User Manual

Automatic Weather Station and Weather Information System for Tea Grown Area

Arthur C Clarke Institute,
Katubedda,
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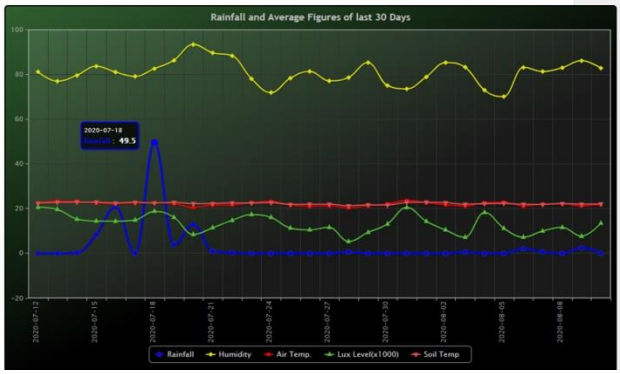
Sri Lanka.

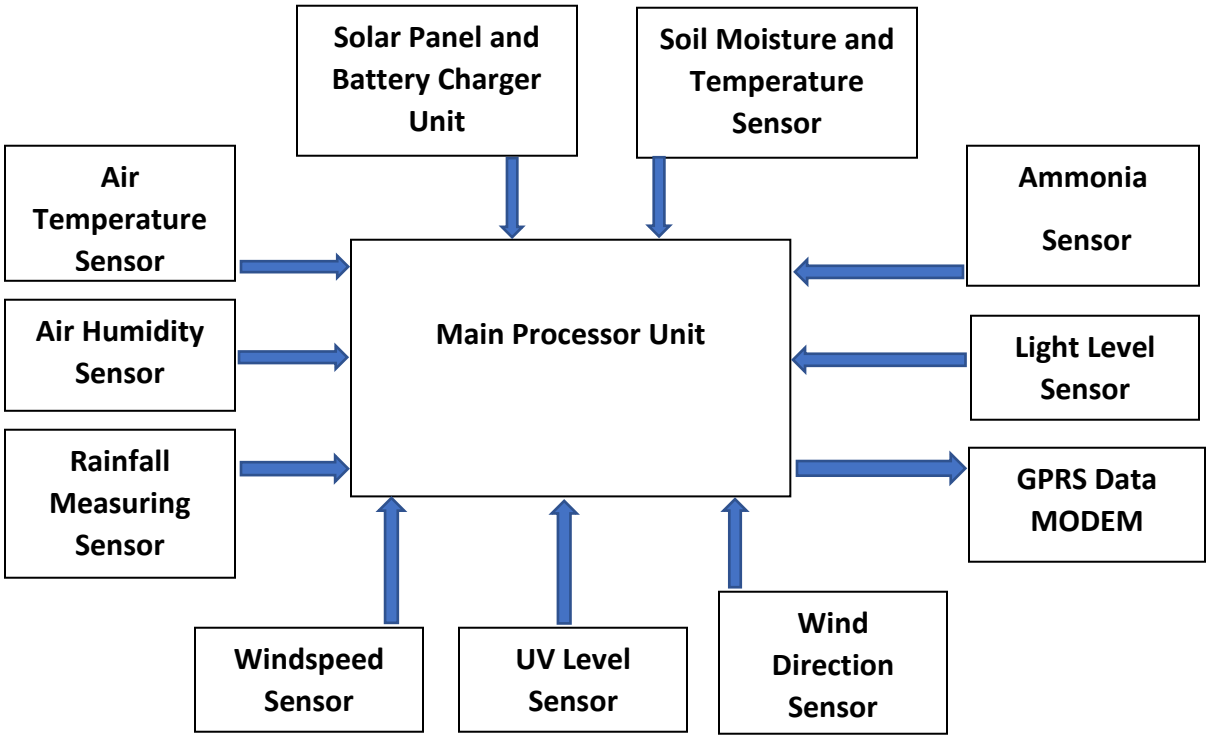
Please Note: Rainfall is cumulated from midnight

