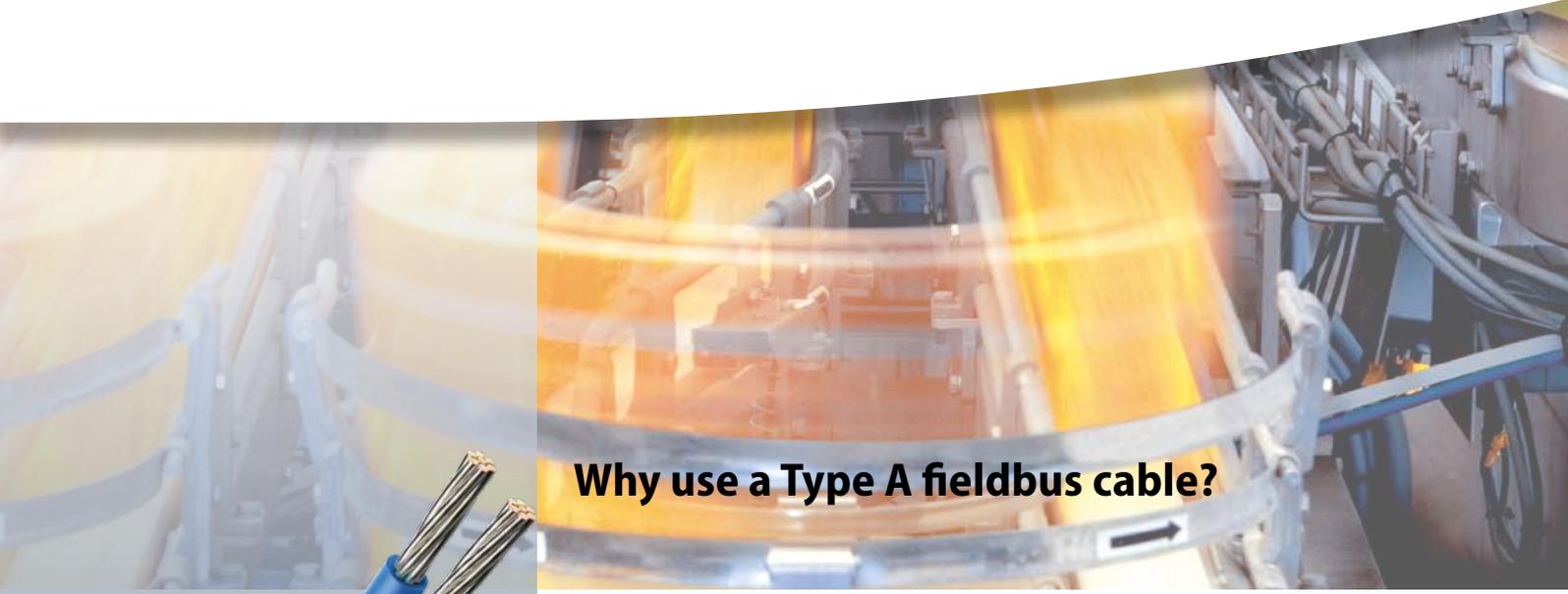


LEONI *technical report*

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Why use a Type A fieldbus cable?

Fieldbus cables are used in measurement and control systems for connecting the field devices with the centre. The cables are usually used in the field.

In contrast to instrumentation cables, fieldbuses should be dimensioned for considerably higher data rates. Control functions and the energy supply of the terminal devices as well as additional services such as active wear monitoring for the terminal devices are transmitted via these connections.

The demands made on fieldbuses in measuring and monitoring systems are defined in the standard IEC 61588-2. The standard specifies the various types A to D with their differing demands, with Type A meeting the strictest requirements. The main differences between the various types concern properties for which the requirements become much weaker from A to D as well as properties which are only defined for Type A.

The most important thing for the user is that the cables and monitoring systems installed today are future-proof and that other new services can be added easily as required. With regard to the maximum possible connection length, it must be noted that not only the feed line, but also all branch lines have to be included in the calculations. The principal properties of the cables are the propagation delay, the attenuation and the maximum permissible connection length.

Only cables designed in accordance with IEC 61158-2 Type A give the user the certainty that he is using a future-proof product in his system. It is also necessary to ensure that all other components used are coordinated with cable type A.

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New services and control options cannot be realized or can only be realized to a very limited extent using cable types B to D. For this reason, they are only suitable for systems designed for lower requirements from the start or for replacements in existing systems.

Type A (i.e. the strictest category) is required for FOUNDATION Fieldbus (and Profibus PA) systems for the reasons given above. It is not permissible to use cables of other categories.

Cable specification FF-844

The Fieldbus FOUNDATION organization has defined the different cables and components in various specifications. Fieldbuses are described in the specification FF-844. The requirements according to UL 13 or EN 50288-7 apply for the cable design and IEC 61158-2 Type A was specified with regard to the electrical properties.

The responsible committees of the UL officially decided in 2009 (and passed the relevant resolution) that cable designs in accordance with EN 50288-7 can be used in addition to designs in accordance with UL 13. This expansion already applies, but it will not yet be included in the coming new edition of FF-844. However, cables designed according to EN 50288-7 can be registered with Fieldbus FOUNDATION and used for systems based on FOUNDATION Fieldbus.

Table: Requirements according to IEC 61158-2 (a selection)

Property	Unit	Type A	Type B	Type C	Type D
max. attenuation (f = 39 kHz)	dB/km	3.0	5.0	8.0	
max. coupling to ground (l >30 m)	nF/km	4.0	6.0	not specified	
max. propagation delay	µs/km	1.7	not specified		
max. length (with all branch lines)	M	1.900	1.200	400	200