FlexSpeak™
A-VAM401-A
Voice Annunciator Module
Installation Instructions

Introduction

The FlexSpeak module announces audio messages upon triggers from 8 discrete inputs or 56 virtual inputs for a total of 64 audio messages. The module functions as a LIN slave, and the 56 virtual inputs are triggered through a LIN protocol by a LIN master device. These audio messages can be configured through the FlexSpeak Programming Utility GUI with options for message priority, frequency, and output method. Messages can be played directly on the integrated speaker of FlexSpeak, on a PA system, or both. FlexSpeak is equipped with an interface to allow audio playback through the vehicle's speakers through a PA system installed on the vehicle.

Messages must be recorded according to the following:

- MP3 file format
- 48kHz maximum sample rate
- 320kbps maximum bit rate

When all audio messages and configuration have been loaded onto the microSD card, it is inserted into a slot on the side of the FlexSpeak module. Ensure the microSD card is fully inserted into the slot. There is also a volume control knob and the port for the InterMotive Download Cable on the side of the module. In order to remove the microSD card, simply push it again, using a small object if necessary, and it should eject.

NOTE: The microSD card must be inserted with the contacts facing down. If the card is inserted upside down then it may become stuck in the connector or break the connector.

Insert with contacts facing down

Installation Instructions

Disconnect vehicle battery before proceeding with installation

WARNING
Disconnect the battery to prevent setting a check engine light.

It is the installer's responsibility to route and secure all wiring harnesses where they cannot be damaged by sharp objects, mechanical moving parts and high heat sources. Failure to do so could result in damage to the system or vehicle and create possible safety concerns for the operator and passengers.

It is important to avoid placing the module where it could encounter strong magnetic fields from high current cabling connected to motors, solenoids, etc. Also avoid radio frequency energy from antenna's or inverters near the module. Finally, avoid high voltage spikes in vehicle wiring by always using diode clamped relays when installing upfitter circuits.

FlexSpeak Module

Locate a suitable location to mount the FlexSpeak module near the driver position. Drill a 1 3/4" hole at the mounting location to allow for harness routing. Do not mount the module until testing is completed and all wire harnesses are routed and secure.

Connecting FlexSpeak harnessing

2-Pin power pinout definition

- **Hot-In-Run**, Pin #1, Red—Connect this pin to the vehicle's Hot-In-Run power connection.
- **Ground**, Pin#2, Black—Connect this pin to vehicle ground.
- **Mating connector**—Molex Mini-Fit Jr. 39012020

8-pin Input connector pinout definition

- See schematic on page 8 for connector pinout
- **Mating connector**—Molex Mini-Fit Jr. 39012080
- **Input 1**, Pin #1, PINK/BLACK—(+12V-activated input). This signal is referred to as Input 1. The module will play the audio message associated with Input 1 upon receiving a +12V trigger.
- **Input 2**, Pin #2, WHITE/BLACK—(+12V-activated input). This signal is referred to as Input 2. The module will play the audio message associated with Input 2 upon receiving a +12V trigger.
- **Input 3**, Pin #3, GREEN/BLUE—(+12V-activated input). This signal is referred to as Input 3. The module will play the audio message associated with Input 3 upon receiving a +12V trigger.
- **Input 4**, Pin #4, BLUE/WHITE—(+12V-activated input). This signal is referred to as Input 4. The module will play the audio message associated with Input 4 upon receiving a +12V trigger.
- **Input 5**, Pin #5, BROWN/BLACK—(+12V-activated input). This signal is referred to as Input 5. The module will play the audio message associated with Input 5 upon receiving a +12V trigger.
- **Input 6**, Pin #6, WHITE/ORANGE—(+12V-activated input). This signal is referred to as Input 6. The module will play the audio message associated with Input 6 upon receiving a +12V trigger.
- **Input 7**, Pin #7, ORANGE/BLACK—(Ground-activated input). This signal is referred to as Input 7. The module will play the audio message associated with Input 7 upon receiving a ground trigger.
- **Input 8**, Pin #8, YELLOW/BLACK—(Ground-activated input). This signal is referred to as Input 8. The module will play the audio message associated with Input 8 upon receiving a ground trigger.

Note: These connections must be made using solder and heat shrink.

4-Pin LIN Connector

- The LIN connector can be used to connect the FlexSpeak module to a LIN master, such as the PRPC in the InterMotive Flex Tech system. This connection provides the module with LIN commands to trigger 56 virtual inputs to the FlexSpeak.
- See schematic on page 8 for connector pinout definition.
- **Mating connector**—TE Connectivity AMPMODU MTE 104257-3

PA System Connector

FlexSpeak can play audio messages over its internal speaker, over the vehicle speakers, or both. This output audio option is set on a message by message basis using the FlexSpeak Programming Utility software application.

- A Red (Audio +) and a Black (Audio -) wire are provided that can be connected to an external PA.