Center	Date Recorded	Time Recorded	Air Temp (°C)	Humidity (%)	Wind Direction (0°-359°)	Wind Speed (km/h)	Gust Speed (km/h)	Rainfall (mm)	UV Level (µw/sq.cm)	Light Level (Lux)	Soil Moisture_A (%)	Soil Temp.A (°C)	Soil Moisture_B (%)	Soil Temp.B (°C)	Ammonia Level (%)
TRI-PS	2020-08-11	10:23:44	24.60	78	23	8.1	12.1	0.0	801	24,280	99.9	23.6	99.9	22.2	16
TRI-KT	2020-08-11	10:22:45	29.40	81	97	2.5	4.0	0.6	2,159	86,530	99.9	23.9	75.1	23.9	99
LIDS	2020-08-11	10:22:07	22.20	74	286	0.0	0.0	0.0	939	35,515	99.9	18.5	99.9	18.2	52
TRI-TW	2020-08-11	10:19:53	20.40	92	313	1.5	4.0	2.7	1,146	34,185	99.9	20.2	0.0	0.0	76
FET-BO	2020-08-11	10:19:44	17.90	99	323	6.1	12.1	3.3	469	17,341	99.9	18.0	99.9	16.5	63
UVA-HE	2020-08-11	10:19:27	26.10	65	120	1.0	4.0	0.0	2,969	95,794	99.9	20.8	99.9	21.9	31
TRI-PS	2020-08-11	10:18:44	25.30	76	264	0.0	0.0	0.0	800	24,196	99.9	23.6	99.9	22.2	17
TRI-KT	2020-08-11	10:17:45	29.40	82	98	3.0	4.0	0.6	1,000	43,415	99.9	23.9	75.1	23.9	100
LIDS	2020-08-11	10:17:08	23.10	72	258	0.0	0.0	0.0	741	33,161	99.9	18.5	99.9	18.2	52
TRI-TW	2020-08-11	10:15:10	20.20	92	285	1.5	4.0	2.7	1,818	53,513	99.9	20.0	0.0	0.0	76

Display Weather Station Data from TRI-Passara



System Diagram



Features

1) It can measure Wind speed, Wind direction, Humidity, Temperature, UV, Illuminance, Rainfall, Soil moisture, Soil Temperature and Ammonia level.

2) Solar powered standalone operation

3) Weather data automatically transferred to web server in 15min time interval via GPRS

4) 48Hours Battery backup time for low solar light condition.

5) Soil condition and Ammonia level measurement sensors can be fixed in the field 100m maximum away from the main unit.

6) Factory calibrated sensors and no need to manual calibration

7) The daily, weekly, monthly or yearly reports can be generated easily

Specifications (measurements)

Air Temperature range: -40～+60℃

Accuracy : +/- 1˚C, Resolution:0.1˚C

Air Humidity range:10%～99%

Accuracy : +/- 5%, Resolution: 1%

Rain volume: 0 - 9999 mm

Resolution:0.3mm (if rain volume < 1000mm), 1mm (if rain volume >=1000mm)

Accuracy : +/- 10%

Wind speed: 0-50m/s (0~100mph)

Accuracy: +/- 1m/s (wind speed< 5m/s), +/-10% (wind speed >=5m/s)

Wind direction: 0 to 359 degree

Light: 0-200k Lux

Accuracy : +/-15%

UVI: 0-15

Soil Moisture: 10%～99%

Accuracy : +/- 1%, Resolution: 0.1%

Soil Temperature range: -40～+60℃

Accuracy : +/- 1˚C, Resolution:0.1˚C

Ammonia Level : range: 1%～99%

Accuracy : +/- 1, Resolution: 1

Weather Information System for Tea Grown Area

The intention of this System is to develop an efficient and accurate system for Reporting Weather Information in Tea grown area.

The system is a web based Information System which can be accessed through the Internet. The link to access the system is https://awsdata.lk/ .

The following picture displays the home page of the system.

