



# Utility Usage Monitor Manual

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## **Introduction**

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Welcome to the Utility Usage Monitor application for the INTEG JNIOR. It is designed to help you monitor your utility meters (gas, water, electric, steam, biogas, etc.) or any other meter and report your totalized consumption on a configurable minute, hourly, daily, weekly, monthly and yearly basis and also chart your instantaneous flow.

## **Hardware Connections**

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The Utility Usage Monitor application requires, at a minimum, 1 pulsed signal connected to one digital input on the JNIOR that represents a totalized pulse of x amount of the utility (gas, electric, etc.) where x is determined by the meter configuration. The pulses are counted on the JNIOR to sum the flow (pulse counts) on an hourly basis. An **optional** analog signal representing the instantaneous flow can be connected to an analog expansion module. The Utility Usage Monitor application can handle up to eight (8) meters (one pulsed signal and one instantaneous flow per meter).

The user can connect the totalized pulse signal to any one of the digital inputs. The instantaneous flow must be connected to the corresponding analog signal number. For example, if the totalized count signal is connected to digital input 3, then the instantaneous flow signal must be connected to analog input 3. If the totalized count signal is connected to digital input 7, then the instantaneous flow signal must be connected to analog input 7 (which is analog input 3 on the “second” analog expansion module). By going to the main JNIOR web page and then the I/O Control/External tab, you can see the “number” assigned to each analog input.

## Signal Debounce

One consideration that must be made when configuring the JNIO is if the JNIO debounce timer must be modified for the digital input. Debounce is the amount of time that must pass before another input pulse can be counted. This is needed because when a signal is activated, especially a contact closure from a relay, it can bounce and indicate additional false signals. Setting a debounce timer will limit the number of pulses to be counted. Additional pulses (or contact bounces) before the debounce timer expires will not be counted. The debounce value is set via the Main JNIO Web Page (see below). The default setting is 200 milliseconds which limits the number of pulses to a maximum of 5 per second. If your pulses will come faster, you must lower this value. Setting it to zero (0) removes the software debounce timer. The valid values are 0 to 255 milliseconds.

The screenshot shows the 'Configuration' tab of the JNIO web interface. The 'Input Channel Configuration' table is displayed with the following data:

Channel	Invert	Debounce (ms)	Latch			Conditioning	Alarm	
			Enabled	State	LatchTime (secs)		Enable	In
1	<input type="checkbox"/>	200	<input type="checkbox"/>	ON ▼	0	Normal ▼	<input type="checkbox"/>	
2	<input type="checkbox"/>	200	<input type="checkbox"/>	ON ▼	0	Normal ▼	<input type="checkbox"/>	
3	<input type="checkbox"/>	200	<input type="checkbox"/>	ON ▼	0	Normal ▼	<input type="checkbox"/>	
4	<input type="checkbox"/>	200	<input type="checkbox"/>	ON ▼	0	Normal ▼	<input type="checkbox"/>	
5	<input type="checkbox"/>	200	<input type="checkbox"/>	ON ▼	0	Normal ▼	<input type="checkbox"/>	
6	<input type="checkbox"/>	200	<input type="checkbox"/>	ON ▼	0	Normal ▼	<input type="checkbox"/>	
7	<input type="checkbox"/>	200	<input type="checkbox"/>	ON ▼	0	Normal ▼	<input type="checkbox"/>	
8	<input type="checkbox"/>	200	<input type="checkbox"/>	ON ▼	0	Normal ▼	<input type="checkbox"/>	

The 'Debounce (ms)' column is circled in red in the original image. A 'View Block Diagram' link is visible at the bottom right of the table area.

## Instantaneous Flow Settings

The following configuration items are set via the chart options button at the top right of the utilities page.

**Y- Axis Scaling** on the Instantaneous Flow Chart. The Minimum and Maximum values entered for the analog input via the Main JNIOR Web Page become the minimum and maximum values for the y-axis on the Instantaneous Flow Chart.

