand the Risks' and click 'Add Exception'



Now choose 'Confirm Security Exception'



Navigating the Web Portal

You should now see a screen like the one pictured below. You *do not* need to log in to test the system.



The home navigation button will bring you back to this page. For the rest of this document we are only going to focus on the ‘data’ link located at the top of the page. Clicking this link brings you to a page that appears like the one shown below.



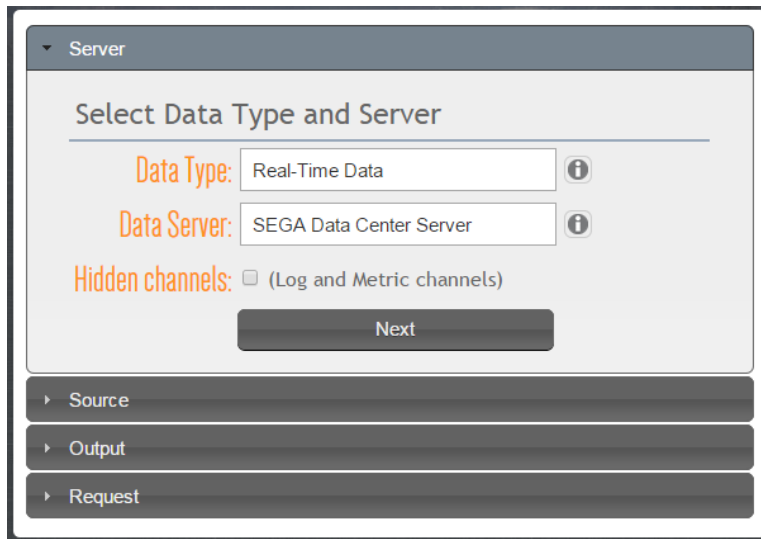
Viewing data on the web portal

Clicking the ‘data’ link brings you to a landing page that allows you to make a request to view or download data of interest. Each drop-down menu allows you to select a particular request attribute that is used in the final request to fetch the data of interest. Each menu also has an icon next to it that, when clicked, will provide information about that particular menu.

The Server Tab

The first menu is the general type of data you wish to select. Currently, archived (database) modes are unavailable and we will be only looking at real-time data. The second menu provides an option for which server to fetch data from. For this guide, we will choose 'SEGA Data Center Server'.

Before clicking 'Next', the menus should look like this:



The screenshot shows a web interface for the 'Server' tab. At the top, there's a dropdown menu labeled 'Server'. Below it, the title 'Select Data Type and Server' is displayed. The interface contains three main input fields: 'Data Type' with a dropdown menu showing 'Real-Time Data', 'Data Server' with a dropdown menu showing 'SEGA Data Center Server', and 'Hidden channels' with a checkbox labeled '(Log and Metric channels)'. Each of the first two fields has an information icon (i) to its right. Below these fields is a 'Next' button. At the bottom of the interface, there are three expandable sections: 'Source', 'Output', and 'Request', each with a right-pointing arrow.

The Source Tab

This menu allows you to choose the channels, or data streams, that you are interested in. There are two ways to filter the channels – first, you can select multiple source names from the 'Data Source' dropdown that will filter the results to include only those channels that come from the selected source.

Data Source Drop-Down Menu

For example, if you are interested in looking at data from the Flagstaff Arboretum, you might first filter the channel list by clicking the 'Data Source' drop-down menu and selecting 'arboretum_channelized'. You'll notice that at the bottom of the channel list it now says something like 'Showing 1 to 151 of 151 entries (of 343 total)'. Also notice that if you click the 'Data Source' drop-down menu again, 'arboretum_channelized' should be selected. You can select multiple sources to filter at a time, or you can click an already selected source again to remove it from the filter list.

We suggest you start with channels from the Arboretum Weather Station's datalogger such as 'cr1000/Hourly/AirTC_Avg', 'cr1000/Hourly/Geonor_precip_mm' or 'cr1000/Hourly/RH'. In the production version, these names will be replaced with more user-friendly versions. There are also many channels associated with WiSARD sensing devices and sensors connected to WiSARDS (e.g. wisard_2/mod_0/stream_2) that will also have user-friendly names in the production version.

Search Bar

Another way to filter the channel list is to use the search bar located at the top-right section of the channel list. The search bar begins filtering the list as you type. For example, if you are interested in soil temperature data, you might begin by typing 'soil' in the search bar.

Selecting Channels

Channels are selected by clicking the checkbox or anywhere along the row of the channel of interest. When selected, the checkbox is checked and the entire row appears highlighted.

Note: Selecting a channel and then using a filter that hides that channel from the list doesn't mean that the channel is deselected just that it is no longer being displayed in the menu.

In the following screen shot, I started by choosing 'arboretum_channelized' from the 'Data Source' filter menu and then typed 'thirty' in the search bar. This resulted in 23 channels that contain thirty minute averages of the data. I've selected 'AirTC_Avg' and 'PAR_Tot_tot' to view the data from a temperature and light sensor at the Flagstaff Arboretum.

