Objectives :
Greater than 10 Mb/s long-reach SPE

G. Zimmerman/ADI, APL Group, Cisco,
CommScope, Marvell, SenTekSe

(approved IEEE 802.3 3/17/22)

Basic PHY Objectives

Consensus:

1. Preserve the IEEE 802.3/Ethernet frame format at the MAC client service interface.
2. Preserve minimum and maximum frame size of the current IEEE 802.3 standard.
3. Do not preclude meeting FCC and CISPR EMC requirements
4. Support for optional single-pair Auto-Negotiation
5. Do not preclude the ability to survive industrial fault conditions (e.g., shorts, overvoltage, EMC)
6. Do not preclude working within an Intrinsically Safe device and system as defined in IEC 60079
7. Support optional Energy Efficient Ethernet optimized for Operational Technology (OT) applications, including very low power devices
8. Support fast-startup operation which enables the time from power_on=FALSE to a state capable of transmitting and receiving valid data to be less than 500ms

Speed-Specific Objectives (100 Mb/s)

Consensus:

1. Support a speed of 100 Mb/s at the MAC/PLS service interface.
2. Support 100 Mb/s single-pair Ethernet operation in industrial environments (e.g., EMC, temperature).
3. Maintain a bit error ratio (BER) at the MAC/PLS service interface of less than or equal to 10^{-10} or the frame loss ratio equivalent
4. Define performance characteristics of a link segment with a single balanced pair of conductors supporting up to 5 inline connectors for up to at least 500m reach, and a PHY supporting point-to-point full duplex operation over the link segment.
5. Specify one or more optional power distribution techniques for use in conjunction with 100 Mb/s single-pair Ethernet PHYs over one or more of the single-pair segments.