



GM One Pair Ethernet Device Test Specification

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This document is the specification that defines testing of the Physical Layer and Protocol Layer requirements of One Pair Ethernet (OPEN) devices.

1.2 Applicability. This procedure applies to all GM Electronic Control Unit (ECU)s sourced with GB7401 In Vehicle Ethernet Physical Layer Specification and/or GB7411 1000BASE-T1 Ethernet Physical Layer Specification.

1.3 Remarks. This procedure describes component/single Electronic Control Unit (ECU) level tests. This procedure shall be executed by the ECU supplier at each sample delivery phase and at every software change thereafter. Test results shall be submitted to the GM Serial Data Team (serialdata.team@gm.com) for review by GM as per the Global Component Serial Communication Process described in the Appendix of the Statement of Requirements (SOR).

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

None

2.3 Additional References.

- CG3689, GM One Pair Ethernet (OPEN) devices Validation Test Procedure - Component Level
- ECU Functional Requirements Specification
- Electrical and Software Issues Management System (ESIMS)
- GB5450, Global B Active Safety Ethernet Communication Strategy Specification
- GB5481, Global B Central Gateway Module Ethernet Deployment Specification
- GB5482, Global B EOCM HCP Ethernet Deployment Specification
- GB5483, Global B HDLM Ethernet Deployment Specification
- GB6006, Diagnostic Client Specification
- GB7401, In_Vehicle_Ethernet_Physical_Layer_Specification
- GB7411, 1000BASE-T1_Ethernet_Physical_Layer_Specification
- GIS-610, Ethernet Audio/Video Bridging (AVB) Network Management for Infotainment
- GIS-611, Functional Service Architecture
- GIS-612, Network Interface Configuration for Infotainment
- GIS-618, Infotainment 3 System State Specification
- Problem Resolution Tracking System (PRTS)

- Statement of Requirements (SOR) (Appendix describing the Global Component Serial Communication Process)

3 Resources

3.1 Facilities. Testing shall be performed at the supplier facility using a bench that allows communication between the test tools and the ECU being tested.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment. The minimum required set of equipment to perform this test procedure includes:

3.2.1 Unless otherwise specified, the ECU being tested shall be powered by a direct current (DC) power supply at 12.5 V. This need not be an independent supply (i.e., it could be used to supply power to other devices in the test setup) unless specifically noted in the test procedure.

3.2.2 GM recommended hardware and software as needed for automation and simulation.

3.2.3 A high-end oscilloscope with differential probes and the supporting software; measurement equipment for voltage and current.

3.2.4 A computer capable of running the GM recommended automation and simulation.

3.2.5 A table listing the required hardware and software for automation and simulation, including part numbers, is listed in CG3689.

3.3 Test Vehicle/Test Piece. A representative ECU flashed with the applicable software version for testing.

3.4 Test Time.

Calendar time: 10 d to 15 d

Test time: 80 h to 100 h

Coordination time: 20 h

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills.

3.6.1. Familiarity with Ethernet serial data communications protocol, physical layer, and tool set.

3.6.2. Familiarity with ECU component functionality.

4 Procedure

4.1 Preparation. As described for each individual test listed in CG3689.

4.2 Conditions.

4.2.1 Environmental Conditions. Conditions must be consistent with those specified in the ECU Functional Requirements Specification.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 The supplier shall execute all tests that are applicable to the ECU type being tested.

4.3.2 Each test in CG3689 contains a reference to the implementation requirement that is being tested. Suppliers are strongly recommended to use the GM provided automation and simulation if provided to perform component verification of Ethernet communications and hardware requirements. The latest version of recommended hardware and software may be necessary to run the automation and simulation. Additional equipment is necessary for Physical Layer testing. If the Supplier chooses not to use this approach, it may be required to demonstrate that test tool hardware and software have equal or better characteristics.

4.3.2.1 In order to obtain the automated scripts, the supplier is to:

- Register on GM Supply Power at GM Supply Power (<https://gmsupplypower.covisint.com/web/portal/home>).
- Notify GM of registered person.

© Copyright 2019

July 2019

Page 2 of 4