

# Clause 138.10.3 MDI

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IEEE P802.3cd

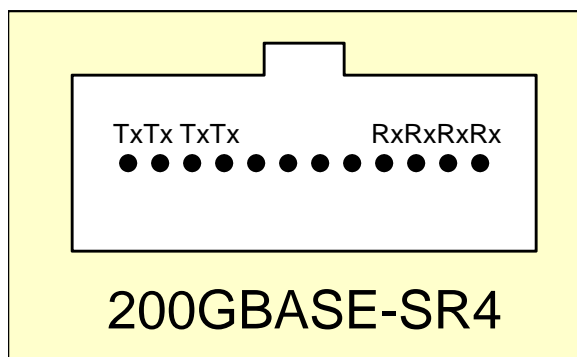
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# MDI Array Lane Assignments

- Definition required to ensure interoperability
  - Parallel optics introduce more degrees of freedom that must be constrained for interoperable connectivity
- Optimal lane assignment will be compatible with structured cabling
  - The same array polarity in cabling systems should support all array applications
    - without modification of permanent link cabling
    - with common patch cords
      - Implies common connector
- 50G-SR, 100G-SR2, 200G-SR4 each have different numbers of lanes
  - 100G-SR2 is the first instance of a 2-pair MDI
  - The others can follow existing clauses
  - Structure of clause 138.10.3 should be similar to 86.10.3
    - The latter addresses multiple MDIs (40G-SR4 and 100G-SR10)

# 200GBASE-SR4 Proposal

Looking into the MDI receptacle with the keyway on top



Follow common themes of existing 4-lane variants

Specify

- 4 transmitters on left side
- 4 receivers on right side
- 4 unused positions in center

Specify the MPO connector

- Non-angled male (pinned) in MDI receptacle
- Non-angled female (unpinned) on patch cord

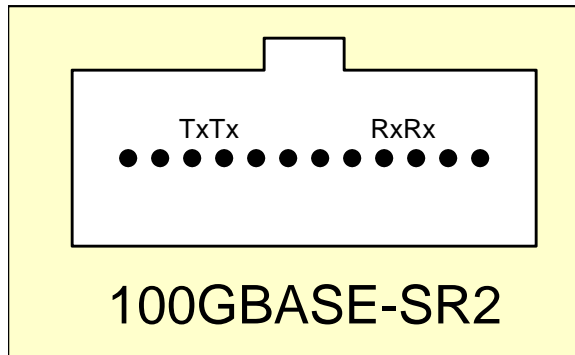
Requires same array cabling polarity as all existing 4-lane variants that transposes signals laterally

P802.3cd lane striping protocol sorts lanes at receiver

- no need to assign lane numbers, but
- assignment may be desirable for diagnostic or other purposes

# 100GBASE-SR2 Proposal

Looking into the MDI receptacle with the keyway on top



Use subset of existing 4-lane variants

Specify

- 2 transmitters on left side
- 2 receivers on right side
- 4 unused positions in center, plus
- 2 unused on left end, and 2 unused on right end
  - driven by performance considerations

Specify the MPO connector

- Non-angled male (pinned) in MDI receptacle
- Non-angled female (unpinned) on patch cord

Compatible with array polarity of TIA and ISO

P802.3cd lane striping protocol sorts lanes at receiver

- no need to assign lane numbers

# Content for Clause 138.10.3

## **138.10.3 Medium Dependent Interface (MDI)**

The PMD is coupled to the fiber optic cabling at the MDI. The MDI is the interface between the PMD and the “fiber optic cabling” (as shown in Figure 138–3).

Example constructions of the MDI include the following:

- a) PMD with a connectorized fiber pigtail plugged into an adapter;
- b) PMD receptacle.

NOTE: This is identical to the existing text in Draft1p1.

# Content for Clause 138.10.3.1

## 138.10.3.1 Optical lane assignments for 100GBASE-SR2

The two transmit and two receive optical lanes of 100GBASE-SR2 shall occupy the positions depicted in Figure 138–4 when looking into the MDI receptacle with the connector keyway feature on top. The interface contains four active lanes within 12 total positions. The four center positions and the outermost two lanes on the left and outermost two lanes on the right are unused. The transmit optical lanes occupy the remaining two position on the left. The receive optical lanes occupy the remaining two positions on the right.

