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# **8023cg\_D2p2 MDI Comments**

**Long Beach, CA  
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# Scope

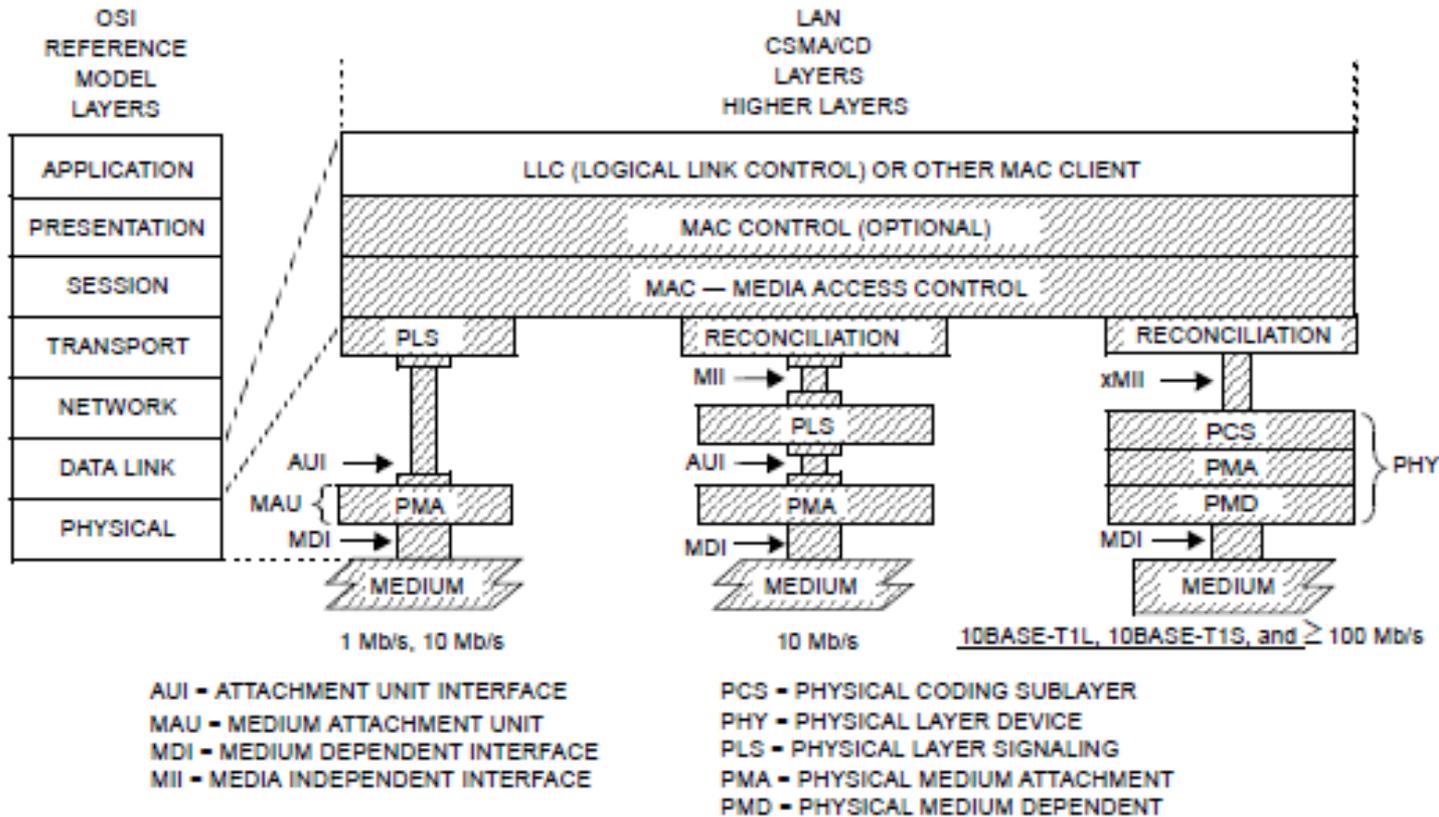
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- MDI comment response #116, #118

# IEEE Std 802.3™-2015 - MDI

- 1.4.269 Medium Dependent Interface (MDI): The mechanical and electrical or optical interface between the transmission medium and the MAU (e.g., 10BASE-T) or the PHY (e.g., 1000BASE-T) and also between the transmission medium and any associated (optional per IEEE Std 802.3, Clause 33) Powered Device (PD) or Endpoint Power Sourcing Equipment (PSE).
  
