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How-to: 10 Tips for Installing Solarix Cables

HOW TO INSTALL SOLARIX CABLES

This is an overview of ten main principles that describe how to correctly install Solarix cables.

These are the most important rules and procedures that apply to all currently sold Solarix installation cables of categories 5E, 6, 6A, 7 and 7A, which (where indicated) are based on the installation standard EN 50174*.

Installation cables are cables with a solid wire conductor that are primarily intended for horizontal and backbone (i.e. permanent) cabling. These cables must always be routed in a proper cable paths that are directly designed for the routing of cables and cable bundles - e.g. cable ducts, cable trays, grids, paths etc (EN 50174-2, part 4.5.1.1).

Cable routes need to be selected to provide sufficient protection against possible damage to cables apart from zones in which the cabling cannot be damaged or its transmission properties negatively affected (EN 50174-2, part 4.3.1.3).

Cable management systems must allow for the installation and removal of cables without damage and must also allow for their maintenance. Possible future expansion of the cabling must also be taken into account (EN 50174-2, part 4.5.1.1). The initial planning of the capacity of the cable route should be max. 40% (EN 50174-2, part 4.4.2.2).



Between different types of cables (e.g. data and power cables) the minimum permitted distances according to EN 50174-2, part 6.2.1 must be observed (the so-called cable segregation, see EN 50174-2, part 6), except for the conditional relaxation of the minimum distance requirement (see EN 50174-2, part 6.2.2).

4 x

The minimum bending radius of 4 x cable diameter for installation cables must be observed along the entire length of the cable route (see EN 50174-2, part 4.4.1.2). Cable routes and their individual parts (e.g. outlets, floor boxes, installation boxes, etc.) must be prepared in advance and sufficiently dimensioned for this. This is especially important for thicker and less flexible cables (e.g. CAT6 F/UTP, CAT6A U/FTP and higher).

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Cables that do not meet the requirements of the fire reaction class min. Eca (or do not meet EN 60332-1-2) must be terminated within 2 m of the internal penetration point of a fire section inside buildings or must be installed in a conduit with the above fire resistance (see EN 50174-2, part 4.1.6.2.3).



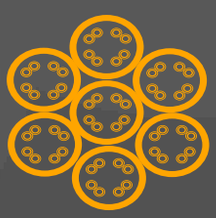
Shielded cabling with continuous connection of shielding of all products (i.e. installation cable and components on both sides of the cable) must always be properly grounded according to EN 50174-2, part 4.7.1.2. Pay attention to the different potentials of individual grounding points (must not be higher than 1 V). The system of connecting the cabling to ground and its bonding must be in accordance with EN 50310.

100 N

When installing cables, a max. tensile stress of 100 N/10 kg is allowed. It is also necessary to eliminate cable stress caused by suspension or cable bundles, along the entire length of the route, including the data rack. This applies to a single cable as wel as entire bundles (EN 50174-2, part 5.3.5.1).



Installation cables must be properly marked at both ends according to the specifications in the documentation. The marking must be permanent, unchangeable and not subject to environmental influences (EN 50174-1, part 4.3.4.1). Ideally, the marking should be printed, machine-made or manufactured as a part of the components. Hand-made marking may not be easily legible in all circumstances.



Bundles must not contain more than 24 cables (EN 50174-2, part 5.3.5.3.1). In the case of PoE, these bundles must be spaced 0.3 x bundle diameter, but at least 15 mm apart in the cable path (EN 50174-2, part 6.4). Individual cable types must always be routed in separate bundles (EN 50174-2, part 6.2.1).

EXAMPLES OF APPLICATION OF THE ABOVE RULES

- Installation cables cannot be installed directly under plaster or in a concrete floor without proper protection.
- Cables of different types (e.g. data and power cables) cannot be routed together in one cable bundle.
- The reaction-to-fire class of the installation cable (e.g. Dca, Cca, or B2ca) must always correspond to the type of building in which the cable is installed.
- Fca cables must be terminated within 2 m of the building penentration point (or routed in a cable route with the requested fire resistance).

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USEFUL TIPS

- Further information concerning all installation procedures, not only when working with installation cables, is given in detail in EN 50174-1, EN 50174-2 and EN 50174-3. We recommend that you purchase these documents and strictly follow them. They contain a lot of useful and practical information concerning the design, installation and maintenance of structured cabling.
- After installation, do not forget to test your installation with a certification tester (e.g. Fluke DSX 5000 or DSX 8000) in Permanent Link topology (i.e. with Permanent Link adapters). The result of all measured routes must be PASS.
- Never replace installation cables with another type of cable (e.g. cables with stranded conductors).
- Solarix category 6A, 7 and 7A shielded installation cables are, when following the installation instructions in this guide and the instructions in the EN 50174 standards, structurally immune to Alien Crosstalk. These cables meet the requirements for this parameter by their design (the so-called mitigation by design, see EN 50173-1, Annex A). In installations where Solarix category 6A, 7 and 7A shielded installation cables are used together with Solarix category 6A shielded components, and the installation procedures mentioned above are followed, it is not necessary to test the Alien Crosstalk parameters.

