

PL Calculator

The PL Calculator is a Microsoft Excel spreadsheet that calculates the viability of a PL network. The operation of a PL network depends on:
The cumulative current/voltage required by the PL devices on each branch.
The transmission of data over RS485.
The voltage drop over the cable run.

The Excel calculator requires arbitrary figures to be included and these will very often cause a negative result when the customer enters their figures. It is necessary to use the 'Solver' which is a Microsoft Add In, to get the correct result.

1. Open the PL Calculator. This can be opened from:
 - a) The System manager software bundle.
 - b) By opening Excel and going to *File – Open*.
 - c) Using the *Open* icon on the tool bar.

It has been found that the calculator program will not open successfully on some individual computers from certain of the above methods. If you find that the program does not open successfully for you then try another method of opening the program.

2. Type in the PL devices in your proposed system. Begin with the PL farthest away from the iDR and type in the cable length between the PL and the next PL.
3. A negative result is to be expected at this stage.

iDR PL Calculator V1.30

This page is used to enter the devices to be on the Root from the iDR.

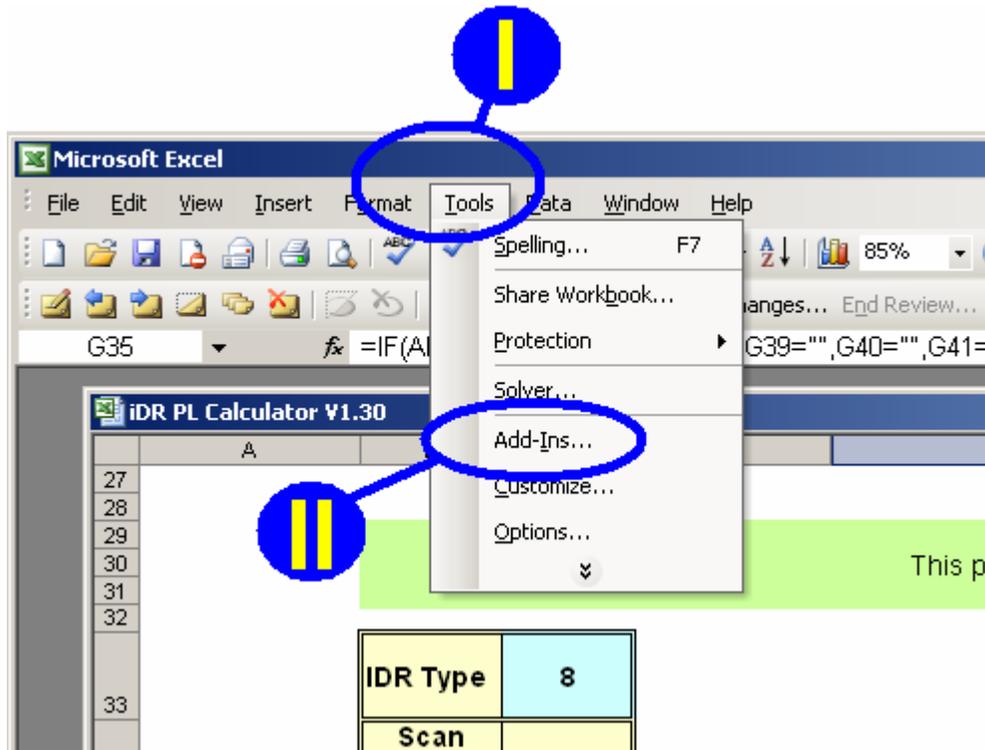
PL Number, (counting from far end)	PL Type Number (3-4,6-10)	Cable Length from preceding PL (m). (Total<= 500m)	Voltage at this PL (V)	Current Consumption of this PL at this voltage (A)	Current At This PL (A)	Remainder of iDR's 1A Current Capacity (%)	Device Time
1	10	100.0	18.85	0.0744	0.074	92.6%	3.5
2	4	50.0	19.42	0.0292	0.104	89.6%	2
3	4	60.0	19.96	0.0281	0.132	86.8%	2
4			20.78		0.132	86.8%	
5			20.78		0.132	86.8%	
6			20.78		0.132	86.8%	
7			20.78		0.132	86.8%	
8			20.78		0.132	86.8%	
9			20.78		0.132	86.8%	
10			20.78		0.132	86.8%	
11			20.78		0.132	86.8%	
12			20.78		0.132	86.8%	
13			20.78		0.132	86.8%	
14			20.78		0.132	86.8%	
15			20.78		0.132	86.8%	
Total Length		210	20.78		0.13	86.8%	

