# Extension for 3Vir9_040 Proposal for generic single pair cabling: structure and naming in ISO/IEC 11801-1 AMD2

SC 25/WG 3 Ad-hoc on ISO/IEC 11801-1 AMD2

28th May 2026/ 18th June 2026, prepared by Peter Fischer

# New approach towards basic channels of 100m

- By 3Vir9_040 a new approach towards basic channels of 100m and ‘all other lengths (> 100 m) by calculation dependent on requirements of transmission and current capacity’ was introduced by Schicketanz/ Engels
- Several points were given to explain the specific meaning to align common understanding, however, there is a need to pre calculate additional channels for maximum implementations respectively for channels greater than 100m

→ Therefore, this presentation shall present an approach to realise basic and extended channels and this by a ‘simple’ figure

# Realisation by a ‘simple’ figure

Moved forward with findings of 3Vir9_040:

- 4 basic 100m SPE-channels, 2 ($SP1_A$ and $SP2_A$) for 10/100 Mbit/s and 2 ($SP1_B$ and $SP1_C$) for future applications

Realisation of basic channels and their scalability/ restrictions for $SP1_A$ and $SP2_A$ :

- Each one graph per channel with two parameters each: data rate (10MBit/s vs. 100MBit/s) and current carrying capacity (2 A, 0.75 A and 0.25 A)

# Structure of naming and figure precondition definitions

- We need 3 levels of differentiation, example: SP1$_{AX}$
  - SP (common for Single Pair)
  - First digit: Number 1 or 2 for the wire diameter(AWG23, AWG18) and maximum current carrying capacity (0.75 A, 2.0 A)
  - Second digit: Letter A, B or C: Cabling/ application classes, A: 10/100MBit/s; B: 1000MBit/s; C: 2500MBit/s
  - Third digit: Number X as length indicator, e.g. none means length at the maximum current carrying capacity and data rate for the class, numbers starting from 1 for longer distances at a lower performance level (current and/or data rate)

# Structure of naming and figure precondition definitions

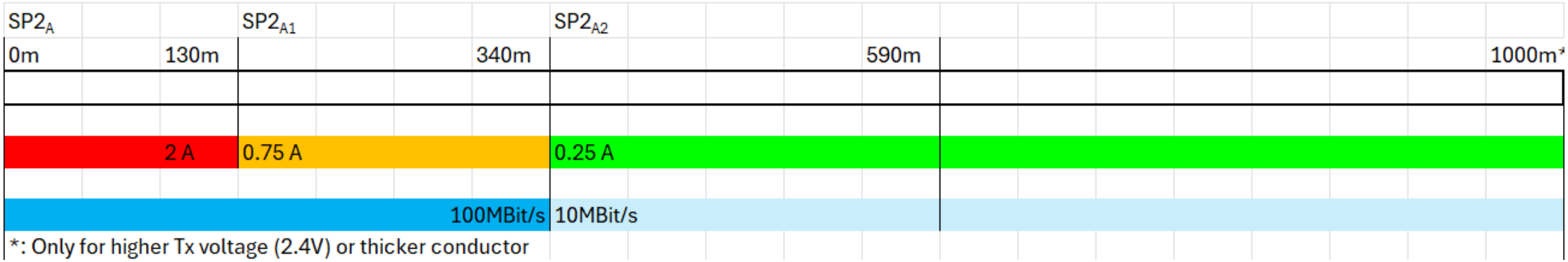
- The standard Tx level is used → Lower insertion loss allowed for channels with dg as master. All insertion losses at 20 °C.
- New channels with 50% patchcord derating except AWG18 channels (no derating).
- Current: Loop resistance and/or voltage drop (30%), using 60°C (ambient temperature + temperature increase due to powering)
- Higher voltage used as margin for "no Forward Error Correction (FEC) applications“ at the same length or for higher EMC environmental class levels (E=2 and E=3)
- Alien formulas: N= 1 used as standard

# Structure of naming and figure precondition definitions

- IEEE P802.3dg defines auto negotiation between high speed = 100BASE-T1L and low speed = 10BASE-T1L with the following priority of settings (clause 98D.1.1, decreasing from top priority):
  - High speed, standard TX level
  - High speed, increased TX level
  - Low speed, standard TX level
  - Low speed, increased TX level

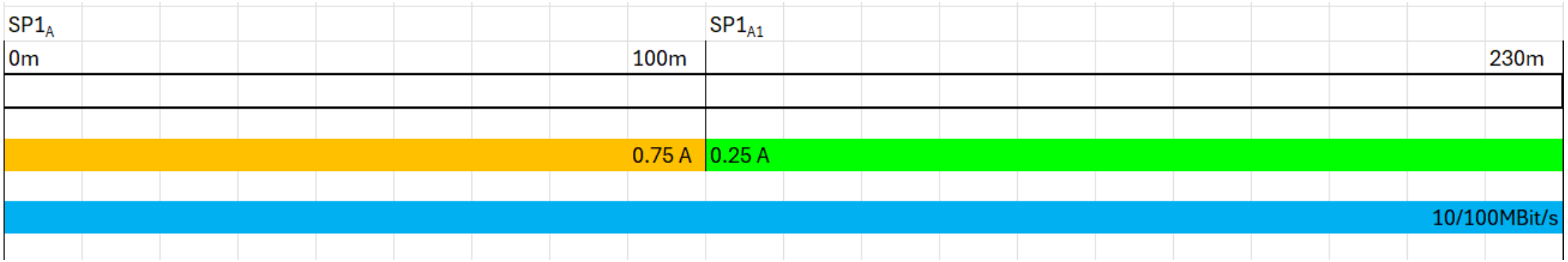
  → Lower voltage is preferred for power savings
- All other possibilities should go in an Annex