Chart Options ×

**Y-Axis** clear

Min:

Max:

**Targets** clear

High:

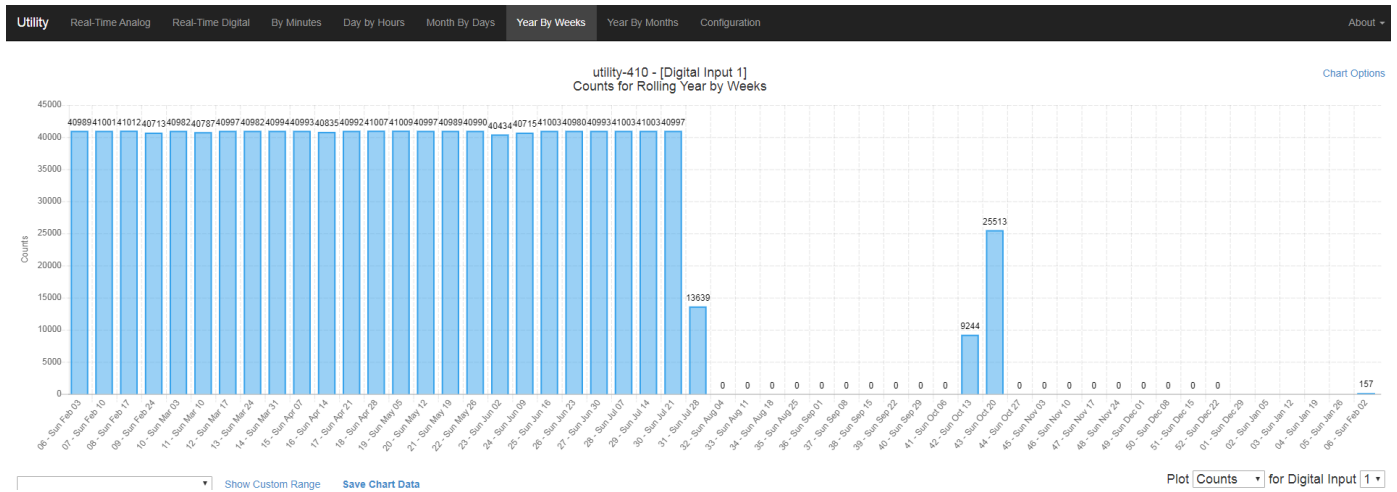
Low:

Cancel Save

**Targets** Displayed at the bottom of the Charts – read from the analog input Units configuration for the specific analog input.

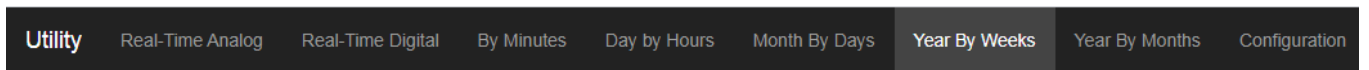
## Utility Web Screen

The web screen brings a user friendly aspect to the application. On the web page there is a drop down along the bottom of the charts that allows you to switch to a different input signal or values of data.



## Utility Usage Monitor Charts

The Utility Usage Monitor web screen is designed to give you both current and historical information about your utility consumption. At the top of the web page, you can look at the tabs and see the different chart based of the time spans, going from minutes, hours, days in the month, weeks in the year, and months in the year. When one of these tabs is selected by clicking on it, the associated chart will be displayed in the main area on the screen. On the chart, you can alter some of the displayable information, ranging from the value type in the chart, the input being monitored, and the time span of the information being displayed.



## Real - Time Analog

The real time analog chart shows the values being triggered on a 10 volt or 4-20 external module, and you can change which analog input you are looking at the bottom right.