Result

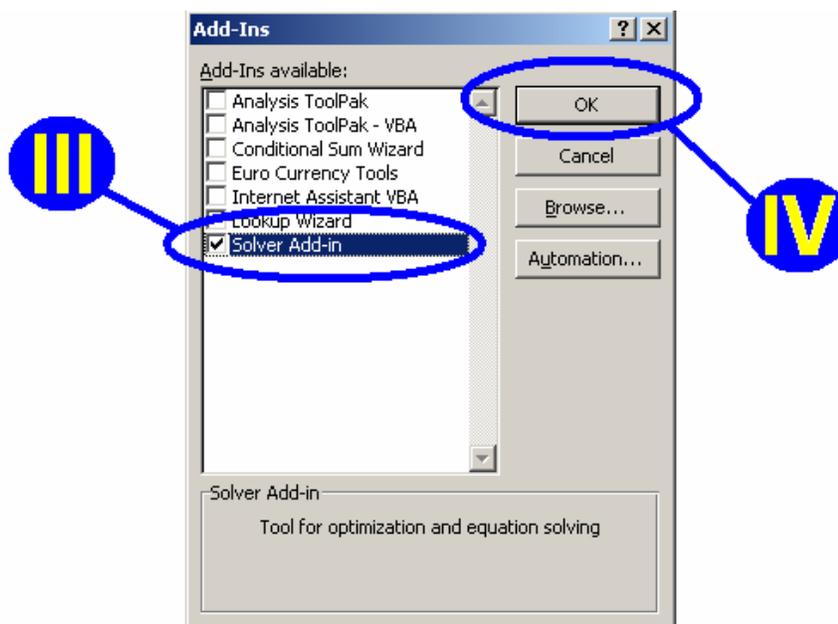
Too high a voltage required! Run the solver and remove this message reduce load (number and/or reduce cable length) and run solver and disappears

It is now necessary to use the *Solver*. Click on *Tools* on the Excel toolbar and you may see the solver already installed. If you do not see it then:

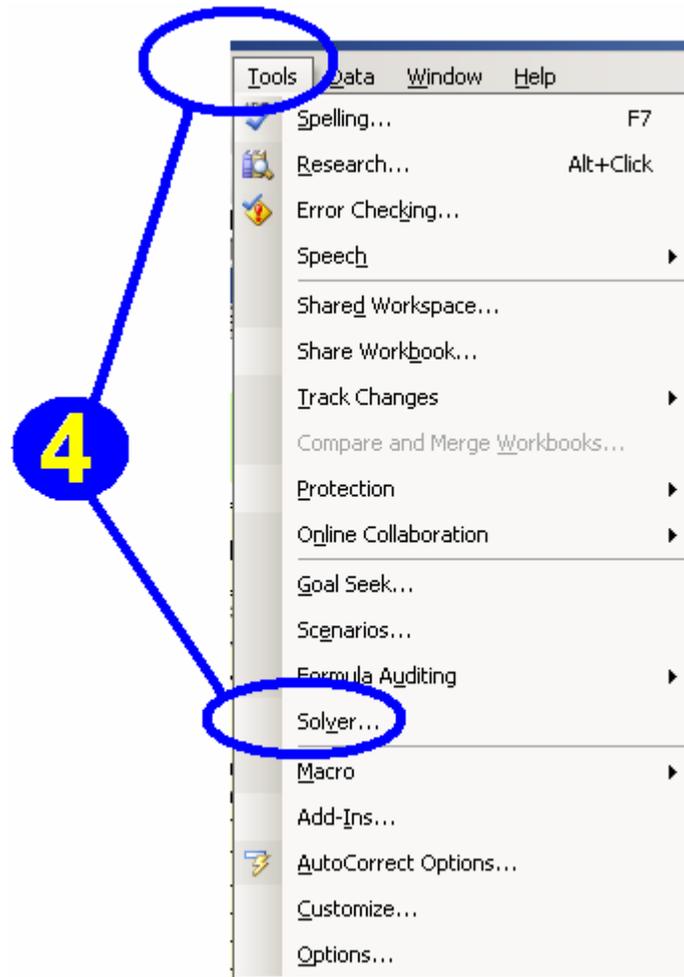
- I. Select *Tools*.
- II. Select *Add-Ins*



