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AVT-716 - 8192 UART Mode

The AVT-716 Interface unit is capable of connecting to and communicating with several different vehicle networks *(not simultaneously)*. Among them is the GM 8192 UART or ALDL network. This document describes the hardware required and some notes on using the AVT-716 in the 8192 UART mode.

Introduction

Prior to the adoption of J1850 VPW mode (also known as Class 2) GM used an in-vehicle network known as 8192 UART or ALDL (Assembly Line Diagnostic Link).

Hardware Requirements

The AVT-716 is equipped with the firmware on-board to facilitate communications with an 8192 UART bus. AVT-716 hardware revision "E" also incorporates the necessary physical layer transceiver. (Previous revisions of hardware require the addition of a separate board to provide the physical layer transceiver.)

Connection of the AVT-716 interface unit to the 8192 UART bus is accomplished through a previously unused pin on the AVT-716 unit/enclosure.

8192 UART connection is on enclosure connector P1 pin #9.

All other pins on enclosure connector P1 are unchanged and are as documented in the manual. The same 8192 UART connection is on AVT-716 board #2, connector P3 pin #2.

Firmware Operations

Once the AVT-716 hardware is properly configured to connect to an 8192 UART bus, the AVT-716 unit is switched to UART mode through the $E1 $BB command. When you issue the $E1 $BB command you should receive the $91 $0E response to indicate the unit has switched to 8192 UART mode and is now ready for operations.

Detailed information on the UART mode commands and responses can be obtained from the "Master Commands and Responses" document that is available for downloading (in PDF format) from our web site.

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Message Structure

There are two important differences between the messages that may exist on a J1850 bus and those that may exist on the 8192 UART bus. These are detailed here because they affect operations between the host computer and the AVT-716 interface unit.

1. UART messages may be longer than 15 bytes. This presents a problem with the use of the header byte in which the lower nibble indicates the number of bytes to follow.
   Solution: Communications between the host and AVT-716 interface unit that contain messages to or from the bus are of the form:
   $11 $xx $aa $bb $cc ...
   where: $11 is the header byte to indicate it is a message to or from the bus.
   $xx is the count of the number of bytes to follow.
   $aa $bb $cc ... are the actual message bytes.

2. UART messages contain a byte in the message that indicates length of the message data field. This is an important byte as both the AVT-716 and the other nodes on the bus use this byte to detect the end of a bus message.
   All UART bus messages are of the form:

   <Msg. ID> <Msg. Length> <Function mode> <data byte 1> ... <data byte n> <Checksum>

   The message length byte is a count of the number of bytes to follow itself, excluding the checksum byte, with $55 added.

   Note that the AVT-716 unit will calculate the Checksum byte and append it to the end of the message. The AVT-716 unit will not alter the contents of the message length byte. Do not confuse the <Msg. Length> byte with the header byte(s).

Examples

A. Host wants to send a message out onto the bus. The bus message is to be:
   $F1 $57 $01 $02 + checksum.
   Explanation:
   $F1: Message identification byte.
   $57: Message length byte = $55 + 2 for the next two bytes.
   $01: A message byte.
   $02: Another message byte.

B. To send this message, the host sends the following to the AVT-716 unit:
   $11 $04 $F1 $57 $01 $02
   Explanation:
   $11: Indicates that a bus message follows.
   $04: Indicates that four bytes follow.
   The actual message bytes follow.

C. When the AVT-716 gets this from the host it computes the checksum byte, adds it to the end of the message, and then transmits the message onto the bus.

D. The AVT-716 receives every message it transmits and checks it for errors. When the entire message is transmitted and received properly the AVT-716 will send the host only the received status byte.
(If desired, the AVT-716 will send the entire received message back to the host, refer to the $5x $06 command.)

E. The AVT-716 sends the host the following:
$11 $01 $60
Explanation:
$11: Indicates that a bus message follows.
$01: Indicates that one byte follows.
$60: Indicates that the message was transmitted by this node and completed successfully.
(Refer to the Received Status Byte definitions in the Manual and the Master Guide.)

F. When the AVT-716 receives a message from the bus it computes the checksum, compares it to the last byte received, discards the last byte, prepends a received status byte, a length byte, and the header byte.

G. The following message occurs on the bus:
$F1 $58 $22 $4B $C7 + checksum

H. The AVT-716 will send the following message to the host:
$11 $06 $00 $F1 $58 $22 $4B $C7
Explanation:
$11: Indicates a message from the bus.
$06: Indicates that 6 bytes follow.
$00: Indicates that no errors were detected and the message was not from this device. The actual message bytes follow.