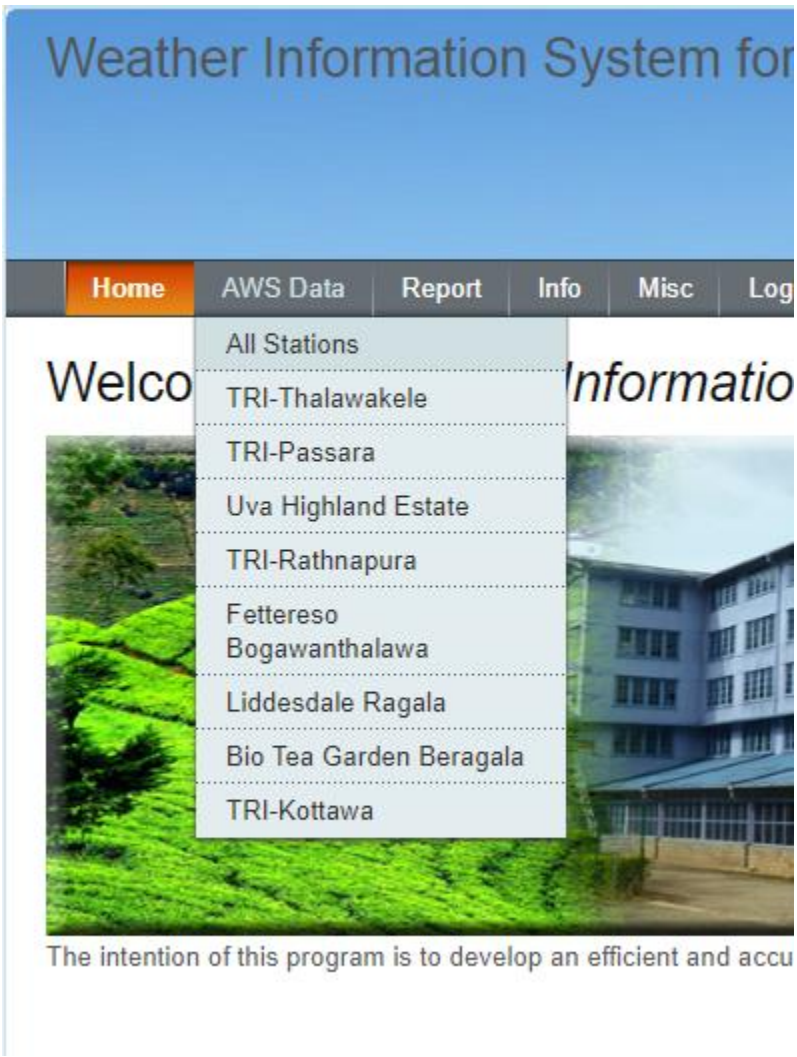
Pic. I – Home Page of the System

Automated Weather Station Data

The system collects data from eight automated weather stations in tea grown area. The collection of data consists of Humidity, Air Temperature, Rainfall, Lux Level, Soil Temperature, Soil Moisture, Win Speed etc. The system records a data set from each station at 15 minutes frequency. The rainfall is cumulated from midnight.

Access to Live Data Update

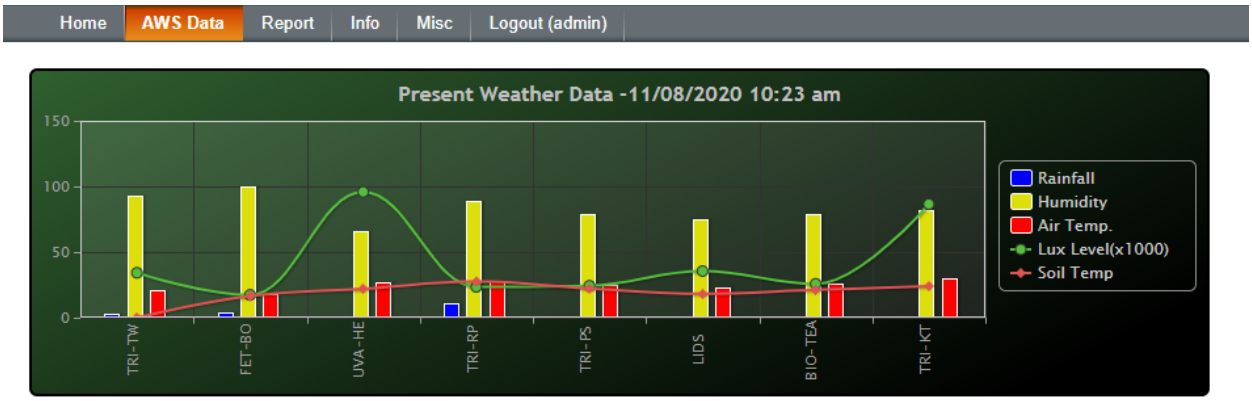
The Live Data of the system can be accessed by selecting “AWS Data” from the Main Menu. It will display data from a particular station or data from all stations.



