NAV-TV

INTERFACING THE FUTURE

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GM IOS/IOT AVB to RCA, SPDIF & TosLink sound processor

NTV-KIT955

Overview

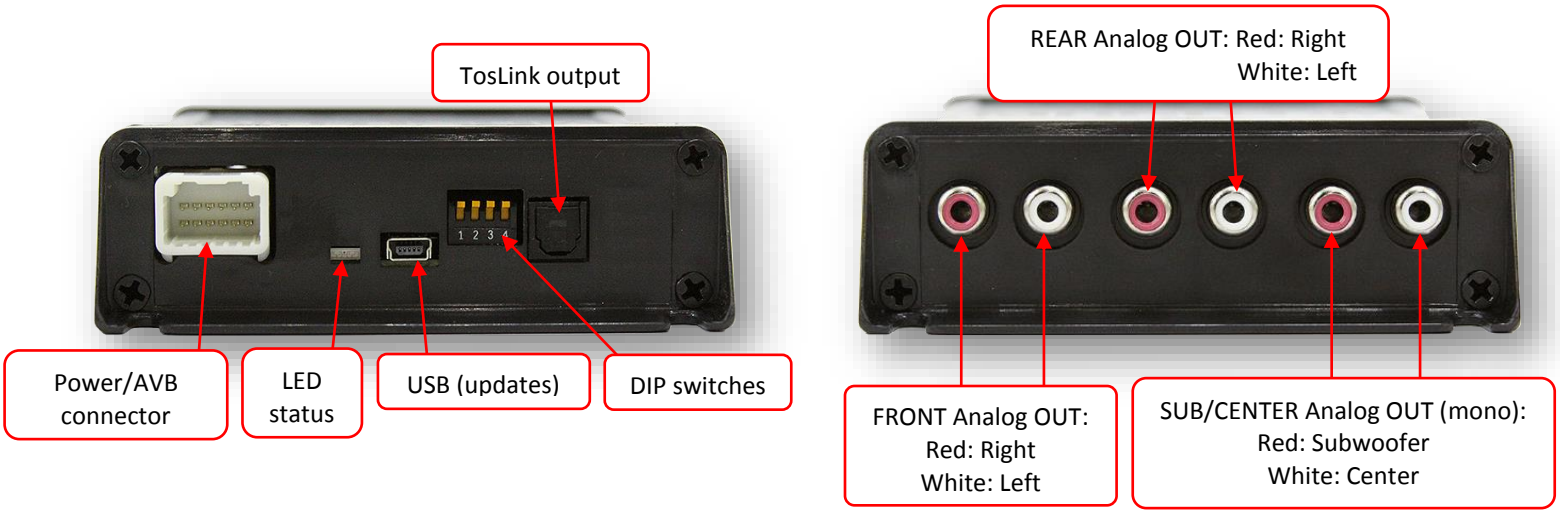
NAV-TV's AVB-GM processor seamlessly converts GM's AVB bus to low level (6 channel) RCA or TOSLink outputs. Adding an aftermarket amplifier to the OE BOSE IOS/IOT system will never be so easy or seamless. This plug & play kit integrates with various OEM data networks to retain OnStar, door chimes, volume control, full fade and balance (analog only), treble, mid-range, bass control & Bluetooth voice calls with no external speaker (true OEM integration). *NOTE: the OEM amplifier must be removed (or disconnected) from the vehicle to maintain proper functionality.*

Kit Content

USB Cable (updates)
NTV-CAB009

ZEN AVB-GM
Interface
NTV-ASY273

AVB-GM overview



ZEN AVB-GM Compatibility
(IOS, IOT radio with BOSE only)

Year(s)	Make	Model
2017+	Cadillac	CTS, ATS, CT6
2019+	Cadillac	ANY (except Escalade)
2019+	Chevy	Camaro, Silverado 1500
2019+	GMC	ANY (except Yukon)

IMPORTANT NOTE: Many GM vehicles have poor chassis grounding. BEFORE connecting this interface, check the GROUND to the amplifier using a digital multimeter. If resistance (reference vehicle's battery negative) is greater than 1 OHM, run amp ground directly to battery or find a better ground source. Warranty will be VOID for the AVB-GM if damage is caused due to faulty ground(s).

