

4 September 2003

AVT-718 SDM-AOS Support

This document describes the so - called “SDM” mode of operation for the AVT-718 unit. SDM mode support was first released in AVT-718 firmware version 4.7.

Introduction

SDM mode was developed to support a customer requirement. To the best of our knowledge it is known as SDM-AOS communications and is the subject of GM document: “CM 20324”.

SDM-AOS communications use a Master - Slave relationship. The AVT-718 SDM mode permits operation of the AVT-718 as either a Master or a Slave.

Hardware

SDM mode uses the UBP / LIN resources on the AVT-718 interface board.

SDM mode requires the following hardware:

- Modify an AVT-718 revision “G” board to revision “L” configuration.
- Install an AVT-718X add-on board.

It is recommended that the modifications for the SDM upgrade be completed by the factory.

Firmware

AVT-718 firmware version 4.7 provides SDM support.

A set of commands and responses for SDM mode is provided at the end of this document.

SDM Mode Commands and Responses

A list of commands and responses for SDM mode are provided at the end of this document. All commands and responses for all of our interface units is available in the document: “Master Commands and Responses.”

The document is available from our web site, Product Documentation page.

<http://www.avt-hq.com/download.htm>

Note: Unless otherwise indicated, numbers in this document are hex.

SDM Parameters

The following is a summary of SDM mode.

- Single wire (ground referenced).
- The SDM bus signal is routed to AVT-718 P3 “Network” connector pin #1.
- Bus line idles low (ground state) and is active at a nominal +7 vdc.
- The physical layer uses a Class 2 transceiver.
[Note: This mode is NOT Class 2, it just uses that transceiver.]
- UART based signaling (start bit; 8 data bits, LSB to MSB; parity bit; one stop bit).
- Default baud rate is 10400 baud.
- The data and parity, as seen on the bus wire, is upside down with respect to the referenced document. The user does not need to know this since the AVT-718 handles all polarity issues.
- A Master node only transmits single byte commands.
- The Slave node has only two responses.
- The Slave node response is either 1 or 14 bytes.
- The Slave node always appends a complete set of bytes inverted from the original response. (In other words, the two responses from the Slave are either 2 or 28 bytes in length.)
- The AVT-718 automatically checks and strips the inverted bytes from a received message.
- The AVT-718, as a Slave, automatically appends the inverted bytes to the end of a message to be transmitted to the network.

The AVT-718 implementation of SDM mode permits the user to modify many of the operational and timing parameters. Refer to the Commands and Responses section of this document and/or to the Master Commands and Responses document posted on our web site.

Operation

SDM mode is entered by issuing the mode switch command: \$E1 \$77.

The expected response is: \$91 \$1B.

The default settings for SDM mode should be compatible with and for communications with an AOS module.

Once connected, the AVT-718 is always ‘listening’ to the network. All network messages are received and passed to the host.

Master and Slave Communications

When transmitting a message onto the network the user specifies to the AVT-718 whether the message is to be handled as a Master or a Slave.

Examples:

- Master: 0x 00 rr ss tt ...
x = number of bytes to follow.
00 = send message as Master. No inverted bytes are appended.)
rr ss tt ... actual message bytes.
- Slave: 0x 01 rr ss tt ...
x = number of bytes to follow.
01 = send message as Slave. (Inverted bytes are appended.)
rr ss tt ... actual message bytes.

Communication Examples

Using the AVT-718 as a Master, sending the “Request for Status from AOS #1” command byte \$00 elicits a one byte Status response from the AOS module.

Status request

Command, sent to AVT-718:

02 00 00

Receive from AVT-718, transmit acknowledgement.

01 60

Receive from AVT-718, response from AOS #1.

02 00 54

A status report of \$54 means:

AOS #1

indicator state = 0

suppression system #1 malfunction code = 101

suppress for empty seat

Using the AVT-718 as a Master, sending the “Request for Traceability/Verification Data from AOS #1” command byte \$08 elicits a 14 byte response from the AOS module.