- 1.1.3.2 Compatibility interfaces: The following important compatibility interfaces are defined within what is architecturally the Physical Layer.
  - a) *Medium Dependent Interfaces (MDI)*. To communicate in a compatible manner, all stations shall adhere rigidly to the exact specification of physical media signals defined in the appropriate clauses in this standard, and to the procedures that define correct behavior of a station. The medium-independent aspects of the LLC sublayer and the MAC sublayer should not be taken as detracting from this point; communication in an Ethernet Local Area Network requires complete compatibility at the Physical Medium interface (that is, the physical cable interface).
  
- PMD is coupled to the cabling at the MDI.
  
- MDI requirements: mechanical (to ensure complete compatibility) and electrical.

# Architectural Perspectives



NOTE—In this figure, the xMII is used as a generic term for the Media Independent Interfaces for implementations of 10BASE-T1L and 10BASE-T1S and 100 Mb/s and above. For example: for 100 Mb/s implementations this interface is called MII; for 1 Gb/s implementations it is called GMII; for 10 Gb/s implementations it is called XGMII; etc.

Figure 1-1—IEEE 802.3 standard relationship to the ISO/IEC Open Systems Interconnection (OSI) reference model

# IEC 63171-1 ED1 - Scope

- This part of IEC 63171-1 Ed1 covers 2-way free and fixed high density connectors for data transmission with frequencies up to 600 MHz and with power capabilities up to 1A at 60° C, and is intended to specify the common dimensions, mechanical, electrical, signal integrity, environmental characteristics, reliability specifications and corresponding tests for these connectors.
  - No reference to MICE >> ISO/IEC TR 29106: Information technology -- Generic cabling -- Introduction to the MICE environmental classification

# IEC 61076-3-125 ED1 - Scope

- This part of IEC 61076 covers 2-way and 4-way (data/power) shielded free and fixed connectors for data transmission with frequencies up to 600 MHz and specifies the common dimensions, mechanical, electrical and transmission characteristics and environmental requirements as well as test specifications respectively.
  - No reference to MICE >> ISO/IEC TR 29106:2007 Information technology -- Generic cabling -- Introduction to the MICE environmental classification

## ANSI/TIA-568-C.0 ANNEX F (INFORMATIVE) ENVIRONMENTAL CLASSIFICATIONS

- Environmental classifications have been developed for the purpose of describing areas in which cabling is placed. The specifications of MICE include: M - mechanical; I - ingress; C - climatic; and, E - electromagnetic.
- Compatibility with the environment can be achieved with enhanced cabling components or through protection, separation or isolation.
- MICE 1 (M1I1C1E1) generally relates to environmentally controlled areas such as commercial building offices,
- MICE 2 (M2I2C2E2) generally relates to a light industrial environment and  
MICE 3 (M3I3C3E3) generally relates to an industrial environment.
- The classification for areas with mixed environments may be described by including the classification level for each variable as a subscript (e.g., M1I2C3E1).
- If a cabling system component crosses an environmental boundary, the component or mitigation technique should be selected to be compatible with the worst case environment to which it is exposed.

## Single Pair Connector Selection for SC25WG3

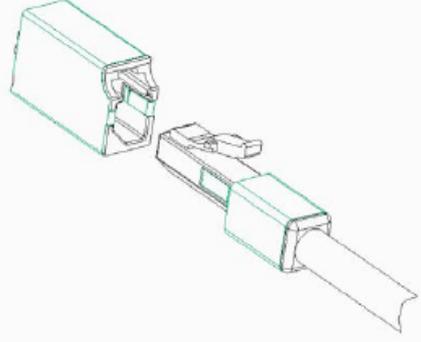
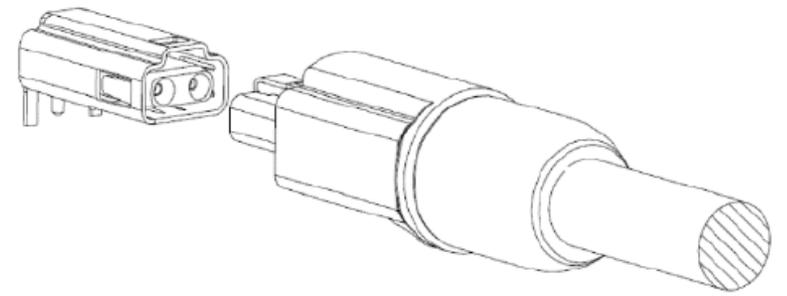
- ISO/IEC SC25 WG3 produced a questionnaire for the national committees to select Connecting hardware for single pair cabling to be used by SC25 WG3.
- The questionnaire was divided into two selections:-
  - $M_1I_1C_1E_1$  (Normal office environments).
  - $M_2I_2C_2E_2/M_3I_3C_3E_3$  (Industrial environments).
- The results of the questionnaire were circulated 27/07/2018 as
- JTC 1/SC 25/2819/RQ.