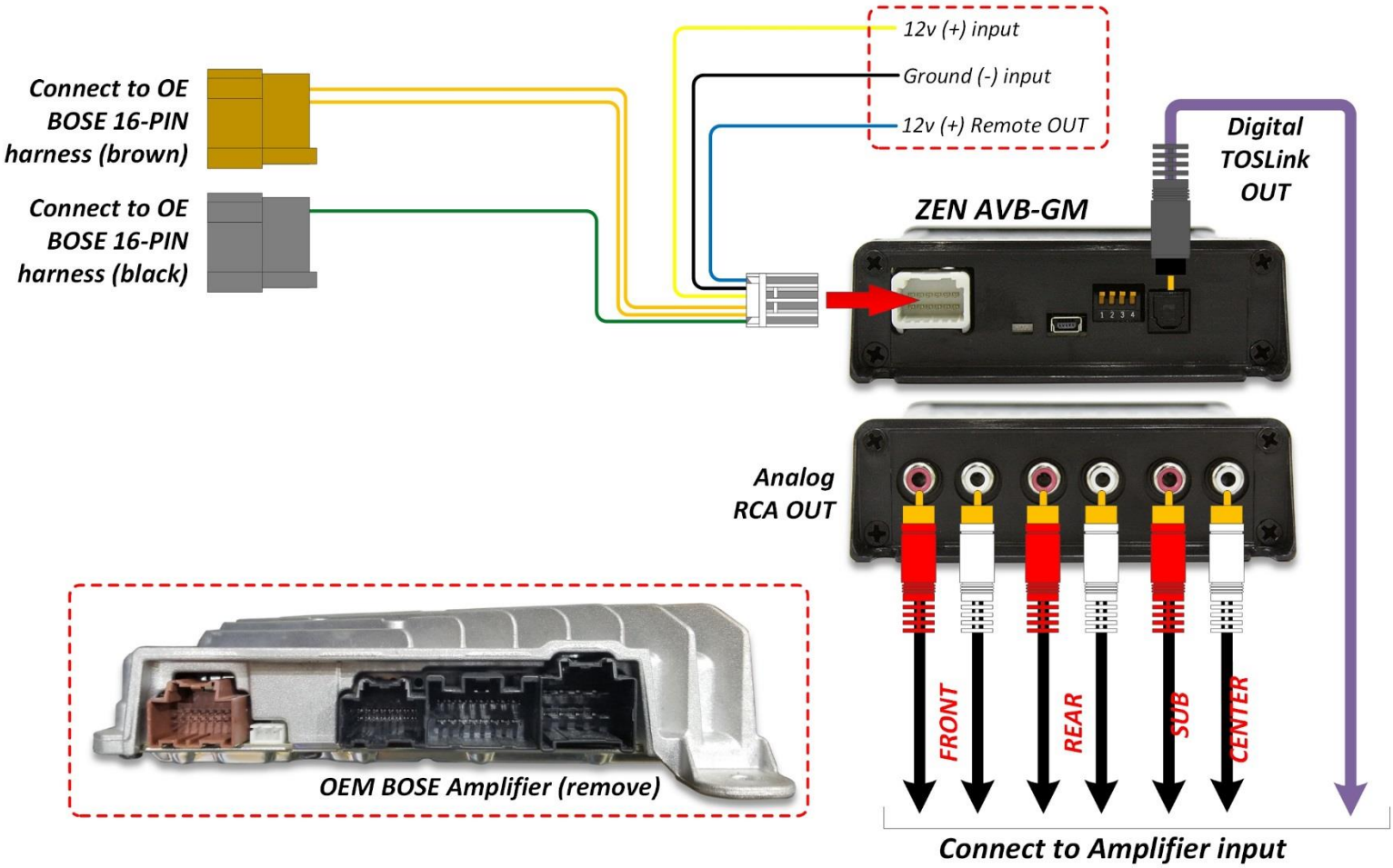
AVB-GM Installation

*Proper connection for the AVB-GM requires locating the OEM **amplifier.** Known locations are listed on the chart below:*