## Real - Time Digital

The real time digital chart shows the data of the last ten digital inputs triggered on the JNIOR, giving all the values of the specified input channel.

utility-410 - [Digital Input 1]  
Counts for Real-Time Digital

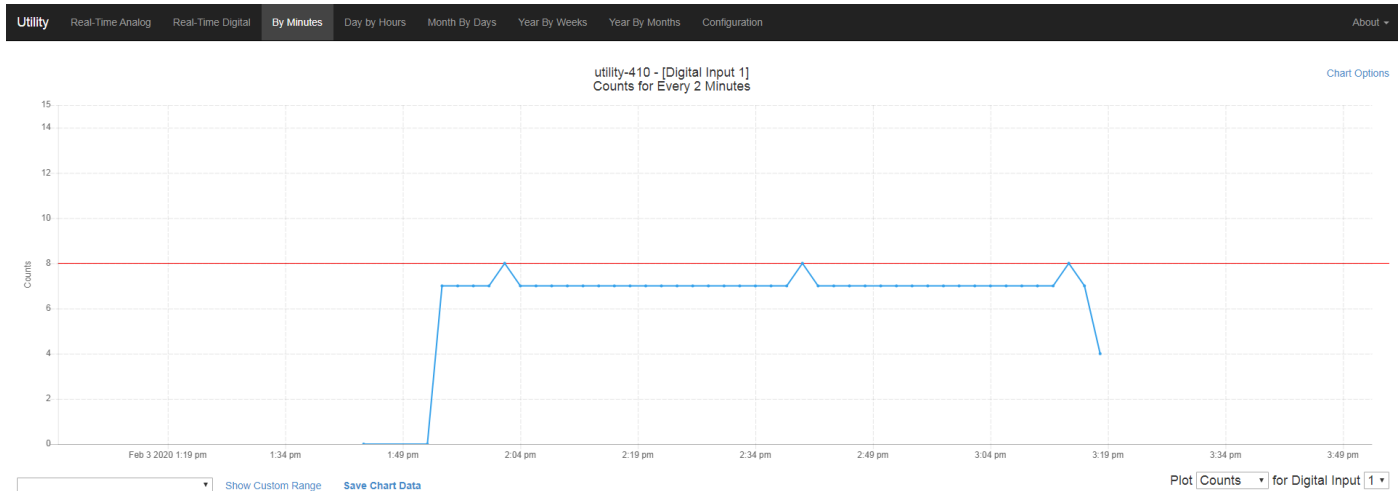
Cycle Start	Cycle End	Cycle Time	High Time	Low Time
02/04/2020 9:40:45.89 am	9:41:02.37 am	16.48s	5.00s	11.48s
02/04/2020 9:41:02.37 am	9:41:20.53 am	18.16s	5.00s	13.17s
02/04/2020 9:41:20.53 am	9:41:38.17 am	17.64s	5.00s	12.64s
02/04/2020 9:41:38.17 am	9:41:54.01 am	15.84s	5.00s	10.85s
02/04/2020 9:41:54.01 am	9:42:11.98 am	17.97s	5.00s	12.97s
02/04/2020 9:42:11.98 am	9:42:27.80 am	15.82s	5.00s	10.82s
02/04/2020 9:42:27.80 am	9:42:46.59 am	18.79s	5.00s	13.79s
02/04/2020 9:42:46.59 am	9:43:01.99 am	15.40s	5.00s	10.40s
02/04/2020 9:43:01.99 am	9:43:20.05 am	18.06s	5.00s	13.06s
02/04/2020 9:43:20.05 am	9:43:38.49 am	18.44s	5.00s	13.45s
<b>Average over last 10 records</b>		<b>17.26s</b>	<b>5.00s</b>	<b>12.26s</b>



