



DLTCAD 2014 CALCULATIONS

See Engineering Data [here](#).

MECHANICAL CALCULATIONS PERFORMED ON CONDUCTORS.

This option is applicable in two phases:

Pre-design stage: Users can generate a table of mechanical calculations performed on conductors according to the defined range and difference in the altitude of the spans considered. This is very useful for calculating the performance of transmission line supports as well as for doing other analysis prior to the development of the distribution of structures.

Stage design: This step automatically calculates the catenary and its components for all the spans found according to a selected hypothesis. At this stage, a recalculation of the catenary, spans, conductor strength, sags, and other transmission line parameters are performed, whenever an action involving variation of any of these values is required. For example, relocating a support, or selecting another hypothesis, or changing EDS.

For the calculation of the catenary of the overhead conductors as well as for other parameters, the exact hyperbolic equations are used. Finite numerical methods are used for solving the change of state equations. Using this procedure, maximum accuracy in calculations is achieved by taking the advantages offered by the personal computer.

Vano	Desnivel	Hip. 1			Hip. 2			Hip. 3		
(m)	(m)	TiroH(Kg)	TMax(Kg)	Flecha(m)	TiroH(Kg)	TMax(Kg)	Flecha(m)	TiroH(Kg)	TMax(Kg)	F
10,00	0,00	1322,28	1322,28	0,01	1983,62	1983,83	0,00	1818,52	1818,93	C
20,00	0,00	1322,28	1322,30	0,03	1981,26	1981,27	0,02	1818,45	1818,47	C
30,00	0,00	1322,28	1322,32	0,06	1977,02	1977,04	0,04	1817,66	1817,71	C
40,00	0,00	1322,28	1322,35	0,10	1971,12	1971,17	0,07	1816,59	1816,67	C
50,00	0,00	1322,28	1322,39	0,16	1963,63	1963,70	0,11	1815,24	1815,37	C
60,00	0,00	1322,28	1322,43	0,23	1954,60	1954,71	0,15	1813,64	1813,83	C
70,00	0,00	1322,28	1322,49	0,31	1944,12	1944,26	0,21	1811,81	1812,07	C
80,00	0,00	1322,28	1322,55	0,41	1932,26	1932,45	0,28	1809,78	1810,12	C
90,00	0,00	1322,28	1322,62	0,51	1919,14	1919,38	0,35	1807,59	1808,01	C
100,00	0,00	1322,28	1322,70	0,63	1904,87	1905,16	0,44	1805,25	1805,78	C

OVERHEAD TRANSMISSION LINES CLEARANCES.

Vertical distances of conductor to the ground:

DLTCAD 2014 evaluates de vertical distances between all points of the catenary and ground. It does this by taking as reference the limits specified by the user and by contemporary safety code standards. It also incorporates options that allow users to set different safety distances for special cases called attributes. For example: road crossing, streets, rivers, and obstacles. When it is necessary, for these cases, users can create new attributes and set up independent vertical safety distances. During design, the software evaluates vertical safety distances to all points of the transmission line topographic profile, generating graphic alarms should any catenary be below establish limits, enabling the user to take necessary corrective actions.

Distance between conductors:

In the middle of each span, the software calculates the distances between overhead conductors of different phases. It does this by considering the geometry of the structures that provide support for the conductors; then, the calculated distances are compared with the permissible values specified by contemporary technical standards. Should a particular span be found non-compliant with these standards, a graphical alarm is generated.

Applying this option could easily help define, during design time, the maximum length of each span by a method of electrical safety spacing between conductors, which is based on the geometry of the structures used and also according to the transmission line topographic profile.

CALCULATION OF SWING OF CHAIN OF INSULATORS

(Available in DLTCAD 2014 Full)

The software evaluates the distance that strings of insulators oscillate back and forth due to wind conditions, and presents a graphical alarm when the permissible limits are exceeded. It allows for the addition of counterweights to be applied at the bottom of the chain of insulators and automatically recalculates the new swing conditions.

SAG CALCULATIONS AND REPORT TABLES.

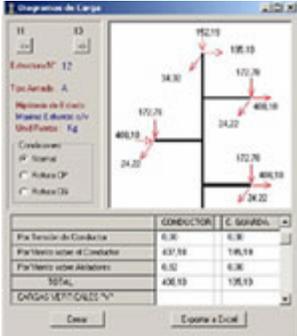
The software generates sag tables for stringing conductors on the selected transmission line structures. Calculations are performed for a range of temperatures, and the tables show the sags and the stringing of conductors. Sag tables are reportable in Excel format.

Nº	Anchura	Vano [m]	Vano [m]	Desnivel[m]	Temp[°C]	4.00	6.00	8.00	10.00	12.00	14.00
2	S-0	377.18	298.00	28.54	Comensal	23.75	23.79	23.83	23.87	23.91	23.95
					Fachal	5.50	5.56	5.62	5.69	5.75	5.8
					Tostif	1326.46	1311.36	1296.66	1282.33	1268.39	1254.78
3	S-6	377.18	315.00	95.88	Comensal	28.49	28.95	29.41	29.87	30.34	30.8
					Fachal	6.25	6.33	6.40	6.47	6.54	6.6
					Tostif	1311.96	1296.95	1282.36	1268.11	1254.27	1240.84
4	S-3	377.18	395.00	21.07	Comensal	12.36	12.53	12.70	12.85	13.00	13.15
					Fachal	7.08	7.08	6.97	6.86	6.75	6.64
					Tostif	1304.06	1289.83	1274.82	1259.57	1245.52	1231.74
5	S-3	377.18	296.00	4.59	Comensal	9.91	10.05	10.19	10.32	10.44	10.56
					Fachal	9.85	9.87	9.88	9.89	9.90	9.91
					Tostif	1296.85	1281.39	1266.54	1252.05	1237.96	1224.24
6	S-3	377.18	437.00	11.90	Comensal	6.38	6.43	6.47	6.51	6.55	6.59

LOAD TREES

(Available in DLTCAD 2014 Full)

The software calculates and displays the tree structure for each load, simulating the behavior in normal and breakdown conditions of the conductors. The results are displayed graphically for each transmission line support, or presented in a scoreboard which is exportable in Excel format.



ANALYSIS OF TRANSMISSION LINE COUNTER PROFILES

(Available in DLTCAD 2014 Full)

This concept is especially important in areas where the transversal line slopes are significant. So it is necessary to analyze the vertical clearances of upside conductors. The software incorporates a counter profiles data table that can be edited by the user. It allows for the definition of up to three counter profiles that are parallel to the axis of the transmission line, and this allows users to control conductor clearances during design.