Configuration

The FlexSpeak system contains a configuration file on the microSD card which allows the user to choose a specific track to be played for each of the 64 input triggers (8 discrete inputs and 56 LIN virtual inputs). Any of these values can be modified with the FlexSpeak Programming Utility software. This software will allow the user to reconfigure the module as desired. The configuration file should be stored in a folder labeled "Config" on the microSD card to be inserted in the module. **Note: Only one configuration file can be stored in the Config folder at any given time. Make sure to properly remove the SD card from the PC before use in the VAM module. To properly remove the SD card: Right Click the media and select Eject.**

The following parameters are available for modification in the FlexSpeak Programming Utility:

- **Input Message Priority** - Each input trigger is associated with a message priority to allow for prioritization of audio playback. By default, each input is assigned to the lowest message priority (Priority 4) and can be changed to a higher priority if required. Priority 1 is the highest priority. In the case of simultaneous input triggers or of an input trigger event during playback of another message, the messages will be placed in a prioritized queue. The module will play each message in the queue in order of priority on a first-in first-out (FIFO) basis, with a one-second delay between messages. If a Priority 1 message is received while another message of a lower priority is being played, FlexSpeak will cancel playback of the lower priority message and begin playing the Priority 1 message immediately.

- **Audio Message Playback Options** - Each input trigger has an associated playback setting to control how often the message is played upon receipt of an input trigger.

  - **One time per trigger event**—The message will be played one time on a trigger event.

  - **Repeat 10 seconds after message ends**—The message will be continuously added to the message playback queue while the trigger is active, with a 10-second delay between messages. If other input triggers become active during the 10-second delay, the audio message of that input will be played.

  - **Repeat 30 seconds after message ends**—The message will be continuously added to the message playback queue while the trigger is active, with a 30-second delay between messages. If other input triggers become active during the 30-second delay, the audio message of that input will be played.

  - **Continuously while trigger is active**—The message will be continuously added to the message playback queue while the trigger is active, with a one-second delay between messages. If other input triggers become active while the continuous trigger is active, the module will play the audio messages on a First In– First Out basis, in order of priority.

- **Input Message Audio Output** - Each input has an associated audio output option to control whether the message should be played over the PA system only, the module's self-contained speaker only, or both.

- **Input Message Track ID** - Each input is associated with a specific audio message to play upon a trigger event. The specific audio message to be played upon a trigger event can be changed with this option. All audio messages are stored in a folder titled "Playlist" on the microSD card and have a naming convention and file location that must be adhered to. Each audio file must follow the naming convention "Trk####" in order to be located and played. For example, if the Track ID for Input 1 is 0001, the module will play "Trk0001.mp3" which is located in the "Playlist" folder. By default, each input is configured to play the Track ID of the same number (Input 1 plays "Trk0001," Input 2 plays "Trk0002," etc.) Inputs 1-8 are mapped to the eight discrete inputs on the module and Inputs 9-64 are mapped to the 56 virtual LIN inputs to the module.

Configuration Continued

- **PA System Volume Control** - The volume control knob on the module controls the volume of the module's self-contained speaker only. The volume of audio playback over the PA system is stored as a configurable value on the module and can be adjusted in the FlexSpeak Programming Utility GUI as necessary.

Serial Terminal I/F Option

The module's configuration settings can also be viewed with the use of an InterMotive Download Cable and a terminal program such as TeraTerm. The settings for the terminal program are as follows:

Baud rate: 57600, **Data**: 8 bit, **Parity:** None, **Stop:** 1 bit, **Flow control:** None

To view the module's current configuration, plug in the InterMotive download cable into the module and a laptop, and power up the module. Then, in the terminal window, **type "param"** to view the module's current configuration.

SD Card File System

The module's microSD card stores all of the audio messages to be played during trigger events. The module expects the microSD card to be formatted with the FAT32 file system (pre-installed on the microSD card that comes with the module). The module can accept microSDSC and microSDHC cards, but it cannot accept microSDXC cards as they are usually formatted with the exFAT file system which is not supported.

All audio messages are stored in a folder titled "Playlist" which should be located in the root directory of the microSD card. The "Playlist" folder also contains a file titled "Default InterMotive Playlist.txt" that contains a list of all default messages stored on the SD card and a description of what the message announces when played.

Diagnostics:

FlexSpeak has a diagnostic mode to assist users in diagnosing potential issues. To enter diagnostic mode, simply turn the volume control knob on the module from minimum volume to maximum volume three times within a 10 second window.

During diagnostic mode, the module will print diagnostic information to a laptop screen using a terminal program. These messages are designed to assist the user in determining whether the module is properly receiving input triggers and whether or not the module can find the appropriate track stored on the microSD card.

Additionally, the module is designed to announce a diagnostic message if it cannot find the appropriate track on the microSD card, or if another issue is encountered during playback.

