

# 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 data cable 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

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

79

33

CALCULATE

Power - Current - Voltage

D-Cerno AE

D-Cerno PS

D-Cerno microphone

D-Cerno Power Calculator Version 1.14b

Port	Name	Devices per port				Cabling to first device				Cabling between devices				Power		Current		Voltage		Last device [V]
		Type	Number	Power [W]	Type	Length [m]	Resistance [Ohm/m]	Type	Length [m]	Resistance [Ohm/m]	Devices [W]	Cable [W]	Total [W]	Supply [V]	Port [A]	Supply [A]	Port [V]	First device [V]		
CENTRAL UNIT	1	D-Cerno SL	25	2	24 (standard)	30	0.0842	24 (standard)	2	0.0842	50.00	4.96	54.96	128.13	1.14	2.67	48.0	45.1	43.0	
	2	D-Cerno SL	10	2	24 (standard)	20	0.0842	24 (standard)	2	0.0842	20.00	0.39	20.39		0.42		48.0	47.3	47.0	
	3	D-Cerno SL	10	2	24 (standard)	20	0.0842	24 (standard)	2	0.0842	20.00	0.39	20.39		0.42		48.0	47.3	47.0	
	4	D-Cerno SL	10	2	24 (standard)	20	0.0842	24 (standard)	2	0.0842	20.00	0.39	20.39		0.42		48.0	47.3	47.0	
NETWORK EXTENDER	1	D-Cerno SL	10	2	24 (standard)	5	0.0842	24 (standard)	2	0.0842	20.00	0.16	20.16	47.32	0.42	0.99	48.0	47.8	47.5	
	2	D-Cerno SL	10	2	24 (standard)	5	0.0842	24 (standard)	2	0.0842	20.00	0.16	20.16		0.42		48.0	47.8	47.5	
	3	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842							48.0			
	4	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842							48.0			
NETWORK EXTENDER	2	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842										
	3	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842										
	4	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842										
	5	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842										
NETWORK EXTENDER	3	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842										
	4	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842										
	5	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842										
	6	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842										
NETWORK EXTENDER	4	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842										
	5	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842										
	6	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842										
	7	D-Cerno SL	0	2	24 (standard)	2	0.0842	24 (standard)	2	0.0842										

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
<b>Total power at 48 V</b>
175,45 [W]
<b>Total number of devices</b>
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

Devices per port			
Type	Number	Power	
[ ]	[ ]	[W]	
D-Cerno SL	25	2	
D-Cerno SL	10	2	
D-Cerno F-M	10	2	
D-Cerno F-D	10	2	
D-Cerno SL	10	2	

### 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

Cabling to first device		
Type	Length	Resistance
[AWG]	[m]	[Ohm/m]
24 (standard)	30	0,0842
21	20	0,0842
22	20	0,0842
23	20	0,0842
24 (standard)	5	0,0842
25	5	0,0842
26 (patch)	2	0,0842
27	2	0,0842
28	2	0,0842

### 3.5. Datacable length and section between units

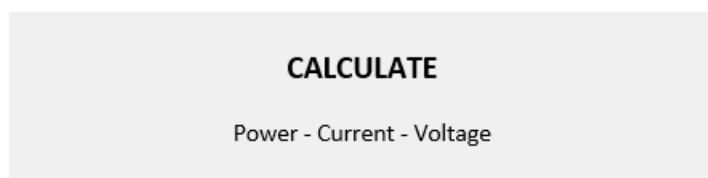
Enter the average length of the datacable between devices in that branch . Select also the used cable section (AWG value) via the drop down menu .

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

Cabling between devices		
Type [AWG]	Length [m]	Resistance [Ohm/m]
24 (standard)	2	0,0842
21	2	0,0842
22	2	0,0842
23	2	0,0842
24 (standard)	2	0,0842
25	2	0,0842
26 (patch)	2	0,0842
27	2	0,0842

## 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)