Traceability/Verification Data request

Command, sent to AVT-718:

02 00 08

Receive from AVT-718, transmit acknowledgement.

01 60

Receive from AVT-718, response from AOS #1.

0F 00 54 43 30 30 38 38 31 33 31 38 D0 52 42 30

The reader should consult the controlling document to decode this response. Note that the byte listing in the controlling document is organized last byte to first byte, left to right (backwards from the byte order as they are received).

Timing Parameters

Nearly all protocol time parameters can be changed by the user. Each of the parameters have been assigned a name and a command to query for status or change the parameter. Refer to the Commands and Responses section.

AVT-718 SDM Mode - Commands

High nibble, bits b7 - b4: Command type.

0: Message for transmission onto the network.

0x 0y rr ss tt ...

x = count of bytes to follow.

y = 00 when a Master. (Master; inverted bytes are not appended.)

y = 01 when a Slave. (Slave; inverted bytes are automatically appended.)

rr ss tt ... = message bytes.

1: Alternate header format

Alternate header format for transmit messages not supported in SDM mode.

2: Reset.

21 01: Reset HBCC.

21 02: Reset SCC.

21 03: Reset DLC.

21 04: Reset FIFO #1.

21 05: Reset FIFO #2.

21 06: Reset CAN.

3: _____

4: _____

5: Operational commands.

51 01: Status request, forwarding of inverted bytes.

52 01 00: Suppress forwarding of inverted bytes. {Default}

52 01 01: Forward the inverted bytes.

51 04: Request 'Periodic' message.

5x 04 xx yy ...: 'Periodic' message. {Default: Off}

51 05: Clear 'Periodic' message.

- 51 06: Request status of transmit echo.
52 06 00: Suppress messages 'from this device.' {Default}
52 06 01: Forward network messages 'from this device.'
- 51 08: Request message time stamp status.
52 08 00: No time stamp. {Default}
Msg order: Header byte(s) - Status byte - msg. byte (MSB) - . . . - msg. byte (LSB)
52 08 01: Include time stamp. Four bytes. 1.0 microsecond resolution.
Msg order: Header byte(s) - Time (MSB) - Time() - Time() - Time (LSB) - Status byte - msg. byte (MSB) - . . . - msg. byte (LSB).
- 51 09: Request network loading message status.
52 09 00: Suppress network loading reports. {Default}
52 09 01: Send network loading reports every specified interval.
- 51 0A: Request network loading report interval.
55 0A ww xx yy zz: Network loading report interval.
{Default = \$07 A1 20 = 500 000 microseconds}
Interval range = 1 to \$00 FF FF FF microseconds.
- 51 16: Timer alert status query.
52 16 00: Timer alert disabled.
52 16 01: Timer alert enabled.
- 51 17: Timer alert period query.
52 17 xx: Timer alert period. xx - period in 0.0625 second increments.
{Default = \$10 = 1 sec.}
- 51 18: Timer query. Timer rollover: \$00 FF FF FF.
- 51 27: Query for interbyte time.
55 27 vv ww xx yy: Set the interbyte time, in microseconds.
1 microsecond increments. Range = 1 to \$00 FF FF FF
microseconds.
{Default = \$00 00 01 F4 = 500 usec}
- 51 2B: Query for buffer expiration time.
55 2B vv ww xx yy: Set the buffer expiration time, in microseconds.
1 microsecond increments. Range = 1 to \$00 FF FF FF
microseconds.
{Default = \$00 00 09 C4 = 2,500 usec; at 10.4 kbaud.}
- 51 40: Transmit acknowledgements status query.
52 40 00: Disable transmit acknowledgments.
52 40 01: Enable transmit acknowledgments. {Default}

51 4A: Query for 'Periodic' message interval.
55 4A vv ww xx yy: Set the 'Periodic' message interval time, in microseconds.
1 microsecond increments. Range = 1 to \$00 FF FF FF
microseconds.
{Default = \$00 01 86 A0 = 100,000 usec.}

51 4F: Query for baud rate.
52 4F 01: Baud rate = 10.4 kbaud. {Default}
52 4F 02: Baud rate = 1.2 kbaud.