Vehicle	Radio Tuner Location
Cadillac ATS/CTS/XTS/XT4	Trunk, passenger side panel
Cadillac CT6	Trunk, driver's side floor
Cadillac XT5	Driver under-dash, right of gas pedal
Chevy Camaro	Trunk, driver's side floor
Chevy Blazer, Equinox	Underneath front of center console
Chevy Corvette	Trunk floor, left of rear fuse block
Chevy Colorado	Behind Glovebox
Chevy Silverado/GMC Sierra	Behind rear seat, below rear window
GMC Acadia, Terrain	Underneath front of center console

IOS/IOT OEM BOSE amplifier

NOTE: to avoid noise, connect power/ground with aftermarket amplifier power/ground



AVB-GM Installation

1. Use the chart on page 3 to locate the OEM amplifier. Access the amplifier and remove all plugs.

2. Connect the provided 16-PIN connectors (brown & black) to the previously removed 16-pin plugs from the OE amplifier. The other connectors connected to the OE BOSE amp contain OE speaker wires. See pin-outs (page 6-7) to use for aftermarket amplification, if desired.

3. ***Before connecting power to the AVB-GM,*** adjust dip-switch settings for the desired options:

Position	DIP 1	DIP 2	DIP 3	DIP 4*
UP/OFF	--*NA*--	Full Scale output (0 dB)	*OEM BASS adjustment* controls overall BASS frequencies	Loudness OFF
DOWN/ON	--NA--	-6 dB output	*OEM BASS adjustment* controls SUB output directly	Loudness ON

4. If using analog RCAs to connect to the amplifier, connect FRONT, REAR, SUB/Center to RCA connectors as shown on page 2. *WARNING: Do not connect RCA cables to this interface until all amplifiers/external processors are properly grounded. Failure to do this may cause damage to the interface and VOID the warranty!*
5. If using TosLink for signal to the amplifier, connect fiber cable to TosLink connector shown on page 2. *NOTE: both Analog and Digital output sound simultaneously, regardless of which type is used.*
6. Use the provided ***blue wire*** (extend) for amplifier turn on. ***NOTE: this wire must be used for amp turn on, instead of ACC as the amplifier(s) must wake before ignition (for door chimes, etc).*** *This wire will output 12v (500mA MAX) whenever a door is unlocked (via remote) or opened (data-sensing). Make certain this wire will not short circuit anywhere as it will have power any time the vehicle network is active. NOTE: if using remote to turn on more than 1 amplifier/processor, use a relay to boost current.*