*Source: 1118\_SC25\_WG3\_report\_to\_802d3.pdf*

# ISO/IEC SC25/WG3 Liaison – November 2018

- ISO/IEC has provided IEC references that address environmental classifications.

## Single Pair Selection for SC25WG3

Environment	Standard	
$M_1I_1C_1E_1$	IEC 63171-1 (CD) Copper LC style connector for use with 1-pair balanced twisted pair cabling	
$M_2I_2C_2E_2$ $M_3I_3C_3E_3$	IEC 61076-3-125 (CD) 2-way, shielded and unshielded, free and fixed connectors for data transmission up to 600MHz with current carrying capacity Standard:	

Source: 1118\_SC25\_WG3\_report\_to\_802d3.pdf

# 802.3cg Electromagnetic Environment

- Adopt Table 97-15 electromagnetic classifications for 802.3cg baseline link segments

Table 97-15—Electromagnetic classifications Type B link segment

Electromagnetic	Minimum (dB)		
	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>
Radiated RF – AM	3 V/m at (80 MHz to 1000 MHz) 3 V/m at (1400 MHz to 2000 MHz) 1 V/m at (2000 MHz to 2700 MHz)	3 V/m at (80 MHz to 1000 MHz) 3 V/m at (1400 MHz to 2000 MHz) 1 V/m at (2000 MHz to 2700 MHz)	10 V/m at (80 MHz to 1000 MHz) 3 V/m at (1400 MHz to 2000 MHz) 1 V/m at (2000 MHz to 2700 MHz)
Conducted RF	3 V at 150 kHz to 80 MHz	3 V at 150 kHz to 80 MHz	10 V at 150 kHz to 80 MHz

- Use electromagnetic environments and separation requirements between EMI sources and metallic cabling to characterize electromagnetic noise.

Source: [http://www.ieee802.org/3/cg/public/May2017/diminico\\_01\\_0517.pdf](http://www.ieee802.org/3/cg/public/May2017/diminico_01_0517.pdf)

## Motion #11

- ***Move to adopt Table of electromagnetic classifications for the up to 1000m 802.3cg link segment baseline; slide 13 in diminico\_01\_0517.pdf.***
- ***M: C. Diminico S: S. Graber***
- ***Y: 21 N: 0 A: 7***
- **Motion Passes (Technical  $\geq$  75%)**

Source: [http://www.ieee802.org/3/cg/public/May2017/motions\\_3cg\\_01b\\_0517.pdf](http://www.ieee802.org/3/cg/public/May2017/motions_3cg_01b_0517.pdf)

# MDI comment resolution

- ISO/IEC has provided IEC connector references that address environmental classifications.
- Electromagnetics independent of MICE classification
- Remove MICE references.
- Use application descriptions instead of MICE environmental classifications.
  - MICE 1 (M1I1C1E1) generally relates to environmentally controlled areas
    - such as commercial building offices,
  - MICE 2 (M2I2C2E2) generally relates to a light industrial environment and
  - MICE 3 (M3I3C3E3) generally relates to an industrial environment.

# MDI comment resolution #116, #118

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## 146.8.1 MDI connectors

P153, L14: Replace paragraph with text below.

Connectors meeting the requirements of IEC 63171-1 (commercial building environments) or IEC 61076-3-125 (light industrial and industrial environments) may be used as the mechanical interface to the balanced cabling. The plug connector is used on the balanced cabling and the MDI jack connector on the PHY. The IEC 63171-1 plug and jack are depicted (for informational use only) in Figure 146–26 and Figure 146–27 respectively and the mating interface is depicted in Figure 146–30. The IEC 61076-3-125 plug and jack are depicted (for informational use only) in Figure 146–28 and Figure 146–29 respectively and the mating interface is depicted in Figure 146-31. The assignment of PMA signals to connector contacts for PHYs are given in Table xx.

# MDI comment resolution #116, #118

## 147.9.1 MDI connectors

P198, L51: Replace paragraph with text below.

Connectors meeting the requirements of IEC 63171-1 (commercial building environments) or IEC 61076-3-125 (light industrial and industrial environments) may be used as the mechanical interface to the balanced cabling. The plug connector is used on the balanced cabling and the MDI jack connector on the PHY. The IEC 63171-1 plug and jack are depicted (for informational use only) in Figure 147–21 and Figure 147–22 respectively and the mating interface is depicted in Figure 147–25. The IEC 61076-3-125 plug and jack are depicted (for informational use only) in Figure 147–23 and Figure 147–24 respectively and the mating interface is depicted in Figure 147-26. The assignment of PMA signals to connector contacts for PHYs are given in Table xx.