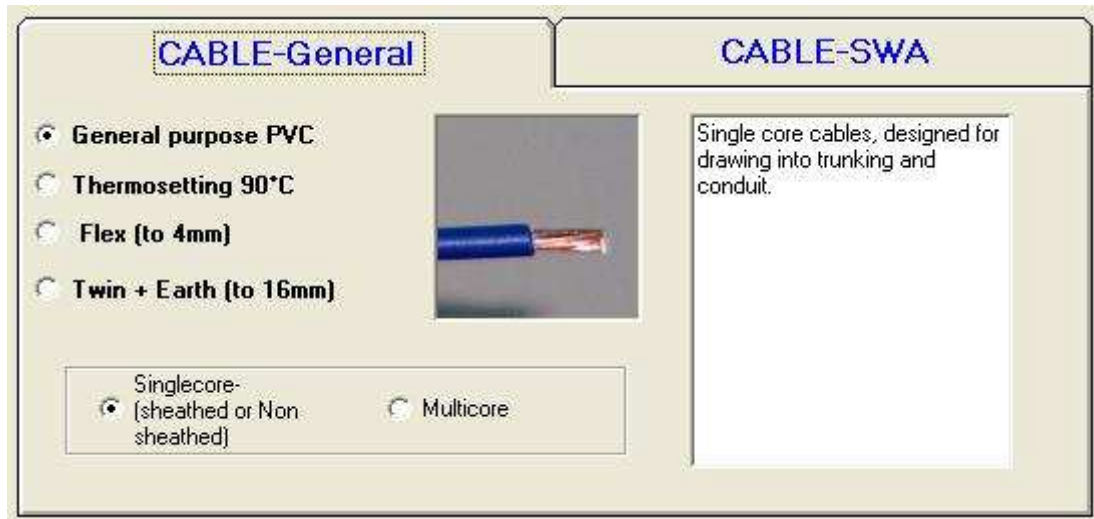


# CABLE-MATE Lite version 1.2

## 1: Calculate cable size

### Step 1. Select Cable type

Select the 'Cable type' from the different TABS, and either 'Singlecore' or 'Multicore'.



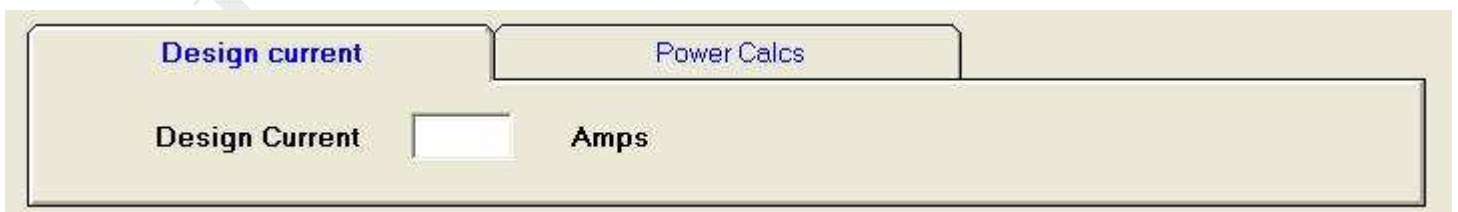
### Step 2. Circuit details and protective device type

Select required supply voltage from the drop-down box, Enter the length of cable to be installed in the 'Length of run' box, and a value for Power Factor if known or leave as 1 (the default value)



**NEXT.** Directly enter a design current value in the 'Design current' box, under the 'Design current' TAB.

**(If at any time you change any of these values, any calculations performed will be reset!)**



**OR.** Enter a power value in watts into the 'Power' box, and press the 'Calc' button, under the 'Power Calcs' TAB.

**(If at any time you change any of these values, any calculations performed will be reset!)**

Enter the 'Supply side impedance Ze' into the box, if not known use one of the default values given for the correct supply type.

**Supply impedance Ze**  ohms Enter the measured value or use a typical value (TN-C-S) = 0.35 (TN-S) = 0.8 (TT) = 21

Choose a 'Protective device type' from the drop down box.  
Select a 'Rating' value for the chosen protective device from the drop down box

**Protective Device**  
Protective Device  Rating  Amps

### Step 3. Installation method

Click on the appropriate 'Installation Method' from the selection available, consult the 17<sup>th</sup> Edition regulations for more information. If you keep the mouse over the 'Installation method description', its method letter will be shown.

(For certain installation methods, if more than one cable/circuit exists then a distance between cables or ducts, for example, must be made **before** the number of cables/circuits is selected from the grouping factor list)  
example:

Duct to Duct clearance for MORE than one circuit (a)  m Or  
 Spaced 1 diameter  Touching  
(these are shown for the relevant installation methods)

### Step 4. Factors

Select the appropriate 'Correction factors' from the drop down boxes, 'Grouping factor', 'Ambient temperature' and 'Thermal insulation correction factor'.


