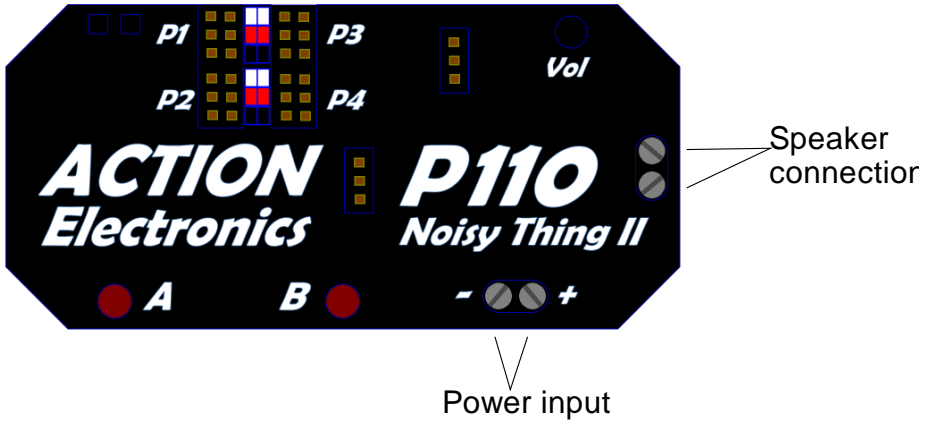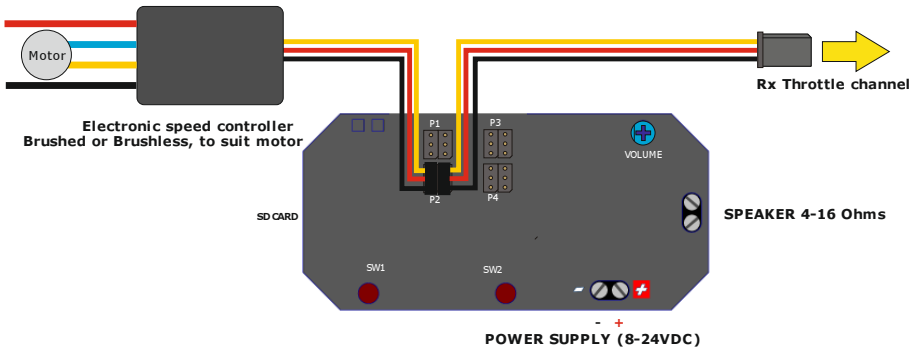# ACTION ELECTRONICS

P110 Operating Instructions

1. Quick Start Guide

Your P110 comes fully programmed & ready to go, there is no set-up required – although for more detailed setup refer to section 2.
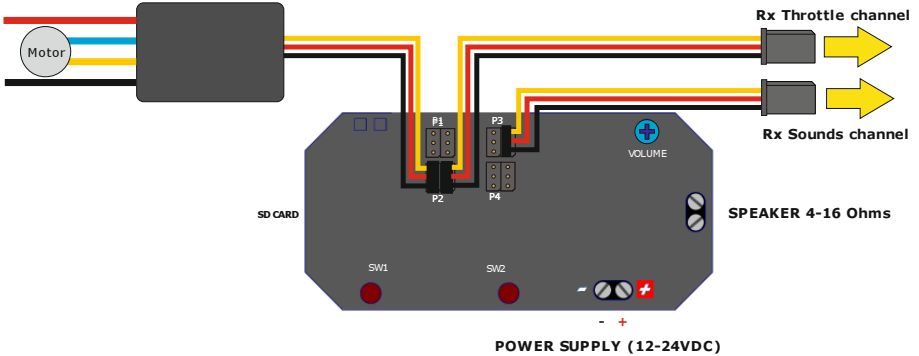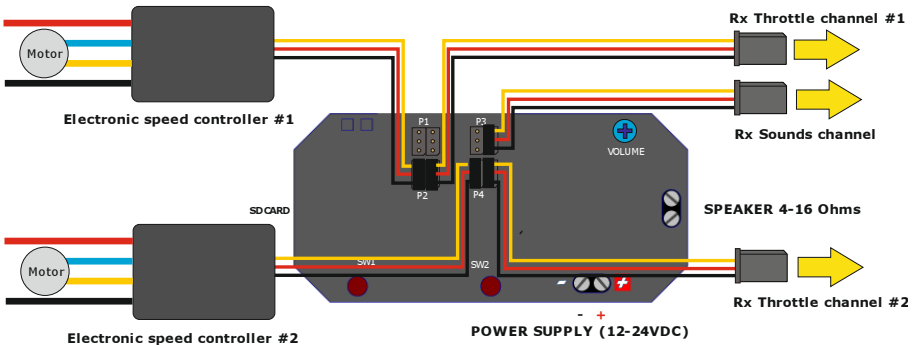
Installation

