

GM'S MULTI-GIG ETHERNET OBJECTIVES

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GENERAL MOTORS

AGENDA

SPEED

Page 3

TIMING

Page 4

LINK SEGMENT

Page 5

AUTOMOTIVE ENVIRONMENT

Page 6

SPEED

10 Gbps

- Cameras
- Displays
- Data Sharing

Expect to have few, if any, needs for speeds greater than 1 Gbps but less than 10 Gbps

TIMING

Delay

- Maximum delay is 1 ms across 7 hops

Startup

- Start up must be achieved within 100 ms

LINK SEGMENT

Dimensions

- Up to 10 m in length
- Up to 2 in-line connectors

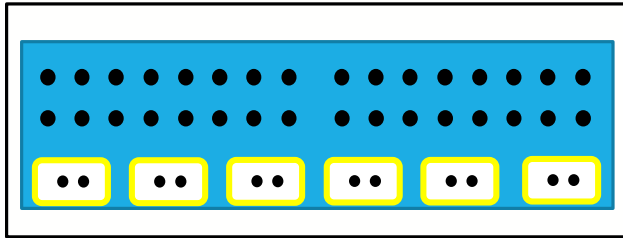
Cable type

- STP (Shielded Twisted Pair) is preferred, with one or two pairs
- Coax is generally harder to process/build
 - Dielectric insulator difficult to process
 - Braided shield is expensive and difficult to process
- Optical is generally harder to process/build
 - Cutting angle is very important
 - Ends need to be polished
 - Can't use PoE, PoDL, etc.

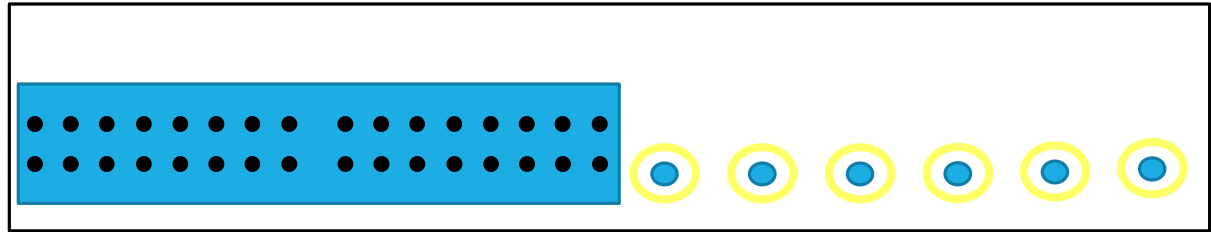
COPPER VS. OPTICAL

Some ECUs will contain switches and multiple Ethernet ports.

When copper connections are used, there is the potential to include smaller connector “mates” into the PCB mating connector. This potentially reduces the ECU size. Generally connectors can only be on one side of the ECU, sometimes on two sides.



Copper



Optical

AUTOMOTIVE ENVIRONMENT

Voltage Requirements

- http://www.ieee802.org/3/bw/public/Wienchowski_3bw_02_0914.pdf

Environmental Requirements

- See 802.3 Clause 96.9
- Max ambient temperature of 105°C

EMC Considerations

- Not all frequencies have strict Radiated Emissions limits
- Consider using frequencies whose multiples fall into these “Open” bands
- Even a 59th harmonic can be an issue if the limit line is low