**TABLE 4C1** Number of circuits or multicore cables including this one

**TABLE 4B1** Ambient Temperature  °C

**TABLE 52.2** Thermal insulation correction factors, length in insulation (mm)

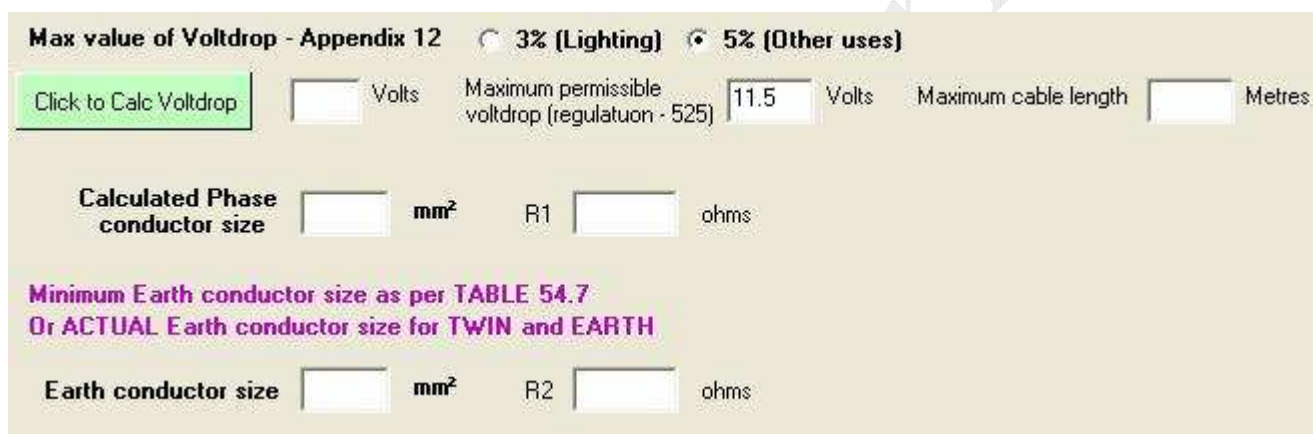
### Step 5. Calculate Cable size

Press the 'Click to Calc Cable Size' button to calculate cable size.



Click to Calc Cable size    Current carrying capacity of cable     Cable size selected

**NEXT.** Press the 'Click to Calc Voltdrop' button to check the voltdrop for the calculated cable size, **if the calculated cable size voltdrop is too high, the software will increase the cable size to satisfy the voltdrop regulations.**



Max value of Voltdrop - Appendix 12     3% (Lighting)     5% (Other uses)

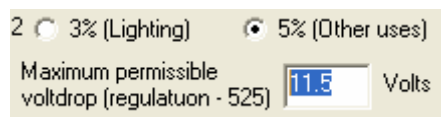
Click to Calc Voltdrop     Volts    Maximum permissible voltdrop (regulation - 525)  Volts    Maximum cable length  Metres

Calculated Phase conductor size  mm<sup>2</sup>    R1  ohms

Minimum Earth conductor size as per TABLE 54.7  
Or ACTUAL Earth conductor size for TWIN and EARTH

Earth conductor size  mm<sup>2</sup>    R2  ohms

(You can enter a different value for voltdrop if you should need to, up to the maximum permissible value by highlighting the value in the Max permissible voltdrop box with your mouse and entering a new value)



2  3% (Lighting)     5% (Other uses)

Maximum permissible voltdrop (regulation - 525)  Volts

This also gives a maximum length of cable value, if your cable length is near to this value then it may be wise to increase the cable size further to allow for any possible additions in the future.

**If at any time you change any of the values, you will have to recalculate the cable size and voltdrop again!**

The calculated cable size and Earth conductor size are displayed.

### Step 6. Check the disconnection time

Use the drop down box to select the required 'Max Disconnection time' as stated in the 17<sup>th</sup> edition Regulations.

Use the drop down box to select the 'Max cable operating temp' depending on the type of cable insulation.

Choose either to use the 80% values of Zs for comparison as per APPENDIX 12 or the Maximum permissible values of Zs.

Press the 'Click to Check' button to calculate the actual earth fault loop impedance Zs, and to compare this value with the choice of Zs for comparison.