Pic. II – AWS Data Menu

According to your selection, the system will display data from all stations or from one particular station. The data set will be automatically refreshed in every 05 minutes to display latest records, so nothing required to do for latest data set.

If you select “All Stations”, the following window will be displayed.



Please Note: Rainfall is cumulated from midnight

Center	Date Recorded	Time Recorded	Air Temp (°C)	Humidity (%)	Wind Direction (0°-359°)	Wind Speed (km/h)	Gust Speed (km/h)	Rainfall (mm)	UV Level (µw/sq.cm)	Light Level (Lux)	Soil Moisture_A (%)	Soil Temp.A (°C)	Soil Moisture_B (%)	Soil Temp.B (°C)	Ammonia Level (%)
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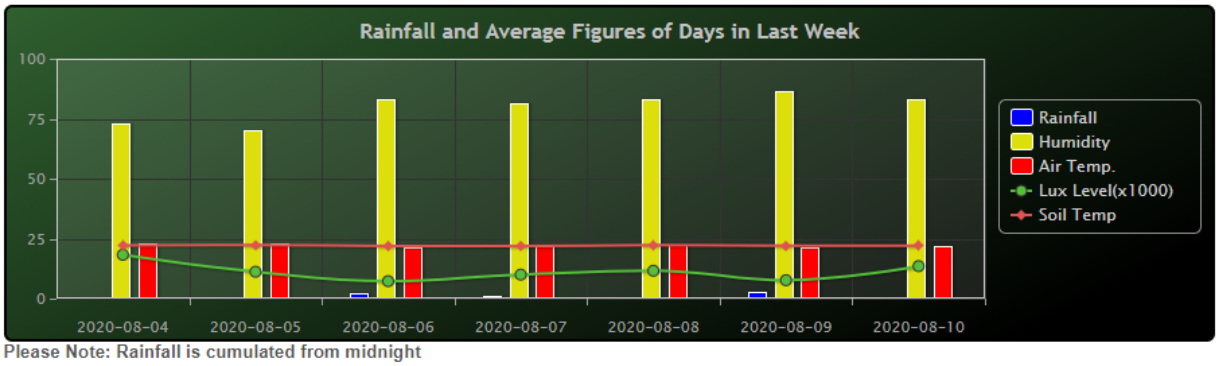
Pic. III – Data from All Stations

The Chart appeared just below the menu bar indicates the latest situation of all stations. If the chart is more complicated or you just need to concentrate on less weather parameters, you can temporarily remove chart items by just clicking on the legend of items appeared on the right side of the chart. The temporarily disappeared items will again display when you click on them again. When you move mouse pointer, a particular value relevant to chart item will be displayed.

The data grid will be displayed just under the chart. By clicking on “Next” , “Previous” or number buttons, you may traverse on the data set.

If you select Station Name from the “AWS Data” Menu, the following window will be displayed. As an example, this is what you see when you select “TRI-Passara” from “AWS Data” menu.