## By Minutes Chart

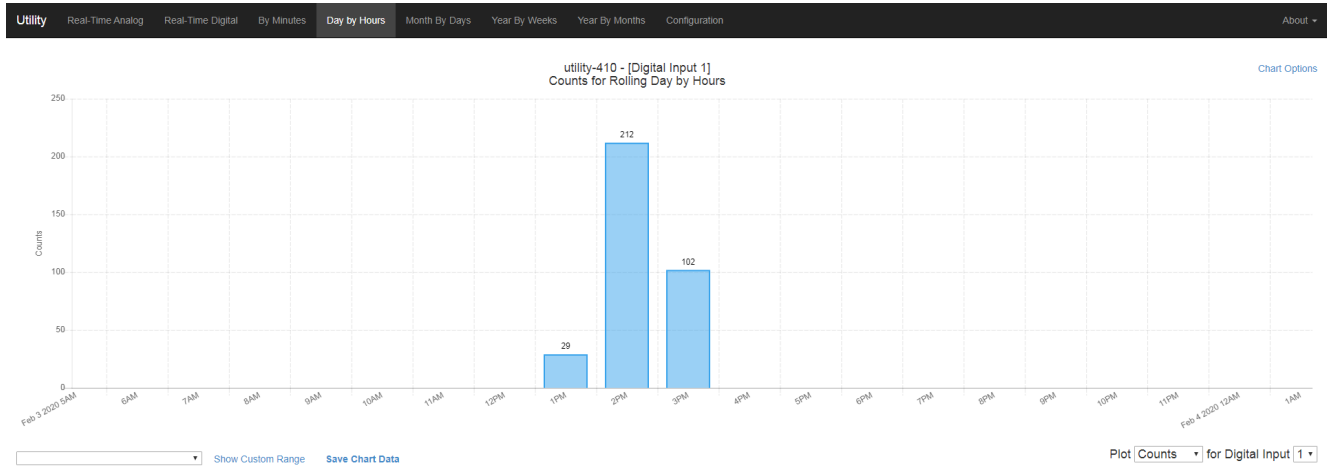
The By Minute Chart displays the totalized count in (x) minute intervals, where (x) can be either 1,2,3,4,5,6,10,12,15, or 30 minutes **for the last 4 hours**. The minutes time frame can be set in the configuration tab. The vertical axis scaling (Y-axis) is automatically calculated for display purposes. If you ‘mouse over’ any specific column, it will display the start time for the (x) minute interval and the actual amount recorded for that period. You can use the scroll wheel to zoom in and out of the chart.

**NOTE:** The (x) minute data is stored in battery backed memory in the JNIOR and is not stored in a file. However, you can save this data to a file by clicking on the SAVE button in the lower right corner of the web page. The SAVE function is described later in this manual.



