# 802.3cg 10SPE TF Ad Hoc Optional MDI Discussion

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Background

- We build (at least) two types of system:
  - life of network == life of asset
    - In this case (e.g. a car, or a maybe a Process Automation "Skids"), no in place upgrades are required, and the network does not need to evolve.
    - This is often a fully engineered system, where the network is specifically designed for a specific asset or class of assets (e.g., a specific car model).
  - life of network << life of asset
    - In this case, in place upgrades over life of equipment are common/required.
    - In this case, plug and play requirements are more common, as equipment and requirements evolve over time.
- I touched on this in "Reflections of the Ad Hoc Chair (Ft Worth)"

BASE-T Plug and Play
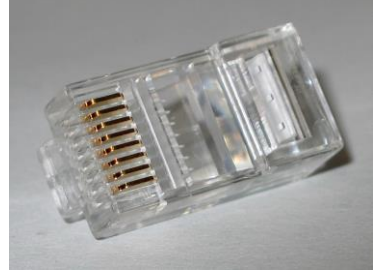
- The use of RJ45 (really 8P8C https://en.wikipedia.org/wiki/Modular_connector#8P8C) as a standard MDI for multiple generations of BASE-T (2 pair and four pair), along with the definition of the structured cabling systems from TAI has enabled systems vendors and users to seamlessly evolve products over time (including 10Mb/s->100Mb/s->1Gb/s->…..) without losing backward compatibility.

- This is a major element in building a significant viable market outside the "fully engineered systems" market segment.

- For these people, Plug and Play MATTERS!

Hallway/email discussions

- Unlike the more familiar (at least to me) BASE-T, I believe that 100/1000 BASE-T1 did not define standard or optional MDIs, deferring this choice to the individual system builder.

- This seems like a reasonable choice when you are focused on "fully engineered systems", but a pootr choice when seeking to enter a more "plug and play" market.

- If we want 10BASE-T1 to address the "plug and play" market, we need to consider defining at least one optional MDI.

- If we want to be able to build a BASE-T1 10/100/1000 ecosystem similar to the highly successful BASE-T ecosystem, "plug and play" is required

Goals for optional MDI(s)

- The following is a wish list of items that I think we should address to define optional MDI(s) for 10SPE, and enable us to better address a "plug-and-play" market.

    1. One MDI for "normal" environments (RJ45 equivalent) and one for a "harsh" environments (M12 equivalent)

    2. "binary connector" either in or out (as opposed to the screw terminal), physically robust and resistant to vibration etc.

    3. Interoperable between the harsh and normal connectors at different ends of a cable.

    4. Relatively small (~50% of 4 pair equivalent).

    5. Field termination should be possible.

    6. Support for optional power distribution techniques.

    7. Reasonable balance of cost of connector within system (different absolute numbers between normal and harsh environment connectors).

    8. Should support uses for higher speeds (e.g., 100BASE-T1, 1000BASE-T1, etc etc)

Non-Goals for optional MDI(s)

- Defining new connectors – this is "not our job"

- Addressing "Instrinsic Safety" – we need to stick to the "do not preclude", and let the IS folks do what they need to.

- Mandating that all systems have to use specific connectors – people building fully engineered system (e.g., automotive), need to have the flexibility to choose what makes sense.

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What next?

- Use the reflector to judge interest from the different groups including:
  - Automotive/industrial users, PHY/connector/cable/system vendors
- Solicit presentations/contributions from:
  - User community
  - Connector community
- Goals?
  - Define an optional MDI objective (probably should, but do we need to?)
  - Choose optional MDI baselines, and move forward.

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Thank You!