Technical Note

Segregation Distances

excel without compromise.

Metallic Data Cabling and Mains Power Cabling

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This technical note offers guidance for the general segregation distances required between copper data cabling and mains power to mitigate the effects of Electromagnetic Interference (EMI). The responsibility for assuring compliance with required standards and legislation lies with the designer and installer. The information in this Technical Note is provided in good faith.

Local and national safety regulations may require different segregation requirements and distances. Safety requirements are the priority. The more stringent requirement shall take the precedence.

The information to compile this technical note is from

BS EN 50174-2:2009 - Information technology- Cabling installation – Part 2: Installation planning and practices inside buildings.

The minimum segregation distance depends on:

- Electromagnetic immunity of the data cabling – Segregation Classification
  - o Coupling attenuation for screened balanced cables
  - o Transverse Conversion Loss (TCL) for unscreened balanced cables
  - o Screening attenuation for unbalanced (coaxial) and twin axial cables
- Construction of mains cable
- Quantity and type of electrical circuit
- The divider between the data and power cabling

$$A = S \times P$$

Final separation distance (A) = Basic Separation Distance (S) x Power Cabling Factor (P)

The requirements of the parameters determining the segregation classification is detailed in the above referenced standard and should be used if reviewing a specific cable that is not covered below. The cables are detailed in parentheses ( ) below the Segregation Classification generally comply.

		Cable Management System			
Segregation Classification	Cable Performance	None (or Non-metallic)	Open metallic containment	Perforated metallic containment	Solid metallic containment
d	Class F_A	10 mm	8 mm	5 mm	0 mm
c	Class D or E or E_A **U/FTP**	50 mm	38 mm	25 mm	0 mm
b	Class D or E or E_A **U/UTP**	100 mm	75 mm	50 mm	0 mm
a	Coaxial	300 mm	225 mm	150 mm	0 mm
Notes		Applicable to plastic containment	Screen performance (0 to 100 MHz) equivalent to weld mesh 50 mm x 100 mm and steel tray of less than 1 mm thickness (and trunking without lid)	Screen performance (0 to 100 MHz) equivalent to steel tray of 1 mm thickness (and trunking without lid). Cables to be installed at least 10 mm below top of barrier.	Screen performance (0 to 100 MHz) equivalent to steel conduit 1.5mm wall thickness.

continued overleaf

P - Power Cabling Factor

The Power Cabling Factor is based on 20 Amp, 230 Volt, 1-Phase. 3-Phase treat as 3 off 1-Phase. More than 20A treat as multiples of 20A. Lower voltage AC or DC power cables shall be treated on the current rating. E.g. a 100A 50V DC cable is equivalent to 5 off 20A cables.

Quantity of Circuits	P – Power cabling factor
1 to 3	0.2
4 to 6	0.4
7 to 9	0.6
10 to 12	0.8
13 to 15	1.0
16 to 30	2
31 to 45	3
46 to 60	4
61 to 75	5
> 75	6

Conditional Relaxation of Requirement

Where the requirements in specific EMI conditions do not apply, no segregation distance is required between power and data where:

Power - Single Phase, Total power ≤ 32A, Power conductors contained in overall sheath or twisted, taped, bundled together

Data Cable - Segregation Classification is "b", "c" or "d" & E1 environment classification of EN 50173:2007

This Technical Note has been produced by Simon Robinson, Product Manager, on behalf of Excel