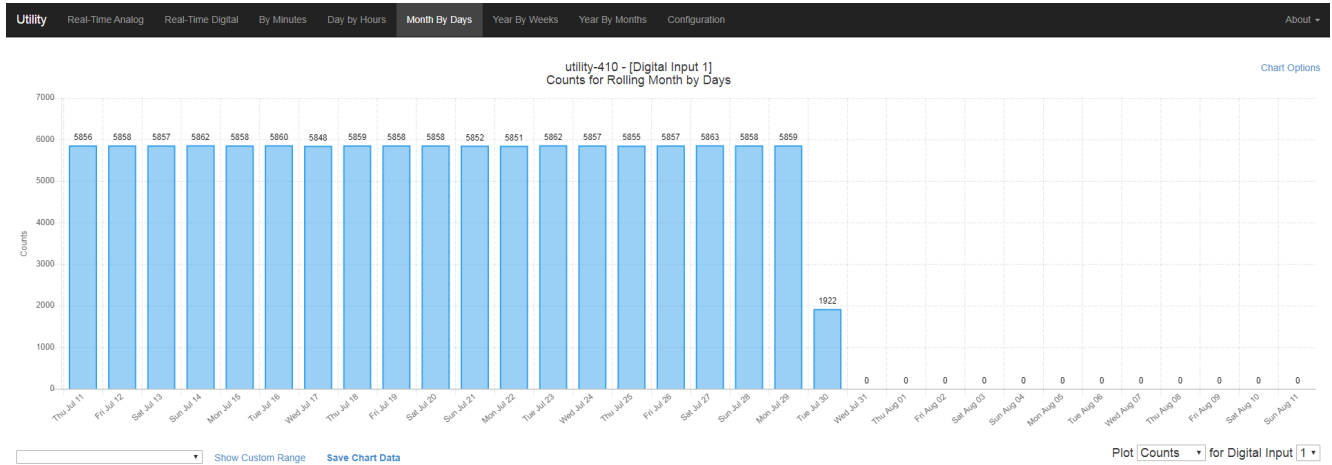
## Day by Hours Chart

The hourly chart displays the rolling 24 hour period for the totalized count. The vertical axis scaling (Y-axis) is automatically calculated for display purposes. If you ‘mouse over’ any specific column, it will display the hour and the actual amount recorded for that period. You can use the scroll wheel to zoom in and out of the chart.



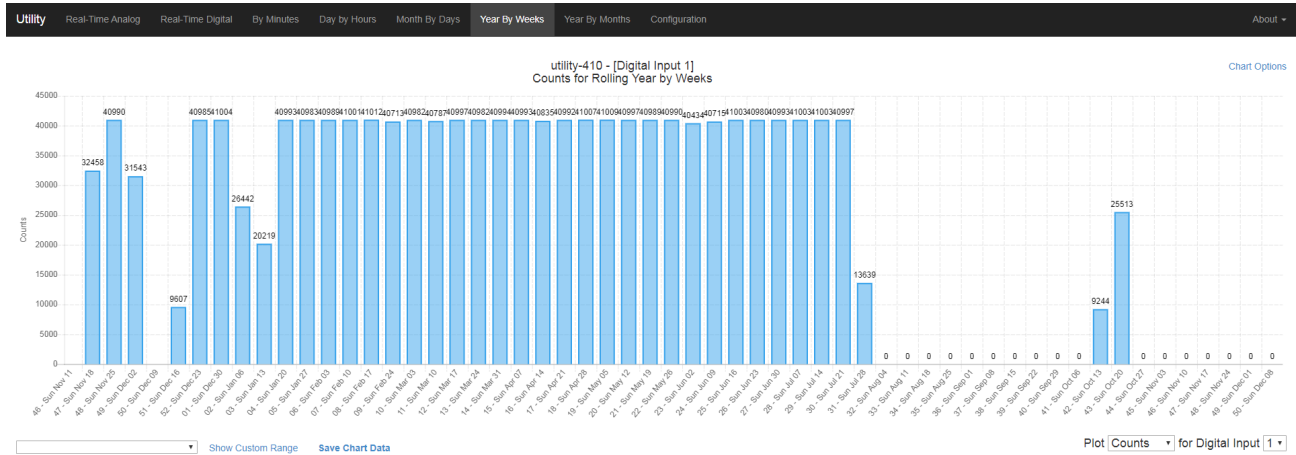
## Month by Days Chart

The weekly chart displays the rolling 30 day period for the totalized count. The vertical axis scaling (Y-axis) is automatically calculated for display purposes. If you ‘mouse over’ any specific column, it will display the date and the actual amount recorded for that period. You can use the scroll wheel to zoom in and out of the chart.