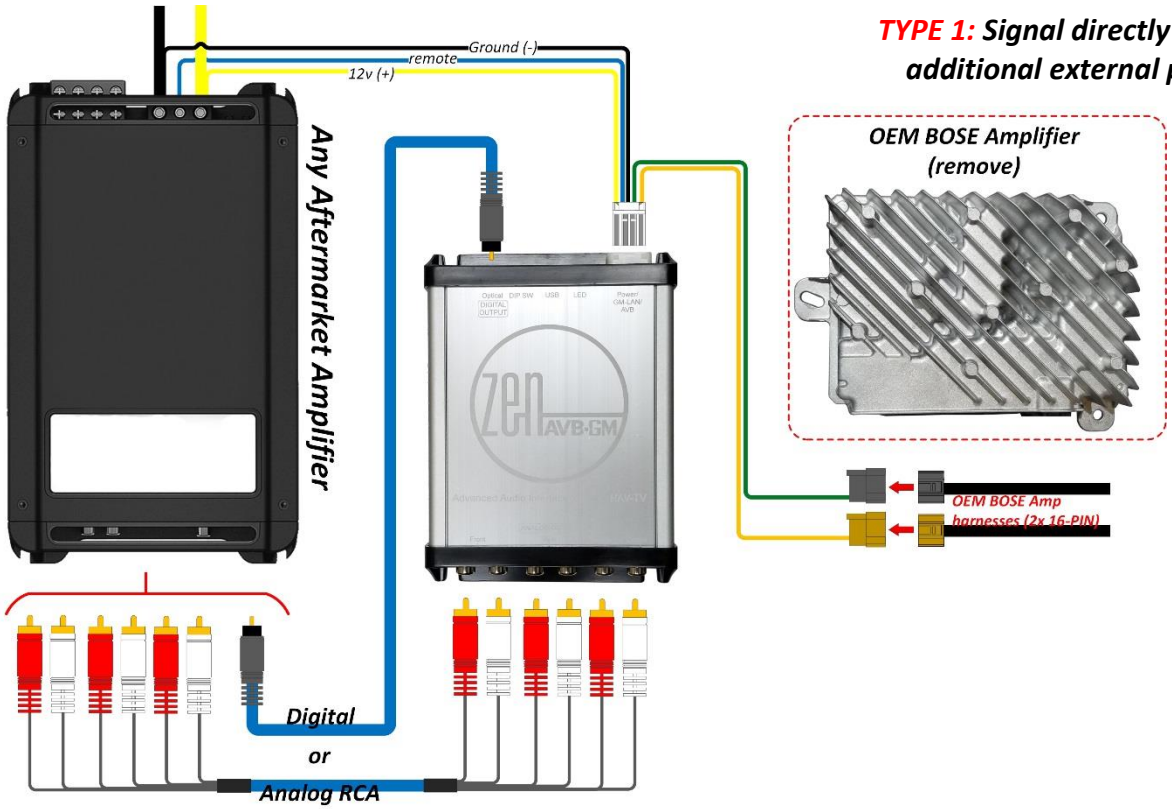
Multi-Color LED Status Indication

LED Status	Indication
Solid Red	AVB Active *only (missing GM-LAN)*
Solid Green	GM-LAN Active *only (missing AVB Ethernet)*
Red + Green	**AVB & GM-LAN Active (normal operation) ***
Violet or White	*AVB traffic commands…*
Blinking Red	*Peaking* (maximum digital signal level achieved)
Blinking Blue	PC Link with app (future use)
Blinking Green	USB update

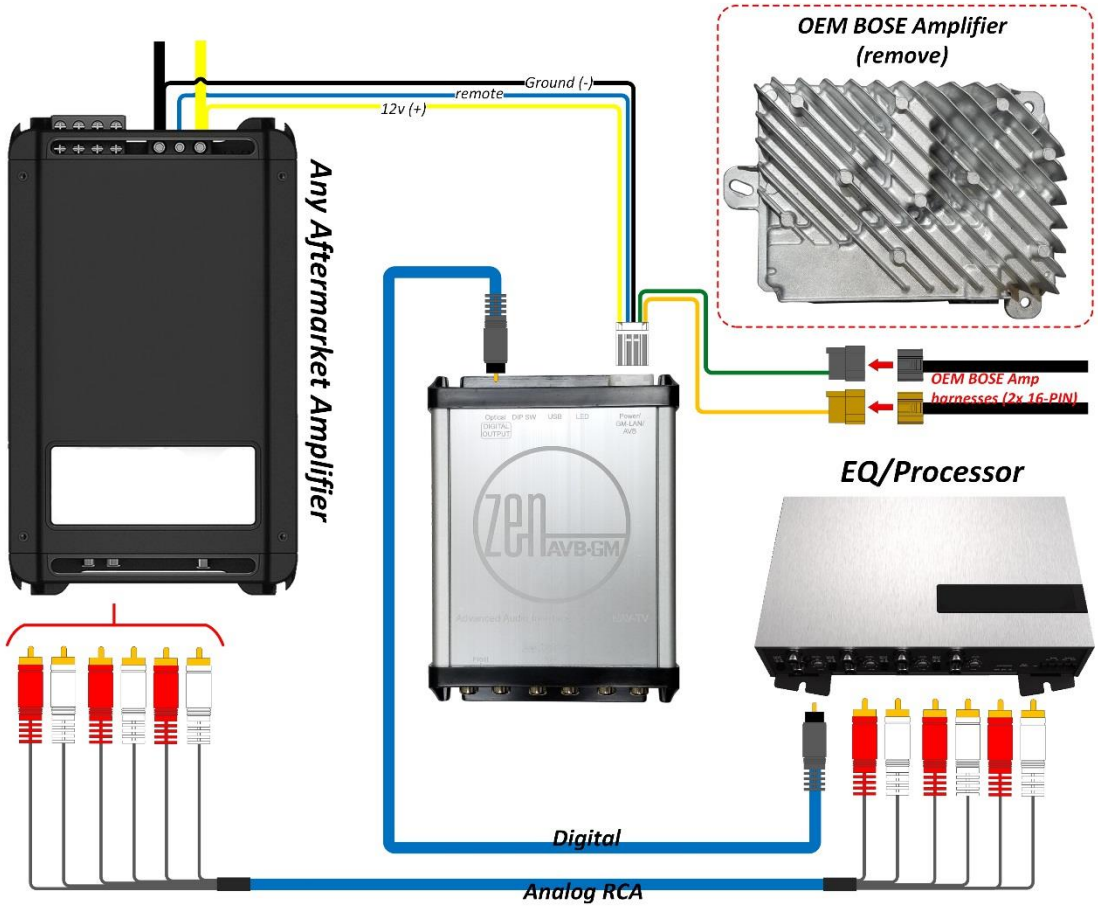
**unless receiving a radio command (volume change, etc)*