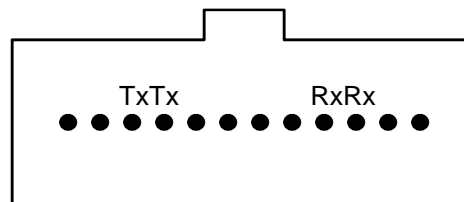


Figure 138-4 -- 100GBASE-SR2 optical lane assignments

# Content for Clause 138.10.3.2

## 138.10.3.2 Optical lane assignments for 200GBASE-SR4

The four transmit and four receive optical lanes of 200GBASE-SR4 shall occupy the positions depicted in Figure 138–5 when looking into the MDI receptacle with the connector keyway feature on top. The interface contains eight active lanes within 12 total positions. The four center positions are unused. The transmit optical lanes occupy the leftmost four positions. The receive optical lanes occupy the rightmost four positions.

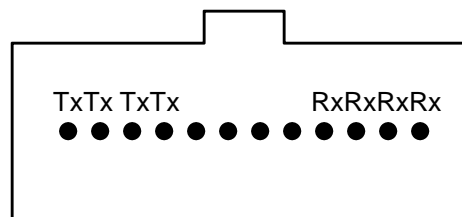


Figure 138-5 -- 200GBASE-SR4 optical lane assignments

# Content for Clause 138.10.3.3 (1 of 2)

## **138.10.3.3 Medium Dependent Interface (MDI) requirements**

The MDI shall optically mate with the compatible plug on the optical fiber cabling.

For 100GBASE-SR2 and 200GBASE-SR4 the MDI adapter or receptacle shall meet the dimensional specifications for interface 7-1-3: *MPO adapter interface – opposed keyway configuration*, or interface 7-1-10: *MPO active device receptacle, flat interface*, as defined in IEC 61754-7-1. The plug terminating the optical fiber cabling shall meet the dimensional specifications of interface 7-1-4: *MPO female plug connector, flat interface for 2 to 12 fibers*, as defined in IEC 61754-7-1.

Figure 138–6 shows an MPO female plug connector with flat interface, and an MDI.



## Content for Clause 86.10.3.3 (2 of 2)

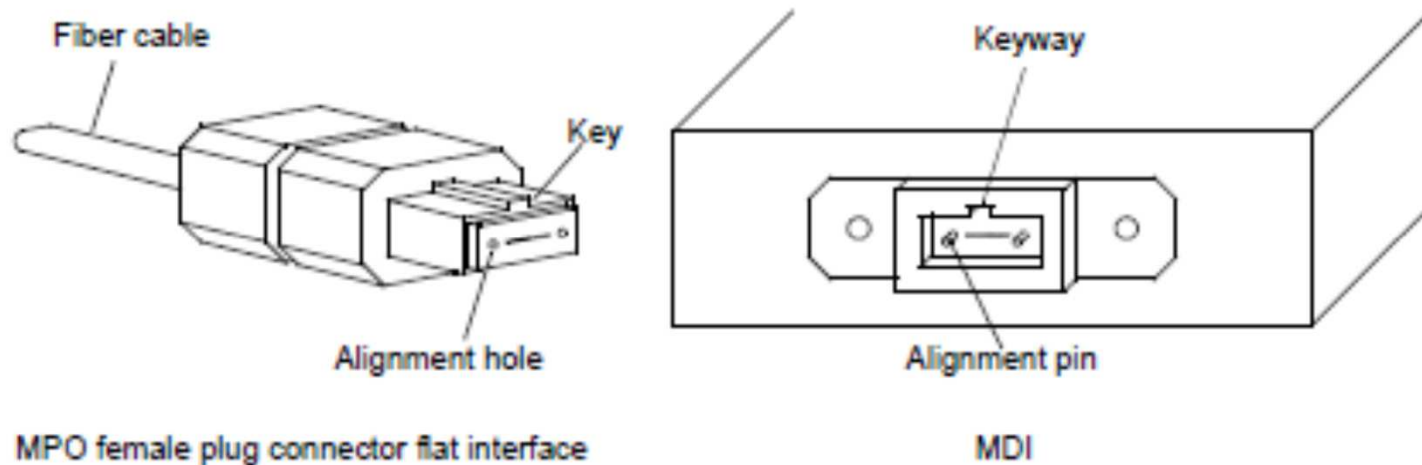


Figure 138-6 – MPO female plug with flat interface and MDI

The MDI connection shall meet the interface performance specifications of IEC 61753-1 and IEC 61753-022-2 for performance class Bm/2m.

NOTE—Transmitter compliance testing is performed at TP2 as defined in 138.5.1, not at the MDI.

Class Bm/2m:  $\leq 0.35$  dB mean loss /  $> 20$  dB return loss, random mate