Using D-Cerno AE Power calculator

1. Introduction

This application note explains how to use the D-Cerno AE power calculator

The D-Cerno AE power calculator is an important tool to determine :

- how much units can be connected per branch , depending on type of units , section of cables , length of cables

    PS : there is an absolute max datacable length of 80m allowed

    PS :Due to the used datasignal type, an absolute max limit of 25 units per branche or loop always applies

- Detect were potential problems of overcurrent or power loss may occur

- In the calculator tool the NEXTs are presumed to be **powered locally and individually** (no power daisy chain!) via a 71.98.0340 – D-Cerno PS

2. Calculator overview no F/MM

In example below a screenshot of the calculator tool

The calculator tool allows calculation up to 10 NEXT in one branch/loop to the D-Cerno AE

3.   Calculator tool parameters

3.1.   Legend

Each parameter has a specific color , which indicates its function

Legend
User input from dropdown
Number of units on a port
Length input in meters
Optional, free format
Pre-defined, do not alter
Calculated, do not alter

Total power at 48 V	
175,45	[W]
Total number of devices	
75	

3.2.   Branch name (optional)

Each branch name can be edited to enter cabling diagram reference for example

Port	Name
1	
2	
3	
4	
1	
2	
3	
4	

3.3.   Device type selection

Via drop down menu device type selection can be made ; this will automatically result in another max power indication

Set the amount of units on this branch

If a mix of unit types is used , select the one with highest max power

3.4. Running datacable length and section

Enter the length of the running datacable (cable from NE/NEXT or AE port to first unit in the branch). Select also the used cable section (AWG value) via the drop down menu .

The Ohm/m value will be automatically adapted depending on selected AWG value

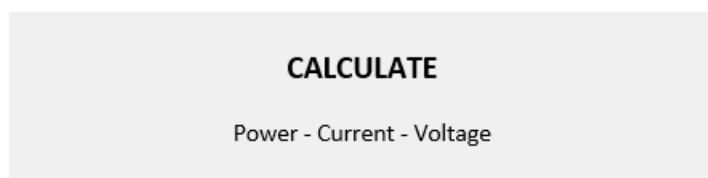## 3.5. Datacable length and section between units

Enter the average length of the datacable between devices in that branch . Select also the used cable section (AWG value) via the drop down menu .

The Ohm/m value will be automatically adapted depending on selected AWG value

3.6. Calculation

Press the calculate button to check the results

3.6.1. Result can not be calculated

If a result can not be calculated due to some settings that are very far out of acceptable limits , an
"invalid" message appears for all branches

Power				Current		Voltage		
Devices [W]	Cable [W]	Total [W]	Supply [W]	Port [A]	Supply [A]	Port [V]	First device [V]	Last device [V]
invalid	invalid	invalid		**invalid**		invalid	invalid	invalid
invalid	invalid	invalid		**invalid**		invalid	invalid	invalid
invalid	invalid	invalid		**invalid**		invalid	invalid	invalid
invalid	invalid	invalid		**invalid**		invalid	invalid	invalid

3.6.2. Result out can be calculated but result is out of specs

Non allowed end results are marked in red : check what parameters can be changed to obtain a better
result (other cable section , less units per branch…)

Max current may not exceed 2A

Voltage at end of line may not be less the 36V

Power				Current		Voltage		
Devices [W]	Cable [W]	Total [W]	Supply [W]	Port [A]	Supply [A]	Port [V]	First device [V]	Last device [V]
50,00	22,25	72,25	199,42	1,51	4,15	48,0	35,2	**32,3**
50,00	24,39	74,39		1,55		48,0	35,5	**30,7**
20,00	0,39	20,39		0,42		48,0	47,3	47,0
20,00	0,39	20,39		0,42		48,0	47,3	47,0

Power				Current	
Devices [W]	Cable [W]	Total [W]	Supply [W]	Port [A]	Supply [A]
50,00	6,51	56,51	**238,80**	1,18	**4,98**
50,00	12,69	62,69		1,31	
50,00	3,80	53,80		1,12	
50,00	3,80	53,80		1,12	

3.6.3. Results all within allowed limits

No red markings , so results acceptable

Power				Current		Voltage		
Devices [W]	Cable [W]	Total [W]	Supply [W]	Port [A]	Supply [A]	Port [V]	First device [V]	Last device [V]
50,00	6,51	56,51	171,99	1,18	3,58	48,0	44,0	41,7
50,00	12,69	62,69		1,31		48,0	41,0	37,0
20,00	0,39	20,39		0,42		48,0	47,3	47,0
20,00	0,39	20,39		0,42		48,0	47,3	47,0
20,00	0,16	20,16	47,32	0,42	0,99	48,0	47,8	47,5
20,00	0,16	20,16		0,42		48,0	47,8	47,5

3.7. Total power use for all no devices on this NEXT

Power				Current	
Devices [W]	Cable [W]	Total [W]	Supply [W]	Port [A]	Supply [A]
50,00	6,51	56,51	**238,80**	1,18	**4,98**
50,00	12,69	62,69		1,31	
50,00	3,80	53,80		1,12	
50,00	3,80	53,80		1,12	

If total power exceeds 211W or max current exceeds 4.4A , result is marked in red (cfr specification
power adaptor 71.98.0340 – D-Cerno PS)