Display Weather Station Data from TRI-Passara



Please Note: Rainfall is cumulated from midnight

Center	Date Recorded	Time Recorded	Air Temp (°C)	Humidity (%)	Wind Direction (0°-359°)	Wind Speed (km/h)	Gust Speed (km/h)	Rainfall (mm)	UV Level (µw/sq.cm)	Light Level (Lux)	Soil Moisture_A (%)	Soil Temp.A (°C)	Soil Moisture_B (%)	Soil Temp.B (°C)	Ammonia Level (%)
TRI-PS	2020-08-11	10:33:44	24.1	82	69	0.0	0.0	0.0	1,094	31,468	99.9	23.8	99.9	22.3	16.0
TRI-PS	2020-08-11	10:28:44	24.1	81	329	0.0	0.0	0.0	350	13,244	99.9	23.7	99.9	22.3	16.0
TRI-PS	2020-08-11	10:23:44	24.6	78	23	8.1	12.1	0.0	801	24,280	99.9	23.6	99.9	22.2	16.0
TRI-PS	2020-08-11	10:18:44	25.3	76	264	0.0	0.0	0.0	800	24,196	99.9	23.6	99.9	22.2	17.0
TRI-PS	2020-08-11	10:13:44	25.8	73	49	2.0	8.1	0.0	702	23,132	99.9	23.5	99.9	22.1	17.0
TRI-PS	2020-08-11	10:08:44	26.5	70	148	0.0	0.0	0.0	1,207	38,184	99.9	23.5	99.9	22.1	16.0
TRI-PS	2020-08-11	10:03:44	26.5	71	122	2.5	4.0	0.0	1,071	32,284	99.9	23.4	99.9	22.1	16.0
TRI-PS	2020-08-11	09:58:44	26.9	65	41	0.0	0.0	0.0	2,455	83,000	99.9	23.3	99.9	22.0	16.0
TRI-PS	2020-08-11	09:53:44	28.0	65	29	2.0	4.0	0.0	2,337	78,692	99.9	23.3	99.9	22.0	16.0
TRI-PS	2020-08-11	09:48:44	27.5	66	204	0.0	0.0	0.0	2,165	73,208	99.9	23.2	99.9	22.0	17.0

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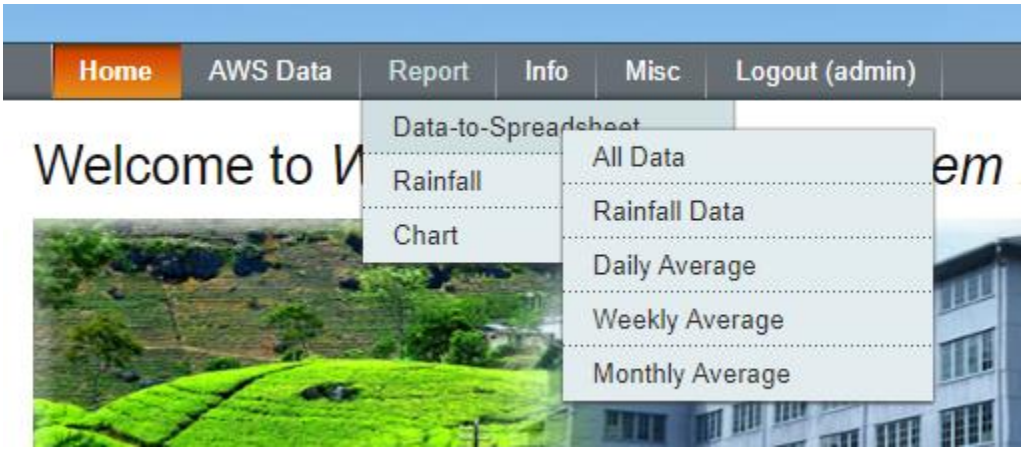
Pic. IV – Data from One Station

The chart displays rainfall and average figures of weather parameters of that station in the last week. As explained earlier, you may temporarily disable some chart items by clicking on relevant legend items displayed right corner of the chart.

The data set followed by the chart is relevant to that particular weather station (Center).

Reports

The reports are based on the data collected by the system through all stations. For research purposes, all the data will be available for users. You may request permissions for access data from “Tea Research Institute (TRI)”. Then you will be given “username” and “password” for accessing data.