AVB-GM System Layout Options

***TYPE 1:** Signal directly to amp, no additional external processor*

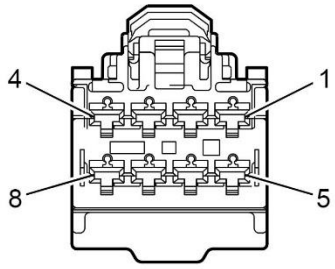


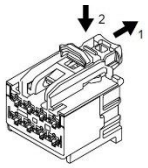
***TYPE 2:** Signal to additional external processor, then to amplifier*

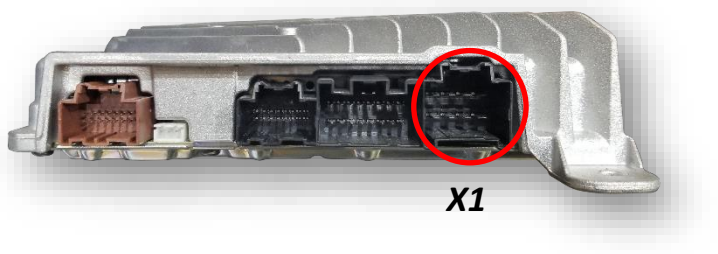


OEM BOSE Amp Pin-Outs

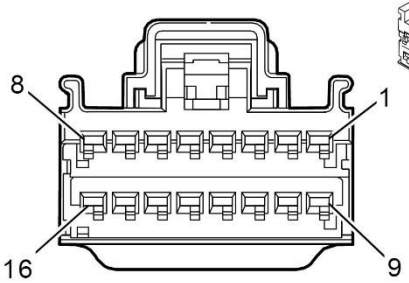
Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 1	(1) BU/GY	(1) 346	(1) Left/Rear Subwoofer Speaker Control (+)	(1) I	(1) –
(2) 2	(2) 1.5	(2) YE	(2) 200	(2) Right Front Speaker Control (+) 1	(2) I	(2) –
(3) 3	(3) 1.5	(3) BU	(3) 201	(3) Left Front Speaker Control (+) 1	(3) I	(3) –
(4) 4	(4) 3	(4) RD/YE	(4) 3740	(4) Battery Positive Voltage	(4) I	(4) –
(5) 5	(5) 1	(5) GN/BK	(5) 1794	(5) Left/Rear Subwoofer Speaker (-) Low Reference	(5) I	(5) –
(6) 6	(6) 1.5	(6) YE/BK	(6) 117	(6) Right Front Speaker Signal (-) 1	(6) I	(6) –
(7) 7	(7) 1.5	(7) BN/BU	(7) 118	(7) Left Front Speaker Signal (-) 1	(7) I	(7) –
(8) 8	(8) 3	(8) BK/WH	(8) 1851	(8) Signal Ground	(8) I	(8) –