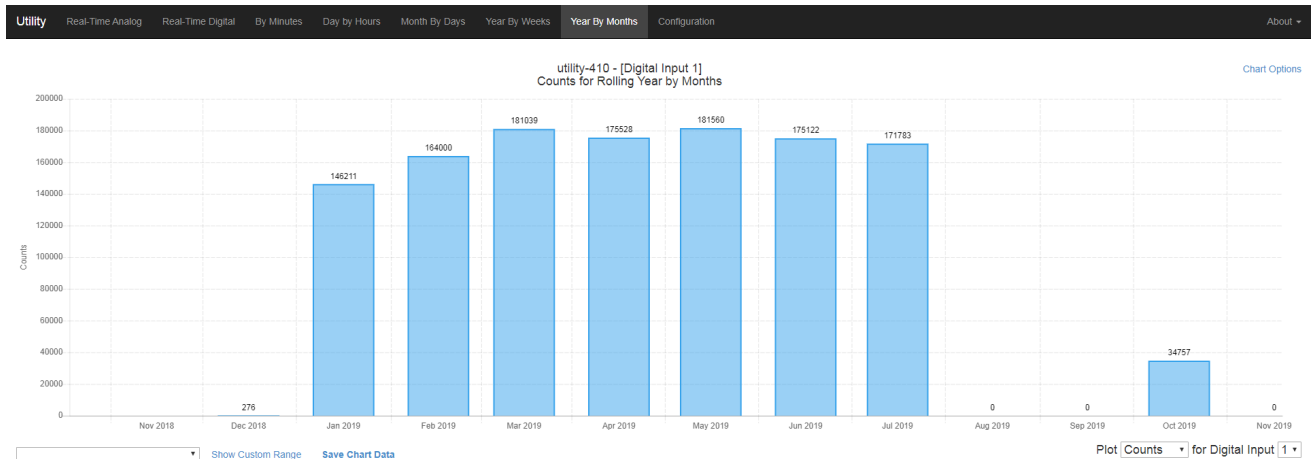
## Year by Weeks Chart

The yearly chart displays the 52 week period for the current year for the totalized count. The vertical axis scaling (Y-axis) is automatically calculated for display purposes. If you ‘mouse over’ any specific column, it will display the date and the actual amount recorded for that period. You can use the scroll wheel to zoom in and out of the chart.



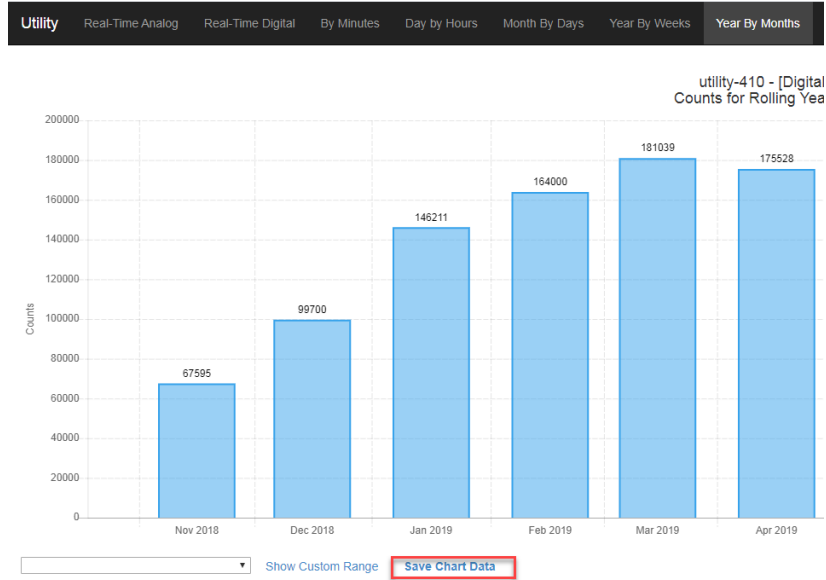
## Year by Months Chart

The yearly chart displays the 12 month period for the current year for the totalized count. The multiplier at the top (x 10000 on the chart below) is automatically calculated for display purposes and is the amount to multiply for the y-axis. If you ‘mouse over’ any specific column, it will display the week number and the actual amount recorded for that period.