The screenshot shows a web interface for selecting channels. At the top, there are tabs for 'Server', 'Source', 'Output', and 'Request'. The 'Source' tab is active. Below it, the title 'Select Channels' is displayed. A filter section shows 'Filter results by:' with 'Data Source' set to 'Source Name' and a search bar containing 'thirty'. Below this is a table of channels. The table has three columns: 'Source Name', 'Channel Name', and 'Data Type'. The 'Source Name' column is filtered to 'arboretum_channelized'. The 'Channel Name' column lists various channels, and the 'Data Type' column shows 'experiment_data' for all. Two channels are selected: 'cr1000/Thirty/AirTC_Avg' and 'cr1000/Thirty/PAR_Tot_Tot'. Below the table, it says 'Showing 1 to 23 of 23 entries (of 343 total)'. There are 'Previous' and 'Next' buttons at the bottom of the table area.

Source Name	Channel Name	Data Type
<input checked="" type="checkbox"/>	cr1000/Thirty/AirTC_Avg	experiment_data
<input type="checkbox"/>	cr1000/Thirty/BattV_Min	experiment_data
<input checked="" type="checkbox"/>	cr1000/Thirty/Geonor_HZ	experiment_data
<input type="checkbox"/>	cr1000/Thirty/Geonor_precip_mm	experiment_data
<input checked="" type="checkbox"/>	cr1000/Thirty/PAR_Den_Avg	experiment_data
<input checked="" type="checkbox"/>	cr1000/Thirty/PAR_Tot_Tot	experiment_data
<input checked="" type="checkbox"/>	cr1000/Thirty/PTemp_C_Avg	experiment_data
<input type="checkbox"/>	cr1000/Thirty/Precip_30min_mm	experiment_data
<input checked="" type="checkbox"/>	cr1000/Thirty/RH	experiment_data
<input type="checkbox"/>	cr1000/Thirty/RainCS_mm_Tot	experiment_data
<input checked="" type="checkbox"/>	cr1000/Thirty/SlrKW_Avg	experiment_data
<input type="checkbox"/>	cr1000/Thirty/Snow_Depth	experiment_data
<input checked="" type="checkbox"/>	cr1000/Thirty/SoilT_10_Avg	experiment_data
<input type="checkbox"/>	cr1000/Thirty/SoilT_45_Avg	experiment_data

The Output Tab

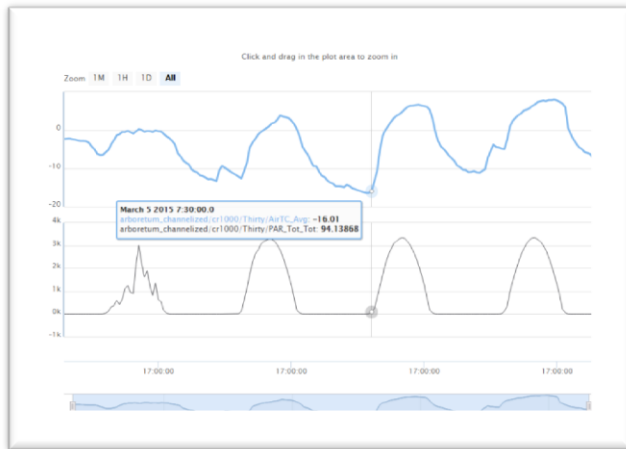
The next tab allows you select both the format in which you'll view or download the data as well as the interval for the data of interest. There will be several subsections below that detail each of the options of this particular tab.

Selecting an output type

The 'Output Type' drop-down menu lets you choose the way in which you'd like to see the data for the channels you selected in the previous tab.

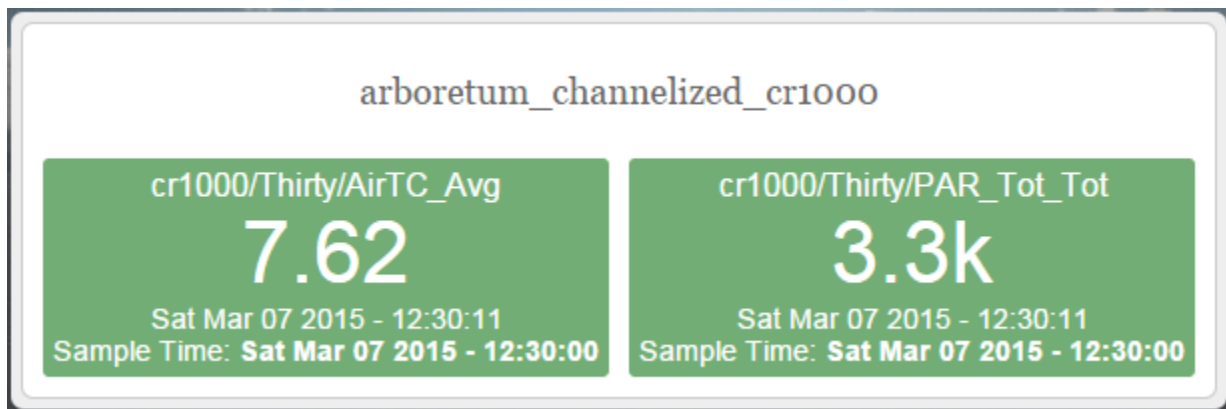
Plotting Utility

The first option is 'Plotting Utility' which will display a plot of the data in your browser without the need to download any files. An example of the plotting utility output is shown below.