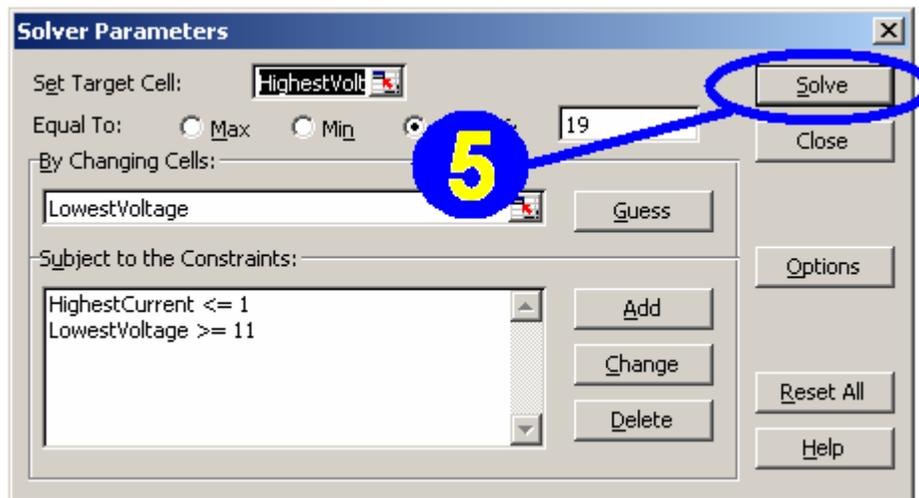
- III. Check the *Solver Add-In*.
- IV. OK.



4. From the *Tools* menu select *Solver*.



5. In the Solver window click *Solve*.



6. The result now given can be considered a good indication whether positive or negative, of the viability of the proposed network. While the calculator is a very useful tool it must be remembered that it is theoretical and cannot be acted on as a guarantee of the viability of the proposed network.

The screenshot displays a network calculator interface. On the left, a vertical diagram labeled "PL-Anet Layout" shows a series of 15 ports connected to a "Terminator" at the top and a "Closest PL" at the bottom. The ports are numbered 1 through 15. The main area contains a table with the following data:

PL Number, (counting from far end)	PL Type Number (3-4,6-10)	Cable Length from preceding PL (m). (Total<= 500m)	Voltage at this PL (V)	Current Consumption of this PL at this voltage (A)	Current At This PL (A)
1	10	100.0	16.66	0.0824	0.0824
2	4	50.0	17.51	0.0315	0.1139
3	4	60.0	18.10	0.0309	0.1448
4			18.80		0.1757
5					0.2066
6					0.2375
7					0.2684
8					0.2993
9					0.3302
10					0.3611
11					0.3920
12					0.4229
13					0.4538
14					0.4847
15					0.5156
Total Length			210	19.00	0.14

A "Solver Results" dialog box is open in the center, displaying the message: "Solver found a solution. All constraints and optimality conditions are satisfied." It includes options for "Keep Solver Solution" (selected) and "Restore Original Values", along with "OK", "Cancel", "Save Scenario...", and "Help" buttons.

At the bottom, a large green box contains the text "Result" and a green checkmark. To the right of this box, a green text box states: "All OK. This is a good set lengths. If you have not a to see the likely voltages".

The bottom navigation bar shows a sequence of tabs: "Root from iDR", "Branch A", "Branch B", "Branch C", "Branch D", "Branch E", "Branch F", "Branch G", and "Infor".