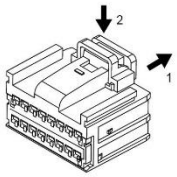


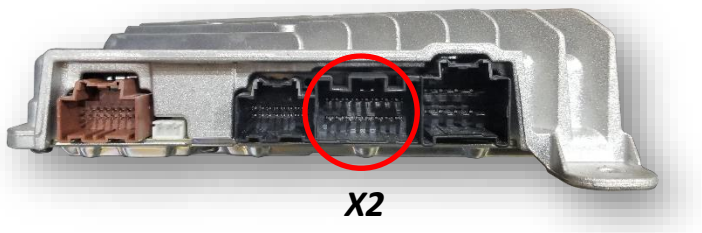




Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.5	(1) BU/VT	(1) 1857	(1) Left Front Midrange Speaker Control (+)	(1) I	(1) –
(2) 2	(2) 0.75	(2) BN/BK	(2) 1975	(2) Right Front Speaker (-) 2 Low Reference	(2) II	(2) UQA
	(2) 0.75	(2) YE/GN	(2) 1855	(2) Right Rear Midrange Speaker Control (+)	(2) I	(2) UQS
(3) 3	(3) 0.5	(3) BU/VT	(3) 1874	(3) Left Front Speaker Control (+) 2	(3) I	(3) UQA
	(3) 0.5	(3) YE/BN	(3) 1859	(3) Left Rear Midrange Speaker Control (+)	(3) I	(3) UQS
(4) 4	(4) 0.75	(4) BN/GN	(4) 1852	(4) Right Front Tweeter Speaker Control (+)	(4) I	(4) UQA
	(4) 0.75	(4) WH	(4) 46	(4) Right Rear Speaker Control (+)	(4) I	(4) UQS
(5) 5	(5) 0.5	(5) YE/BU	(5) 1856	(5) Left Front Tweeter Speaker Control (+)	(5) I	(5) UQA
	(5) 0.5	(5) GN	(5) 199	(5) Left Rear Speaker Control (+)	(5) I	(5) UQS
(6) 6	(6) 1	(6) WH	(6) 46	(6) Right Rear Speaker Control (+)	(6) I	(6) UQA
	(6) 0.5	(6) YE/GN	(6) 1855	(6) Right Rear Midrange Speaker Control (+)	(6) I	(6) UQS
(7) 7	(7) 1	(7) GN	(7) 199	(7) Left Rear Speaker Control (+)	(7) I	(7) UQA
	(7) 0.5	(7) YE/BN	(7) 1859	(7) Left Rear Midrange Speaker Control (+)	(7) I	(7) UQS
(8) 8	(8) 0.75	(8) YE/WH	(8) 1860	(8) Front Center Speaker Control (+)	(8) I	(8) UQA
	(8) 1.5	(8) VT/GN	(8) 5756	(8) Center Console Speaker Control (+)	(8) III	(8) UQS
(9) 9	(9) 0.5	(9) BU/BN	(9) 1957	(9) Left Front Midrange Speaker (-) Low Reference	(9) I	(9) –
(10) 10	(10) 0.75	(10) GY/BU	(10) 1955	(10) Right Rear Midrange Speaker (-) Low Reference	(10) I	(10) UQA
	(10) 0.75	(10) GN/BU	(10) 1875	(10) Right Front Speaker Control (+) 2	(10) I	(10) UQS
(11) 11	(11) 0.5	(11) WH/BK	(11) 1959	(11) Left Rear Midrange Speaker (-) Low Reference	(11) I	(11) UQA
	(11) 0.5	(11) GY/BK	(11) 1974	(11) Left Front Speaker (-) 2 Low Reference	(11) II	(11) UQS
(12) 12	(12) 0.75	(12) VT/BN	(12) 1952	(12) Right Front Tweeter Speaker (-) Low Reference	(12) I	(12) UQA
	(12) 0.75	(12) BU/BK	(12) 115	(12) Right Rear Speaker Signal (-)	(12) I	(12) UQS
(13) 13	(13) 0.5	(13) YE/GY	(13) 1956	(13) Left Front Tweeter Speaker (-) Low Reference	(13) I	(13) UQA
	(13) 0.5	(13) GN/BK	(13) 116	(13) Left Rear Speaker Signal (-)	(13) I	(13) UQS
(14) 14	(14) 1	(14) BU/BK	(14) 115	(14) Right Rear Speaker Signal (-)	(14) I	(14) UQA
	(14) 0.5	(14) GY/BU	(14) 1955	(14) Right Rear Midrange Speaker (-) Low Reference	(14) I	(14) UQS
(15) 15	(15) 1	(15) GN/BK	(15) 116	(15) Left Rear Speaker Signal (-)	(15) I	(15) UQA
	(15) 0.5	(15) WH/BK	(15) 1959	(15) Left Rear Midrange Speaker (-) Low Reference	(15) I	(15) UQS
(16) 16	(16) 1.5	(16) BN/BU	(16) 5766	(16) Console Center Speaker (-) Low Reference	(16) III	(16) UQA
	(16) 0.75	(16) BU/YE	(16) 1960	(16) Front Center Speaker (-) Low Reference	(16) I	(16) UQS