Phase conductor size  mm<sup>2</sup> R1  ohms      Earth conductor size  mm<sup>2</sup> R2  ohms

MAX Disconnection time  Regulation 411.3.2.2 (TABLE 41.1) or 411.3.2.3

MAX cable operating temp  PVC = 70 °C    THERMOSETTING = 90 °C : TABLE 52.1

**Value of Zs for comparison**

80% Values       Max permissible Values      APPENDIX 12

Earth Fault Loop Impedance Zs

Earth Fault Loop current  Amps

Maximum permitted Zs

[Click to Check](#)

If the calculated value of earth fault loop impedance Zs is less than the Max or 80% permitted value then a **TICK** icon and message will show

If the calculated value of earth fault loop impedance Zs is greater than the Max or 80% permitted value then a **NO** icon and message will show, *(you will then be given the opportunity to automatically increase the Earth conductor size in order to try and reduce the earth fault loop impedance Zs, if so then you will have to press the 'Click to Check' button again to recalculate the actual earth fault loop impedance Zs once more with the new value of Earth conductor.)*



or



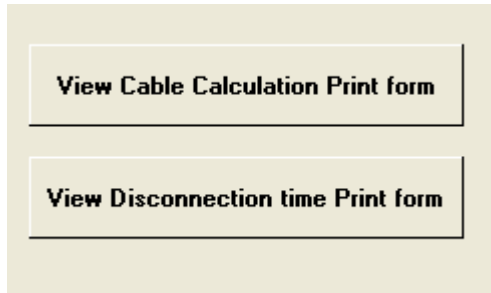
If at any time you change any of the values, you will have to recalculate the Disconnection time again.

### Step 7. Finish

The Final Calculated Cable size and Earth conductor size are displayed.

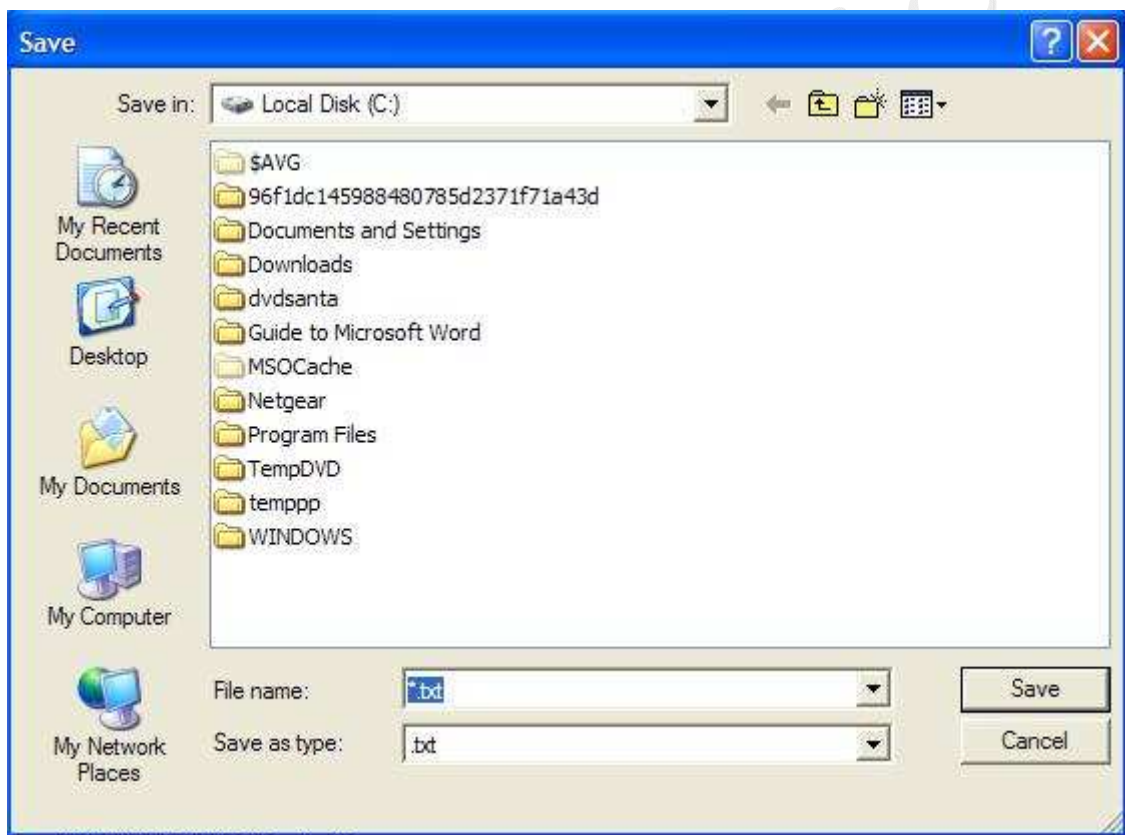
To print out a copy of the Cable calculations press the 'View Cable Calculation Print Form' button. This will display the Print page for the cable calculations.

To print out a copy of the Disconnection time calculations press the 'View Disconnection time Print Form' button. This will display the Print page for the disconnection time calculations.



These buttons will only show the print pages if the calculations have been done first!

The print pages will allow you to print the results as they are displayed on the screen or you can use the 'Save to File' button to save a copy of the results as a TEXT file.



The TEXT file will be a **.txt** file which can be opened with Notepad and most word processor programs, results can then be 'copied and pasted' into reports or write-ups. Wherever possible, the relevant 17<sup>th</sup> edition Regulations are quoted and equations are shown.

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**If in doubt consult a qualified electrician.**

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