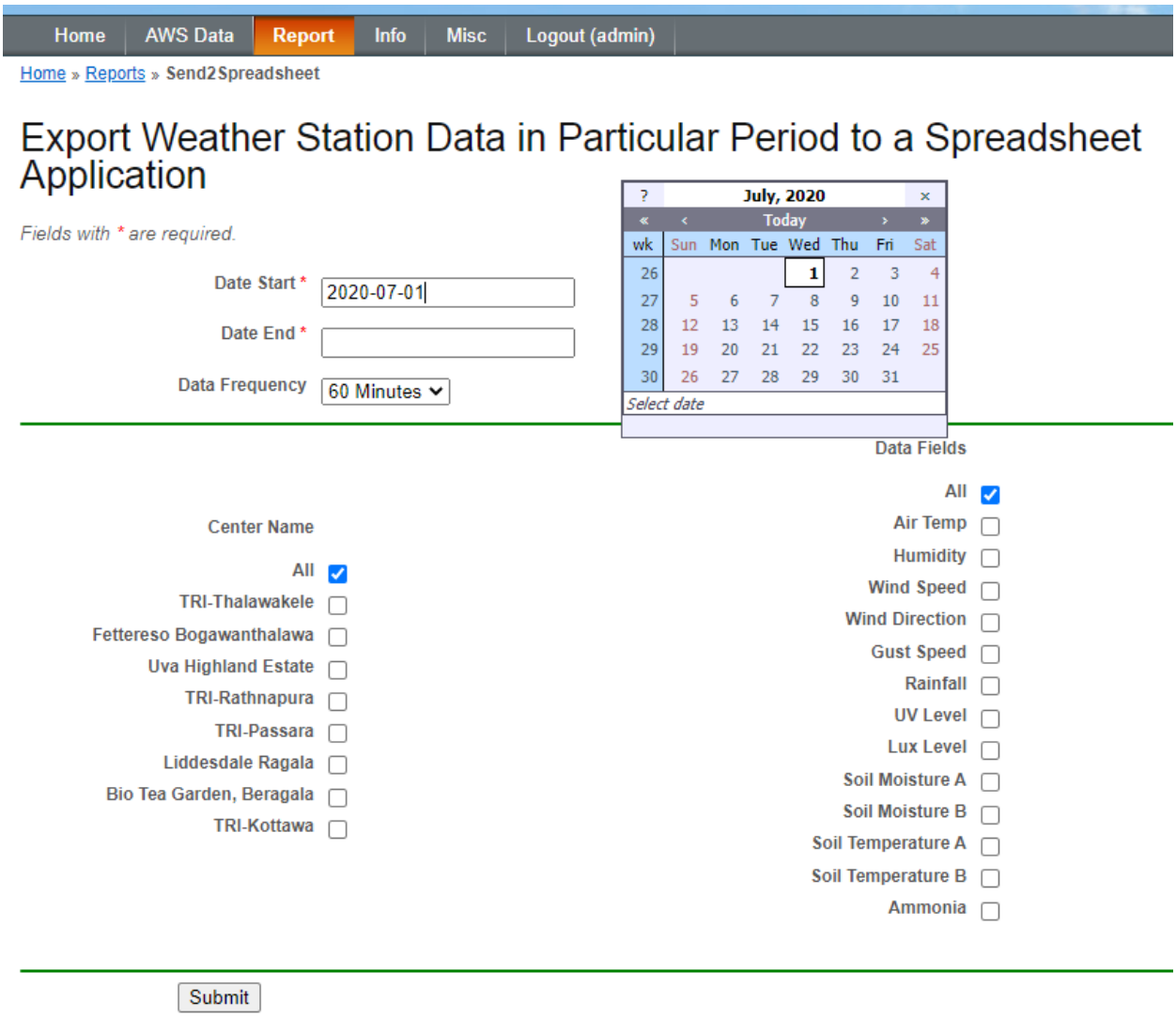


Pic. IV – Data to Spreadsheet

The weather station data can be exported to spreadsheet application for further analysis. You may select your option from five options available. Then you will be prompted to select date range and weather parameters you may need to download.

The following picture (Pic. V) describes the options you have to select for downloading data. The dates can be selected with the help of calendar or you may enter it with format of “yyyy-mm-dd”. For “All Data”, you may select data frequency you want, as system collect data at 15 minutes frequency but you may not need such a huge amount of data. Then you will select “30 Minutes” of “60 Minutes” data frequency to get comparatively less amount of data for analysis. If you want data collected from a particular station or a few of them, you may select those centers and may uncheck “All” by clicking on it. Following same, you may select data fields according to your requirements. Then the data filtered according to your requirements will be downloaded in spreadsheet format.

