

Fieldbus Standard IEC 61158-2

Bus-types for 31.25 kbit/s – 100 Ω (e.g. PROFIBUS PA, Foundation Fieldbus)

IEC 61158-2 defines following categories for cable types for the data transfer range of 31.25 kbit/s.

Parameter	Type A	Type B	Type C	Type D
Impedance at f = 31.25 kHz	100 ± 20 Ω	100 ± 30 Ω	not specified	not specified
Max. conductor resistance	24 Ω/km	56 Ω/km	132 Ω/km	20 Ω/km
Max. attenuation at f = 39 kHz	3.0 dB/km	5.0 dB/km	8.0 dB/km	8.0 dB/km
Max. capacitance unbalance to shield	2 nF/km	not specified	not specified	not specified
Max. capacitance unbalance	not specified	6 nF/km length ≥ 30 m	not specified	not specified
Nom. conductor cross-section	0.8 mm ²	0.32 mm ²	0.13 mm ²	1.25 mm ²
Max. propagation delay change	1.7 μs/km	not specified	not specified	not specified
Min. shield coverage	90 %	not specified	not specified	not specified
Max. usable length including all spur cables	1,900 m	1,200 m	400 m	200 m

Type A is the preferred bus type nowadays.

Type A is a single pair cable with an overall shield and is made to meet the high demand of automation engineering. Belcom also offers multipair individually screened cables wherein each pair fulfils type A requirements acc. to IEC 61158-2.

Type B is an alternative type also used.

Type B is a version consisting of several pairs and an overall shield. Please note the restricted characteristics which can have a detrimental effect in case of future extensions of the plant.

Types C and D are of little importance and have been included here for the sake of completeness only.

Bus for impedance range – 100 Ω up to 220 Ω (e.g. PROFIBUS DP).

For bus use in impedance range between 100 Ω and 220 Ω, IEC61158-2 defines cable types A and B with the following characteristics:

Parameter	Type A	Type B
Characteristic impedance	135–165Ω at f=3 up to 20MHz	100–130Ω at f > 100 kHz
Conductor resistance (loop)	110 Ω/km	not specified
Minimum conductor cross-section at	0.34 mm ²	0.22 mm ²

The cable consists of one pair and an overall shield and the preferred type is type A.

Fiber optic cables

In addition to copper cables, fiber optic cables consisting of the following fiber types defined according to IEC 61158-2 are used:

Multi mode fiber	62.5/125 μm
Single mode fiber	9...10/125 μm as well as
Plastic fiber	980/1000 μm