SOLARIX CABLES AND REACTION-TO-FIRE CLASSES

	Fca	Eca	Dca	Cca	B2ca
CAT5E	SXKD-5E-UTP-PE SXKD-5E-FTP-PE SXKD-5E-UTP-PEG SXKD-5E-FTP-PE-SAM SXKD-5E-FTP-PVC+PE	SXKD-5E-UTP-PVC SXKD-5E-FTP-PVC	SXKD-5E-UTP-LSOH SXKD-5E-FTP-LSOH		SXKD-5E-UTP-LSOHFR-B2ca SXKD-5E-FTP-LSOHFR-B2ca
CAT6	SXKD-6-UTP-PE SXKD-6-FTP-PE	SXKD-6-UTP-PVC SXKD-6-FTP-PVC	SXKD-6-UTP-LSOH SXKD-6-FTP-LSOH		SXKD-6-UTP-LSOHFR-B2ca
CAT6A	SXKD-6A-STP-PE		SXKD-6A-STP-LSOH SXKD-6A-FFTP-LSOH		SXKD-6A-STP-LSOH-B2ca
CAT7				SXKD-7-SSTP-LSOH	SXKD-7-SSTP-LSOHFR-B2ca
CAT7A					SXKD-7A-1200-SSTP-LSOHFR-B2ca



Flammable — Least flammable

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IMPORTANT SAFETY INSTRUCTIONS

- Solarix installation cables are exclusively intended for transmission of voltages lower than 50 V (AC) and 75 V (DC) - i.e. they can only be used for transmission of digital signals and PoE power supply (802.3af/at/bt) in data networks.
- They are intended only for permanent installation (i.e. they must be terminated in fixed termination points - i.e. patch panels, data outlets etc in Permanent Link topology) in standard environments - i.e. indoor or outdoor, always depending on the cable type.
- Apart from the MPTL topology with MPTL connectors, installation cables should not terminated with RJ45 connectors. This type of connection does not meet the requirements for the permanent termination, which may affect the quality and service life of the connection.
- The minimum length of installed segment in the Permanent Link topology must be at least 10 m, the maximum length is 90 m (this is the so-called electrical length, i.e. the actual length of the pairs in the cable).
- Cables must be protected from any damage, abrasion or cutting. Indoor cables (PVC, LSOH, LSOHFR) must also be protected from contact with water.
- Do not expose cables to any chemicals, paints, adhesives or cleaning agents, both during installation and during use of the cabling.
- No cables, even the outdoor ones with PE sheath, are intended for permanent water submersion. Also be careful of water condensation in the conduits in the outdoor environment or in an environment with rapid changes in temperature, where there may also be a risk of unwanted condensation.
- Do not store cables outdoors, in dusty or otherwise polluted environments, near sources of heat, water, or in places with shocks or vibrations.
- Do not expose cables to high temperatures. The storage and operating temperature for PVC, LSOH and LSOHFR cables is -20 °C to 60 °C, for PE cables -20 °C to 70 °C. The installation temperature is 0 °C to 50 °C.

- When selecting cables, you must assess their suitability for the given environment according to the MICE classification (i.e. Mechanical, Ingress, Climatic/Chemical, Electromagnetic), see EN 50173-1, parts 5.1.2. and G3. The selected installation cable must always correspond to the conditions of the environment in which it will be installed.
- Choose only cable routes that are free of burrs, sharp points and points that could damage the installation cables during installation or operation.
- For safety reasons, every metal element in the rack or frame must be bonded and properly grounded, even in the case of unshielded cabling or optical cabling (e.g. metal FO patch panels).
- The entire bonding and grounding system of the building must meet the requirements of EN 50310 and all related standards. This must always be verified before the design phase and the actual installation of the cabling begins.
- According to EN 50174-3, part 4.9.8.1, outdoor cabling installed in urban areas usually does not require lightning protection. However, this protection is required if the installation cables are installed outdoors in non-urban areas. Detailed information is provided in the EN 61663-2 and EN 62305 sets of standards.
- When installing Solarix cables, always observe the requirements and recommendations of the EN 50174 installation standard or the related standards listed there.
- Connect only components and connecting hardware to the cables that meet the cabling standards, especially EN 50173, ISO/IEC 11801, EN 60603-7.
- All Solarix products are for professional installation only and must be installed by a qualified or trained professional.
- Declaration of Conformity, REACH, RoHS, and all other documentation for our products can be found at www.solarix.cz
- Solarix products comply with the requirements of the relevant EU legislation and standards and are intended for placing and supplying on the European Union market.
- If all the above instructions and procedures from EN 50174 are followed, all our cables are safe to use.



If you have any packaging or parts of packaging left over after installing Solarix products, be sure to dispose of them properly.

NEED SOME ADVICE?

If you need advice with installing Solarix products, please contact us at info@solarix.cz or by phone at +420 840 505 555. This document serves as a user manual.

*) This installation guide contains only a selection of the most important installation procedures for Solarix products, for installation inside buildings. Complete rules and principles regarding the installation of structured cabling can be found in the mentioned installation standard EN 50174 and its individual parts. We always recommend having these documents available and following them strictly. Compliance with all installation procedures specified in these standards is an important criterion for fulfilling the conditions of the Solarix standard and system warranty and the only way to guarantee the correct functionality of all our products.