Dashboard Style

This option displays only the most recent data point for each of the selected channel. Selecting 'Dashboard' lets you quickly view the current or last-known state of a group of channels. Using the previous example results in the following:



Download as CSV

This option fetches the data as requested and returns a CSV file to the user. The CSV file provides header information about the request as well as extra columns that contain the timestamp strings of the sample data point to make it easier to quickly realize when a sample was taken. The RBNB (ring-buffered network bus) timestamp is the point at which the data was last collected by the cyber-infrastructure. The sample timestamp is the point at which the actual measurement was taken. Both timestamps appear as milliseconds since 1970. To convert this value to Excel datetime, use the following formula:

$$= \frac{CELL}{60 * 60 * 24 * 1000} + "1/1/1970"$$

Note: If opening the CSV in Excel be aware that certain versions of Excel will overwrite or trim the timestamp values unless the column display value is changed from 'General' to 'Number' before saving.

Updating data in real-time

Both dashboard and plotting utility allow the user to select the option to update in real-time. Checking the 'Update data in Real-Time' option will send a request to the server every second and ask for any new data. If there is new data for any of the channels, the browser will automatically update and the display the new data points.

Selecting an Interval

The interval menu allows a user to choose the range over which the data to look for data. The first option 'Date Range' shows a calendar that by default displays the beginning and ending date of the data available. The range can be modified by clicking the 'From' or 'to' menu and choosing a new start or end date. The other tab 'Time Interval' allows data to be selected by a relative time stamp. Choosing 'Current Time' on the 'Relative to' menu means that the request will be made starting at the time of the request and looking back the chosen time interval. 'Recent Data Point' starts its request beginning at the time of the last known data point for each channel and looking back over the selected time interval.

To continue the example from before, I will choose to plot my data from my two channels over a 4 day period at the end of February. My output tab will then look like this:

Server

Source

Output

Choose Output Format

Output Type: Plotting Utility

Update data in Real-Time: ☐ (Option is available)

Date Range Time Interval

Select Data By Date Range

From 02/25/2015 to 02/28/2015

Previous Next

Request

The Request Tab

The final tab just summarizes the request and allows you to review all of your selections. For my previous example, my request tab looks like this:

Server
Source
Output
Request

Review and Submit Request

Note: If you are logged in you can save this request to your user page.

Data Source: Real-Time Data

Source Server: SEGA Data Center Server

Source Address: romer.cefns.nau.edu:3333

Selected Channels: arboretum_channelized/cr1000/Thirty/AirTC_Avg
arboretum_channelized/cr1000/Thirty/PAR_Tot_Tot

Data Range Format: Date Range

Start Date: Wed Feb 25 00:00:00 MST 2015

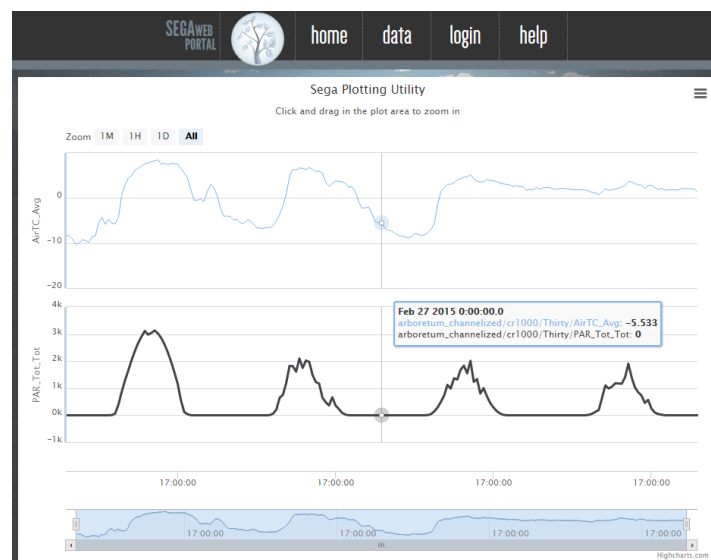
End Date: Sat Feb 28 23:59:59 MST 2015

Output Format: Plotting Utility

Update Data in Real-Time: False

Previous
Submit

Clicking submit will send all of the request parameters to the server and the data will now actually be fetched in the form chosen in the 'Output' tab. My request plots four days of data at a thirty minute sample resolution for 4 days at the end of February and looks like this:



Conclusion

This is the end of the quick-start guide as its purpose is only to get you started using the web portal. The 'help' section of the website is currently being built and will include this guide as well as much more detailed descriptions of what each option is throughout the web portal as well as how to use the protected log-in based portion of the site.

Note: If you are receiving a “data request too large” error, try selecting a lower-resolution (e.g. Thirty instead of OneMin) channel or either a smaller interval or less channels. This error is only generated when output style is set to ‘Plotting Utility’. The same request can be made to the other output types and will complete without generating the error.