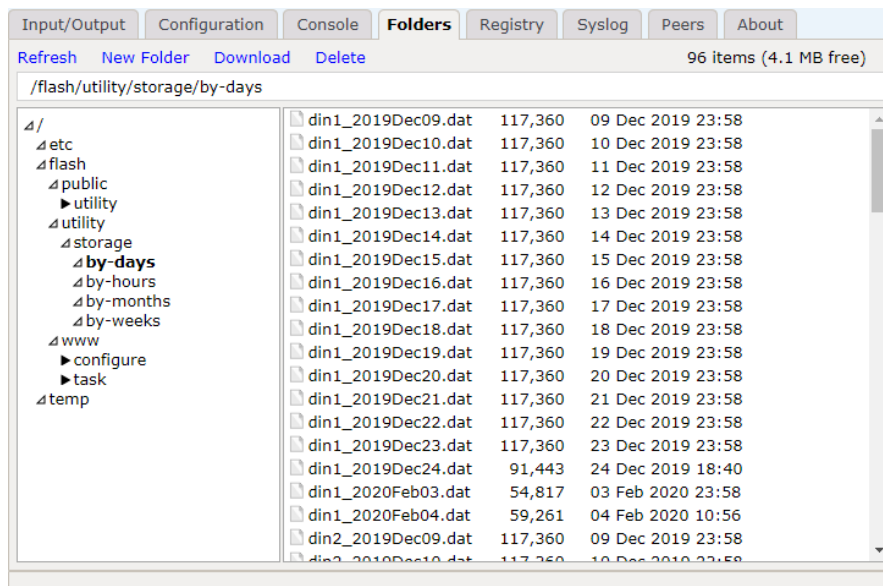


## Saving Your Data via the Web Page

When you are viewing the Utility web page, you can save the data displayed in the various charts by clicking on the SAVE button in the lower middle of the Utility web page.



The data for each graph will be saved in .dat formatted files on the JNIOR as shown below. These files will be viewable in a local web page that will display on a single chart the values you opened.



At the bottom of Utility web page is a “Save Chart” button. When you click on the Save button, the data currently loaded in the web page will be saved to your PC as CSV files. This includes the milliseconds, datestamp, and counts. This feature is described later in this manual.

## Configuration Tab

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The configuration tab lets you change all the display settings on the utility application. The first section lets you control which charts you can view in the utility application. If unselected, that chart will no longer be viewable until re-checked.

### Configuration

#### Visible Tabs

- Real-Time Analog?
- Real-Time Digital?
- By Minutes?
- Day by Hours?
- Month by Days?
- Year by Weeks?
- Year by Months?

The next next set of configuration is an assortment of options, one letting you pick which chart is open when the application starts, another letting you set which input the graph is grabbing data from, the next allowing to set how many rows are in each table, and the last allowing you to set how many minutes the By Minutes chart has in its time span.

The initial Chart is

The initial Input is

The real-time table should show  rows

The Minute Chart chart should show values in  minute blocks

After those options is what values are available to view for each input, the values being Counts, Average Cycle Time, Average High Time, Average Low Time, and Available Percentage. You can also set the multiplier for each value, and also set which value defaults on the chart for each

input. Lastly, you can also set which analog outputs you can set at the bottom of the configuration page can be set in the analog preset chart.

Input #	Counts	Multiplier	Avg Cycle Time	Avg High Time	Avg Low Time	Available Percentage	Default Metric
Input 1	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Counts
Input 2	<input checked="" type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Available Percentage
Input 3	<input checked="" type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Available Percentage
Input 4	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Available Percentage
Input 5	<input checked="" type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cycle Time
Input 6	<input checked="" type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	High Time
Input 7	<input checked="" type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Low Time
Input 8	<input checked="" type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Available Percentage

Select the Analog Inputs to be Logged

- Real-Time Flow Analog Input 1
- Real-Time Flow Analog Input 2
- Real-Time Flow Analog Input 3
- Real-Time Flow Analog Input 4

## Summary

Thank you for purchasing the **JNIOR**. Hopefully this manual made the getting-to-know process of your new **JNIOR** very quick and easy. The **JNIOR** has many more wonderful tools and features available, and are explained in detail in the supplied documents.

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