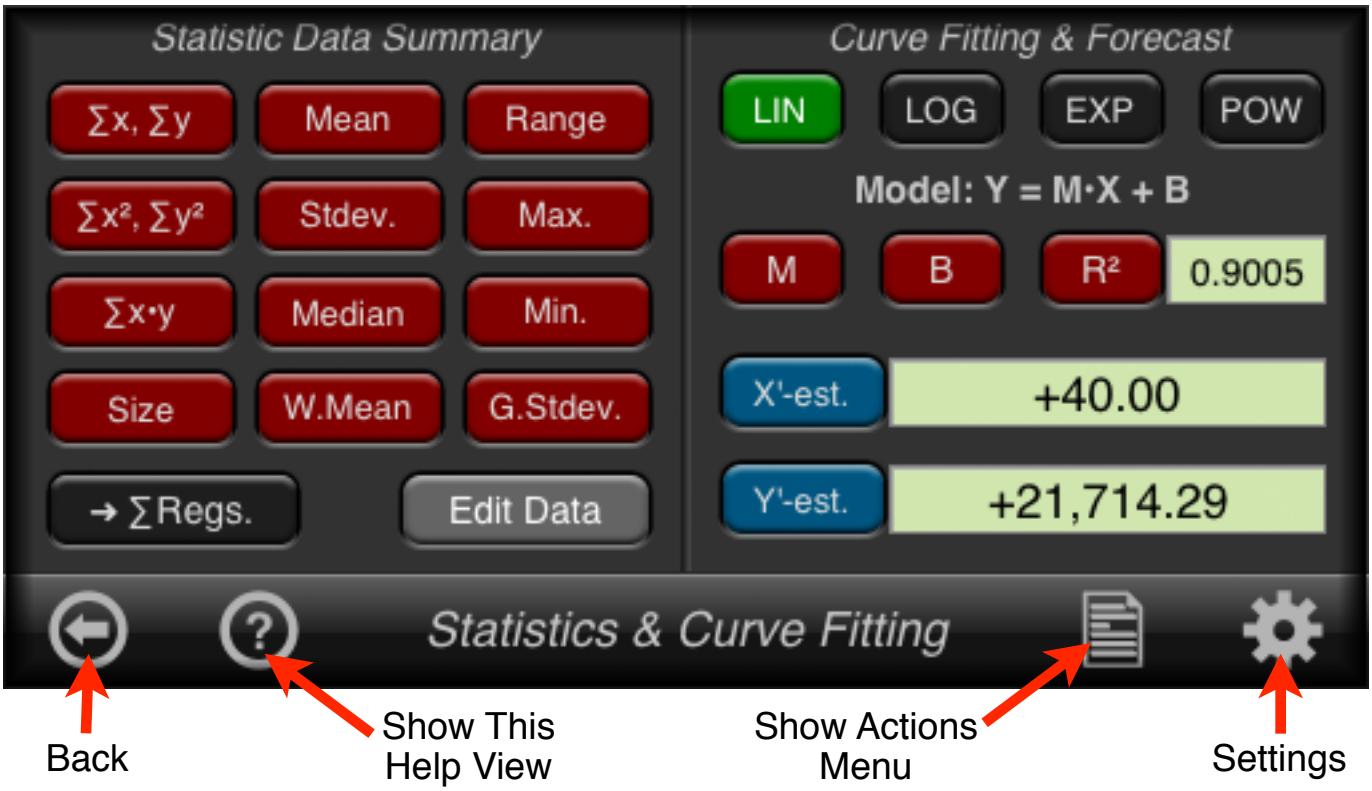
Statistics & Curve Fitting Tool

This tool allows you to store or edit a list of X and Y data pairs to statistically analyze it. Many statistic figures can be calculated and four models of curve-fitting can be applied for forecasting calculations.



The Statistic & Curve Fitting tool has two main areas. The first is the "Statistic Data Summary" where many statistic figures can be calculated with the data in the Statistic List. The second is the "Curve-Fitting & Forecast" where any of the four regression model can be selected to estimate the Y'-value given a X'-value or vice-versa.

To review or edit the X and Y data samples currently in the Statistic List touch the "**Edit Data**" button.

The buttons description and functionality is summarized in the following table:

Statistics & Curve Fitting Buttons	
LIN LOG EXP POW	Curve-Fitting model selection buttons: **Linear** -> **$Y' = B + M \cdot X'$** **Logarithm** -> **$Y' = B + M \cdot \ln X'$** **Exponential** -> **$Y' = B \cdot e^{M \cdot X'}$** **Power** -> **$Y' = B \cdot X'^{M}$**
M B R^2	For the selected curve-fitting model, calculates the "M" coefficient, the "B" coefficient or the correlation factor "R^2".
X'-est. Y'-est.	Stores X' value for Y' forecasting or calculates X' based on Y'. Stores Y' value for X' forecasting or calculates Y' based on X'.
$\sum x, \sum y$	Calculates the total sum of the list samples. The $\sum y$ is placed in the Stack-Y registers and the $\sum x$ in the Stack-X register.
$\sum x^2, \sum y^2$	Calculates the total sum of squares of the list samples. The $\sum y^2$ is placed in the Stack-Y registers and the $\sum x^2$ in the Stack-X register.
$\sum x \cdot y$	Calculates the total sum of the products of the list samples. The result is placed in the Stack-X register.
Size	Calculates the number of samples in the statistic List.
Mean	Calculates the Arithmetic mean of the list samples. The Y-mean is placed in the Stack-Y and the X-mean in the Stack-X.
Stdev.	Calculates the standard deviation (S) of the list samples. The Sy is placed in the Stack-Y and the Sx in the Stack-X.
Median	Calculates the Median (M) of the list samples. The My is placed in the Stack-Y and the Mx in the Stack-X.
W.Mean	Calculates the weighted mean $\sum X_i \cdot Y_i / \sum X_i$.
Max.	Calculates the Maximum of the list samples. The Ymax is placed in the Stack-Y and the Xmax in the Stack-X.
Min.	Calculates the Minimum of the list samples. The Y-min is placed in the Stack-Y and the X-min in the Stack-X.
Range	Calculates the (Xmax - Xmin) and (Ymax-Ymin) values.
G.Stdev.	Calculates the standard deviation of the X-values grouped by frequencies specified in the Y-values.
→ ∑Regs.	Export the summation statistics of the list Statistic Registers.
Edit Data	Shows the "Statistic Data Editor" to add, review or edit the X and Y data values.

Toolbar Button Action	
	Close the view and get back to the Options Selection Menu. If the Data Editor is shown then gets back to the Statistic & Curve Fitting view.
	Shows the Help View with the this topic selected.
	Pop up the Action Menu for the Cash Flow Calculator View (see “Toolbar Actions Menu” below).
	Shows the “General Settings” view to customize the RLM-12 Finance Center application.

Actions Menu Items	
Load Data	Show the file dialog to load a previously saved data file.
Save Data	Show the file dialog to save the current data in a file.
Email Data	Build an email with the Statistic list data.
Copy Data	Copies the Statistic list data in a tab-delimited format text.
Paste Data	Paste a tab-delimited text into the Statistics list.
Clear Values	Clears to zero the X’ and Y’ variables.
Reset Data	Delete the current Statistic list and clears to zero the X’ and Y’ variables.
Cancel	Close the actions menu.

Statistic Data Editor View

This view allows you to add or edit X, Y data pairs. To show this view, press the "**Edit Data**" button.

The buttons description and functionality is summarized in the following table:

Button	Action
X	Inputs the displayed number in the X-variable.
Y	Inputs the displayed number in the Y-variable.
Swap	Swaps the list X and Y columns.
X-Serie	Serialize the X-value column in the list from 1 to the total number of samples.
Sort-X	Sorts the list in the X-column ascending order
Add	Adds the X and Y values to the end of the list.
Update	If an item is selected in the list, updates the selected X,Y sample with the supplied data.
Delete	Deletes the current selected sample in the list.

Example: Curve Fitting

RLM advertises on a local radio station. For the past six weeks, the manager has kept records of the number of minutes of advertising that were purchased, and the sales for that week. The data is as follows:

Week	Minutes	Sales
1	2.0	$1,400
2	1.0	$920
3	3.0	$1,100
4	5.0	$2,265
5	5.0	$2,890
6	4.0	$2,200

RLM wants to know whether there is a linear relationship between the amount of radio advertising and the weekly sales. If a strong relationship exists, what amount of sales should be expected for a 7 minutes of advertising?, and to have $3,000 in sales, how many minutes should advertise?.

Solution:

First, expand the RLM-12 Finance Center to show the “Options Selection Menu” and select the “Statistic & Curve Fitting” option. Then follow the next sequence:

Keystrokes	Description
Edit Data	Shows the “Statistic Data Editor” view.
Touch 	Display the Actions Menu.
Touch “**Reset Data**”	Clears all the data in the list.
Type “2” X Type”1400” Y	Type the first X sample and touch “X”. Type the first Y sample and touch “Y”
Touch Add	Touch “Add” to add the X,Y pair in the Statistic list.
Type “1” & X Type”920” Y	Type the next X sample and touch “X”. Type the next Y sample and touch “Y”

Keystrokes	Description
Touch Add	Touch “Add” to add the X,Y pair in the Statistic list.
Type “3” & X Type”1100” Y	Type the next X sample and touch “X”. Type the next Y sample and touch “Y”
Touch Add	Touch “Add” to add the X,Y pair in the Statistic list.
Type “5” & X Type”2265” Y	Type the next X sample and touch “X”. Type the next Y sample and touch “Y”
Touch Add	Touch “Add” to add the X,Y pair in the Statistic list.
Type “5” & X Type”2890” Y	Type the next X sample and touch “X”. Type the next Y sample and touch “Y”
Touch Add	Touch “Add” to add the X,Y pair in the Statistic list.
Type “4” & X Type”2200” Y	Type the next X sample and touch “X”. Type the next Y sample and touch “Y”
Touch Add	Touch “Add” to add the X,Y pair in the Statistic list.
Touch 	Close the Statistic editor view and gets back to the Statistic & Curve Fitting view.
Type ”7” X'-est.	Type the 7 minutes of advertising and enter it to the X’-estimation variable
Touch Y'-est.	Calculates the expected sales. **Result = $3,357.38**
Type ”3000” Y'-est.	Type the $3000 of sales and enter it to the Y’-estimation variable
Touch X'-est.	Calculates the estimated advertising minutes. **Result = 6.16 minutes**