# Proposal for $SP2_A$ (AWG18)



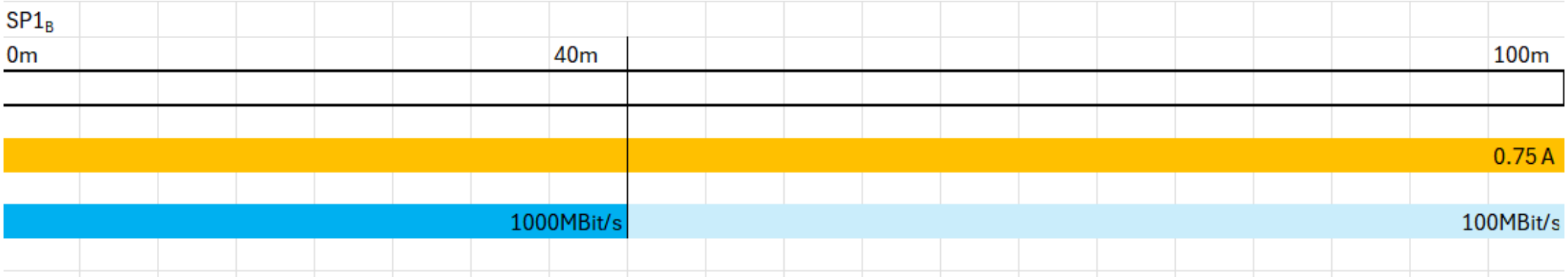

| Name | Maximum current | Maximum data rate | Maximum length |
|---|---|---|---|
| $SP2_A$ | 2.0 A | 100MBit/s | 130m |
| $SP2_{A1}$ | 0.75 A | 100MBit/s | 340m |
| $SP2_{A2}$ | 0.25 A | 10MBit/s | 590m/1000m |

# Proposal for $SP1_A$



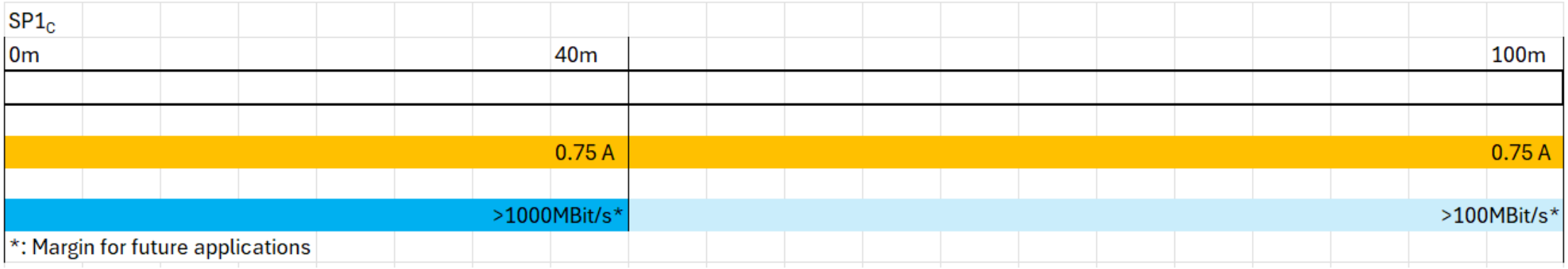

| Name | Maximum current | Maximum data rate | Maximum length |
|---|---|---|---|
| $SP1_A$ | 0.75 A | 100MBit/s | 100m |
| $SP1_{A1}$ | 0.25 A | 100MBit/s | 230m |

# Proposal for $SP1_B$




| Name | Maximum current | Maximum data rate | Maximum length |
|---|---|---|---|
| $SP1_B$ | 0.75 A | 1000MBit/s | 40m |
| $SP1_{B1}$ | 0.75 A | 100MBit/s | 100m |

# Proposal for $SP1_C$




| Name | Maximum current | Maximum data rate | Maximum length |
|---|---|---|---|
| $SP1_C$ | 0.75 A | >1000MBit/s | 40m |
| $SP1_{C1}$ | 0.75 A | >100MBit/s | 100m |

# Proposal for precalculated channels and corresponding naming

- $SP1_A$ : specified up to 60 MHz and 100 m; current carrying capacity of minimum 0,75 A, 4 connections;
- $SP1_{A1}$ : specified up to 60 MHz and 230 m; current carrying capacity of minimum 0,25 A, 4 connections;
- $SP1_B$ : specified up to 600 MHz and 100 m; current carrying capacity of minimum 0,75 A, 4 connections;
- $SP1_C$ : specified up to 1250 MHz and 100 m; current carrying capacity of minimum 0,75 A, 4 connections;
- $SP2_A$ : specified up to 60 MHz and 130 m; current carrying capacity of minimum 2 A, 4 connections;
- $SP2_{A1}$ : specified up to 60 MHz and 340 m; current carrying capacity of minimum 0,75 A, 4 connections;
- $SP2_{A2}$ : specified up to 60 MHz and 1000 m; current carrying capacity of minimum 0,25 A, 10 connections, for 10 Mbit/s transmission only.

# Discussion