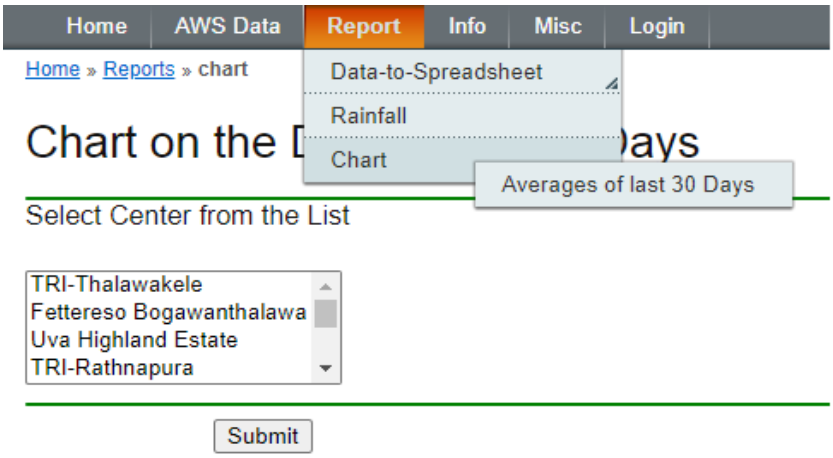
The other items under the “Data-to-Spreadsheet” menu follow the exact same interface described above.



Pic. V – “Data to Spreadsheet” Options

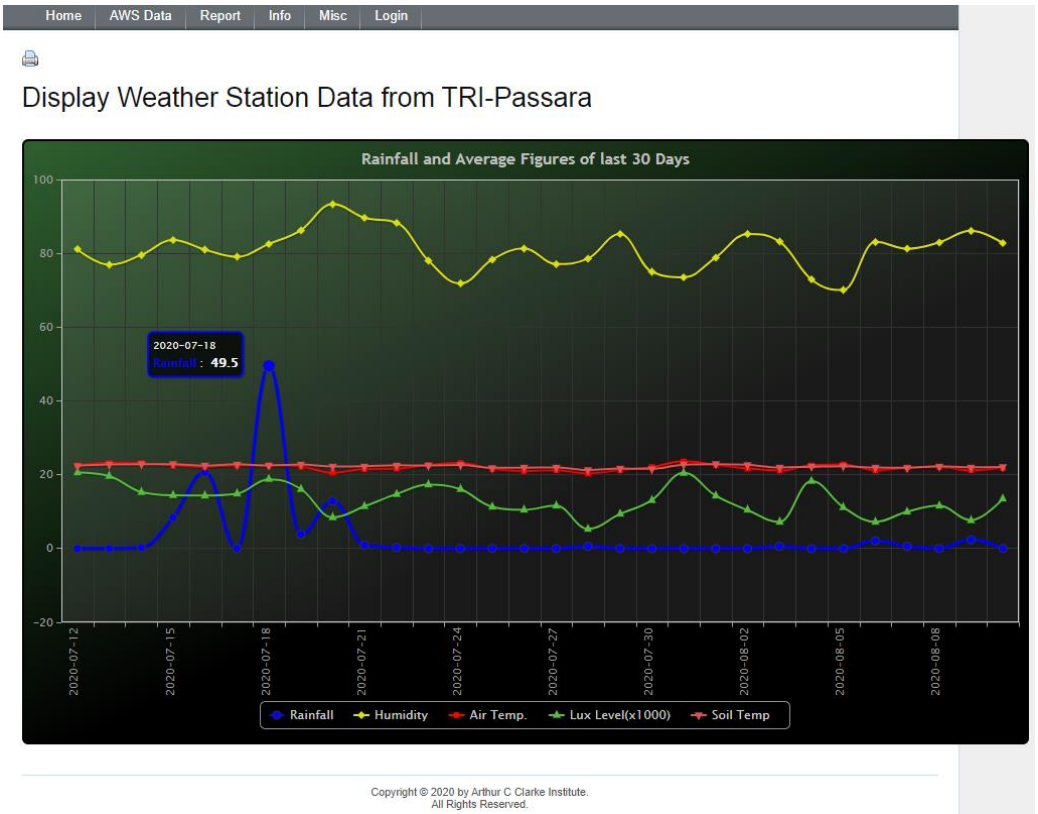
The “Rainfall” menu item under the “Report” menu will just display rainfall data of one or more stations in particular period. You may get a hard copy of these data by clicking on a “printer” icon of the top-left side of the interface.