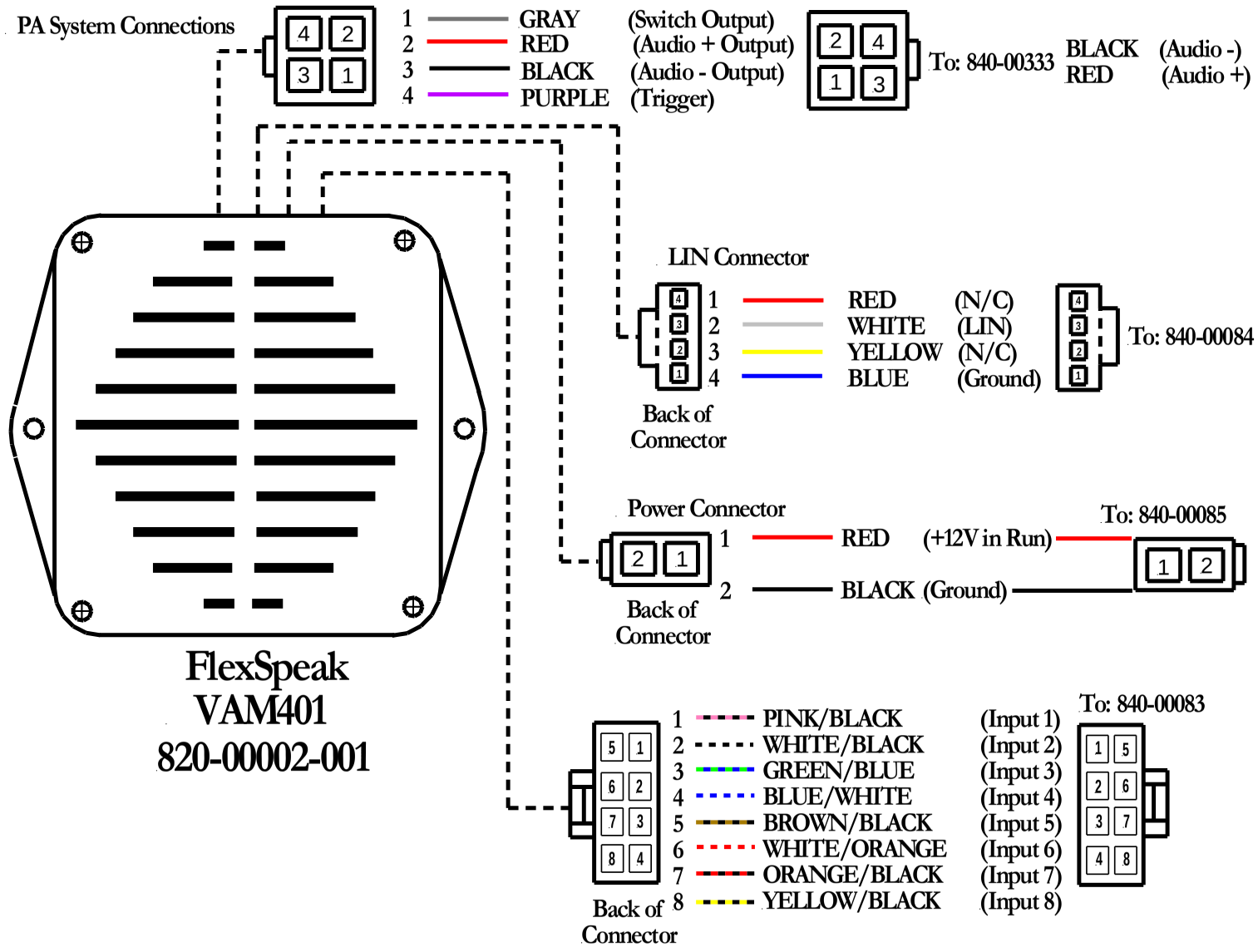
The diagnostic messages that will be announced upon an error include the following:

- "SD card" - announced when a microSD card is not present, or not fully seated
- "Input" - announced when the module receives a proper discrete input trigger, but cannot play back the associated audio message. For example, if a specific track does not exist in the playlist folder and its associated input trigger becomes active, the module will announce "Input." This will let the user know that the module is properly receiving the input trigger but cannot locate the audio message file.
- "LIN" - announced when the module receives a proper virtual LIN input trigger, but cannot play back the associated audio message.

Post-Installation Operational Test

- After all connections have been made, and the microSD card has been configured with the desired audio messages and installed in the module, turn the vehicle's key to the RUN position to power the module. Activate one of the inputs and ensure that audio is being played through the appropriate speakers.
- If the input is configured to be played over the module's self-contained speaker and the audio is not heard, check the volume control knob and ensure it is not turned to minimum volume.
- If the input is configured to be played over the vehicle's speakers (PA) and the audio is not heard, ensure that the input's configuration settings are set to play over the PA system speakers. If so, check the module's PA system volume setting. The setting ranges from 0% (lowest volume) to 100% (highest volume). Ensure that the 12V relay control output from FlexSpeak is properly connected to the PA system.
- If audio is still not playing over the vehicle's speakers, double check the PA system connections between the vehicle's speakers and the radio. You can test the vehicle's speakers by playing the vehicle's radio as normal.

Once the module has passed the post-installation operational test, permanently mount the module in the desired location.



Submit product registration at www.intermotive.net

If the FlexSpeak fails any step in the Post-Installation Test, review the installation instructions and check all connections.
If necessary, call InterMotive Technical Support at (530) 823-1048.