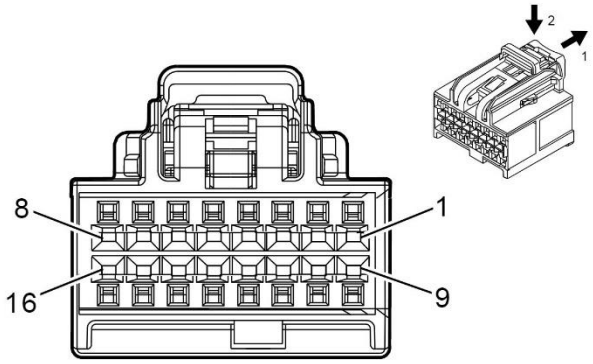


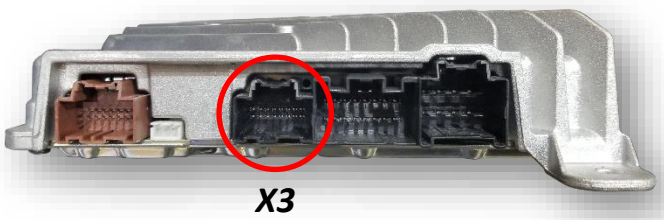




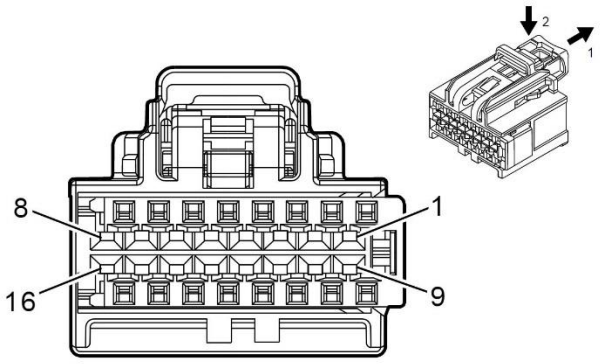
OEM BOSE Amp Pin-Outs

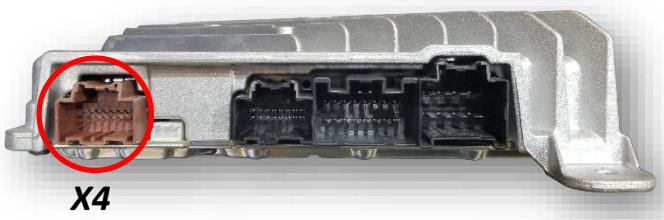
Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) GY/GN	(1) 1102	(1) Low Speed GMLAN Serial Data #2	(1) I	(1) –
2 - 3	–	–	–	Not Occupied	–	–
(4) 4	(4) 0.35	(4) GN/BN	(4) 3005	(4) Noise Reduction Microphone 1 Signal	(4) I	(4) –
(5) 5	(5) 0.35	(5) BU/YE	(5) 3006	(5) Noise Reduction Microphone 2 Signal	(5) I	(5) –
(6) 6	(6) 0.35	(6) GY/BU	(6) 3007	(6) Noise Reduction Microphone 3 Signal	(6) I	(6) –
7 - 11	–	–	–	Not Occupied	–	–
(12) 12	(12) 0.35	(12) GN/BK	(12) 3008	(12) Noise Reduction Microphone 1 Low Reference	(12) I	(12) –
(13) 13	(13) 0.35	(13) BU/BK	(13) 3009	(13) Noise Reduction Microphone 2 Low Reference	(13) I	(13) –
(14) 14	(14) 0.35	(14) GY/BN	(14) 3010	(14) Noise Reduction Microphone 3 Low Reference	(14) I	(14) –
15 - 16	–	–	–	Not Occupied	–	–





Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
(1) 1	(1) 0.35	(1) WH/BU	(1) 5986	(1) Serial Data Communication Enable	(1) I	(1) –
2	–	–	–	Not Occupied	–	–
(3) 3	(3) 0.35	(3) WH	(3) 7215	(3) Ethernet Bus 6 (+)	(3) I	(3) –
(4) 4	(4) 0.35	(4) BU	(4) 7214	(4) Ethernet Bus 6 (-)	(4) I	(4) –
5 - 6	–	–	–	Not Occupied	–	–
(7) 7	(7) 0.35	(7) WH/GN	(7) 1305	(7) High Speed GMLAN Serial Data (-)9	(7) I	(7) –
(8) 8	(8) 0.35	(8) WH/GN	(8) 1305	(8) High Speed GMLAN Serial Data (-)9	(8) I	(8) –
9 - 14	–	–	–	Not Occupied	–	–
(15) 15	(15) 0.35	(15) BU/GN	(15) 1304	(15) High Speed GMLAN Serial Data (+)9	(15) I	(15) –
(16) 16	(16) 0.35	(16) BU/GN	(16) 1304	(16) High Speed GMLAN Serial Data (+)9	(16) I	(16) –





AVB-GM Technical Specifications	
Hardware & Software	
Current HW version:	Version 1.0
Current SW version:	ZEN-AVBGM-1.1-7-11-13-19.enc
Compatible SW (update) OS:	Windows 7 (64 bit), 8, 10
INPUT	
Digital Input	AVB, GM-LAN
OUTPUT	
Digital Outputs:	TosLink
Digital Outputs supported:	24bit/48kHz
Frequency Response (digital):	18Hz – 24kHz
Analog Outputs:	6 channels (RCA)
Output Voltage *Peak:*	3v (peak to peak, with EQ flat) or 6v (selectable)
Output Voltage *RMS:*	2.1v
Analog Output Type:	Single-Ended
S/N Ratio (analog):	112dB
Frequency Response (analog):	18Hz – 24kHz
THD+N @ -1dBFS	-93dB
DAC	192kHz 32bit
DSP	128bit/Channel Floating Point
Delay (Time Alignment)	*none*
Power Supply	
Current Consumption Stand-by	<1 mA
Current Consumption Operational	350 mA MAX
Operational Voltage	7V – 20V DC
Amp Turn-On Output	Automatic
Amp Turn-On Voltage	V-batt
Amp Turn-On Current Limitation	500mA
Other	
Dimensions:	4”x5”x1 3/8”
Weight:	10 oz
Country of Origin:	USA

- *Before beginning tuning process (especially with external EQ/Processors), set all HU settings <u>for each source</u> to flat.*
- ***Tuning tips:***
    1. Before beginning tuning process (especially with external EQ/Processors), set Bass & Treble on the head unit <u>for each source</u> to flat (0).
    2. *Begin with amplifier/EQ gains all the way **down.***
    3. *With dynamic music playing, adjust the radio volume to <u>maximum</u>.*
    4. *Adjust the amplifier/EQ gains to <u>desired maximum</u> level.*
- *All doors should be closed during tuning and vehicle should be in Park (gear) to avoid alerts from door chimes/front or rear sensors, etc.*

AVB-GM Pin Out

Pin #	Description	Color
1	*--Empty--*	--
2	*--Empty--*	--
3	*--Empty--*	--
4	GM-LAN	Green
5	*--Empty--*	--
6	Ground (-)	Black
7	AVB TX (+)	Orange
8	AVB TX (-)	White/Orange
9	*--Empty--*	--
10	*--Empty--*	--
11	Remote OUT	Blue
12	12v Batt (+)	Yellow

NTV-HAR310
Wire Side

FAQ

- For installations with this AVB processor, make certain that any added amplifier's *ground* resistance (reference vehicle battery ground) ***does not exceed 1 ohm.***
- *NOTE: for Bluetooth media source, max volume occurs around 75%.* ***This is a factory limitation*** *and the ZEN AVB-GM duplicates this.*
- If you've installed a third-party DSP (receiving signal from the AVB-GM, before the amplifier) and you're having issues with *audio bleeding from one channel to another, echoing Bluetooth phone calls or any other signal processing issues,* ***rule out the AVB-GM first by temporarily bypassing the third-party DSP and running signal directly from the AVB-GM to the amplifier(s) and verify the problem still exists before calling technical support.***

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REGISTERED COMPANY ISO 9001 SGS