Chart on the Data of last 30 Days



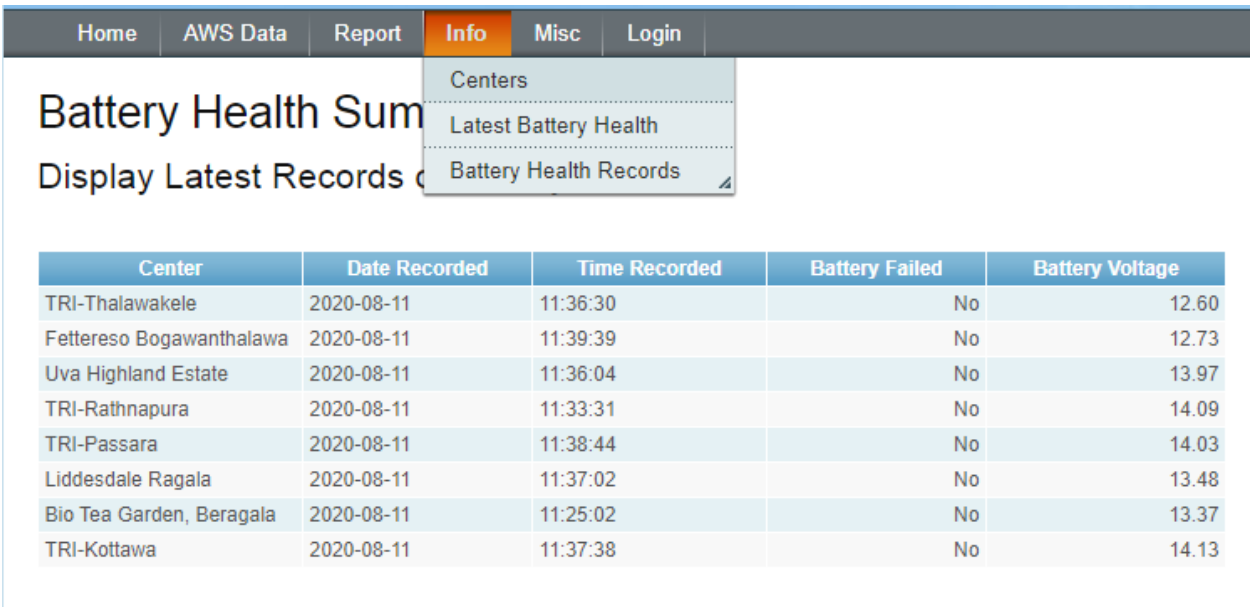
Pic. VI – Select Center for the Chart on Daily Averages

When you select this menu item and then “Center” from the drop-down list, you can get following chart. The value relevant to the point will be displayed, when you move mouse pointer and data sets can be temporarily removed by clicking on “legends” at the bottom of the chart.



Pic. VI – Chart on Daily Averages of last 30 Days

Battery Health



Center	Date Recorded	Time Recorded	Battery Failed	Battery Voltage
TRI-Thalawakele	2020-08-11	11:36:30	No	12.60
Fettereso Bogawanthalawa	2020-08-11	11:39:39	No	12.73
Uva Highland Estate	2020-08-11	11:36:04	No	13.97
TRI-Rathnapura	2020-08-11	11:33:31	No	14.09
TRI-Passara	2020-08-11	11:38:44	No	14.03
Liddesdale Ragala	2020-08-11	11:37:02	No	13.48
Bio Tea Garden, Beragala	2020-08-11	11:25:02	No	13.37
TRI-Kottawa	2020-08-11	11:37:38	No	14.13

Pic. VII – Latest Health Summary

This will display latest voltage of batteries in each station and “Battery Health Records” will display how battery voltage is changing in recent hours. These are totally for maintenance purposes of the weather stations.

Center Info

This is for storing data of weather stations such as name, address, contact details, location info etc. The System Administrator can only add/update these data.

For More Info:

T.P. +94-11-2651880, +94-11-2651567

Email: info@awsdata.lk, info@accimt.ac.lk