6:

7:

8:

9: Processor memory.

96 01 msb xx yy lsb zz: Processor write memory (byte), value = zz.
96 02 msb xx yy lsb zz: Processor read memory (byte), count = zz.
97 03 msb xx yy lsb rr ss: Processor write memory (word), value = rr ss.
96 04 msb xx yy lsb zz: Processor read memory (word), count = zz.

A:

B: Firmware version.

B0: Request firmware version number.

C:

D: Operational mode.

D0: Request operational mode report.

E: Mode switch.

- E1 22: Switch to UBP mode. [91 14]
- E1 33: Switch to VPW mode. [91 07]
- E1 44: Switch to LIN mode. [91 19]
- E1 66: Switch to KIE mode. [91 1A]
- E1 77: Switch to SDM mode [91 1B]
- E1 96: Switch to FLASH programming mode. [91 2E]
- E1 99: Switch to CAN mode. [91 10]
- E1 CC: Switch to PWM mode. [91 06]
- E1 DD: Switch to KWP 2000 mode. [91 0F]

F: Re-Start.

- F1 A5: Reset and restart.

AVT-718 SDM Mode - Responses

High nibble, bits b7 - b4: Response type.

0: Message received from the network.

0x ss yy zz ... x = count of bytes to follow; ss - receive status byte; yy zz ... message bytes.

1: Message received from the network; alternate header formats.

11 tt ss yy zz ... tt = count of bytes to follow; ss - receive status byte; yy zz ... message bytes.

12 rr tt ss yy zz ... rr tt = count of bytes to follow; ss - receive status byte; yy zz ... message bytes.

2: Error message.

See complete list in section: "Error Codes."

3: Command error.

31 xx: xx = Header byte of message in error.

4:

5:

6: Operations reports.

62 01 00: Inverted bytes of received messages are not forwarded to the host.

62 01 01: Inverted bytes of received messages are forwarded to the host.

6x 04 xx yy ...: 'Periodic' message.

- 61 05: 'Periodic' message length = 0, deleted.

- 62 06 00: Disable forwarding network messages 'from this device.'
- 62 06 01: Enable forwarding network messages 'from this device.'

- 62 08 00: Message time stamps are disabled.
- 62 08 01: Message time stamps are enabled.

- 62 09 00: Network loading messages are enabled..
- 62 09 01: Network loading messages are disabled.

- 65 0A ww xx yy zz: Network loading message time interval in microseconds.

- 63 0F xx yy: Network loading report.

- 62 16 00: Timer alert disabled.
- 62 16 01: Timer alert enabled.

- 62 17 xx: Timer alert period. xx = period in 0.0625 sec. increments.

- 65 18 vv ww xx yy: Timer value in microseconds. Rollover = \$00 FF FF FF.

- 65 27 rr ss tt vv: Interbyte time: rr ss tt vv microseconds.

- 65 2B rr ss tt vv: Buffer expiration time: rr ss tt vv microseconds.

- 62 40 00: Transmit acknowledgments disabled.
- 62 40 01: Transmit acknowledgments enabled. {Default}
- 65 4A rr ss tt vv: 'Periodic' message interval: rr ss tt vv microseconds.

- 62 4F 01: Baud rate = 10.4 kbaud.
- 62 4F 02: Baud rate = 1.2 kbaud.

7:_____

8:_____

9: Board status information.
See complete list in section: "Board Status Information."

A:_____

B: _____

C: _____

D: _____

E: Processor memory.
 Ex msb xx xx lsb yy . . .

Processor memory status for address specified.

F: _____

Receive Status Byte

	<u>7</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
SDM		From this node.	Success	Lost arbitration.		Odd message length.	Parity error.	Inverted verification error.

Questions ??

Contact the factory by e-mail, phone, or fax.
 Contact information provided on the bottom of page 1.