Speaker connection

Power input

Sample wiring diagrams:

SINGLE MOTOR WITH NO ADDITIONAL SOUNDS

SINGLE MOTOR WITH ADDITIONAL SOUNDS

TWIN INDEPENDENT MOTORS WITH ADDITIONAL SOUNDS

There are four inputs to the P110 (P1 – P4) which control sounds as follows:

P1   Individual sounds 1 – 16
P2   Engine sound #1
P3   Individual sounds 1 – 16
P4   Engine sound #2

Each of the inputs has two 3-pin headers which will accept a standard Futaba or JR/Hitec servo lead. The P110 is supplied with four male-male servo leads for connection to a receiver. Where the P110 is connected in-line between the receiver and ESC connect the male-male lead to one header & the lead to the ESC to the other. It doesn't matter which lead is in which position.

The P110 has two groups of control inputs – P1/P2 & P3/P4 and is capable of playing two sounds simultaneously, providing it is one sound from each group. i.e. it will play an engine sound from P2 & individual sounds on P3. If P1 & P2 are used, the engine sound will stop when an individual sound is played.

When connecting servo leads to the P110 the signal wire (white, orange or yellow depending on servo lead type) should go to the closest pin to the edge of the P110, however no damage will be caused if the connection is made incorrectly, but the P110 will not respond until the connector is put in the right way round.

Power should be supplied directly from the main battery. It is recommended that the system is run from 12V to 24V. Operation from a battery of more than 24V is not recommended and may cause damage to the P110. The P110 can operate down to 8V though the output volume will be reduced. The main circuits of the P110 will operate down to 4.8V but an external amplifier would need to be connected to the stereo output connection – see Section 2. Advanced Features for more details. A separate,

external voltage booster can also be used to provide the P110 with a 12V input where the battery used is below 8V.

The amplifier will output up to 25Watts, but it is recommended that the power is kept to 10W to minimise heating within the unit. The speaker can be either 4 or 8 ohm. The output volume is set using R18. Set the volume as high as required without distorting the sound.

Power up

When the system is powered up, it performs a set of diagnostics to ensure the system is able to run. The status is indicated by the LEDs:

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A rapidly flashing red LED indicates that either no SD card is inserted or the write protect is set. Insert the SD Card after ensuring the write protect is disabled.

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If the SD card with the write protect set off is detected, the LEDs change to rapidly alternating red and green. The P110 stays in this state until it detects a valid signal from the receiver on one or more of its input.

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Once a servo signal is detected the LEDs change to a slow alternating red and green. After a few seconds the LEDs switch off and the P110 is ready for normal operation.

Operation

Once the system has started up, the engine sounds can be started by pushing the appropriate throttle lever past the neutral position in either direction. This will play the engine start sound followed by the run sound. If the throttle is left in the neutral position for more than 60 seconds, the P110 will play the engine stop sound and silence the engine sound. The other sounds can still be played

If there are switched sounds on the SD-Card (sounds sound1.wav to sound16.wav), they are selected using switched channel P1 and switched channel P3. Sounds 1 to 8 are selected by pushing the stick forward and back to the neutral position the appropriate number of times. To make selection easier for the higher numbered sounds, pushing the stick backwards and back to neutral once will play sound 9, twice will play sound 10 and so forth up to 8 times will play sound 16. If a switched sound is playing it can be ended by selecting another sound to play.

Inputs P1 & P3 both access the same sound files, so you can play all 16 sounds from just one channel of your transmitter, however, if you use two channels of your transmitter you can then access different sounds at the same time.

Sounds 1 to 8 play once and then stop. Sounds 9 to 16 play continuously once selected – they can only be stopped by selecting another sound to play. Selecting a switched sound to play while another is playing will make the system play the second sound once the first one has finished. If multiple sounds are selected while one is playing, only the last one selected will be played once the first sound has finished. To stop a looped sound from playing without playing another sound, you need to select a sound which has not been setup (does not have a corresponding sound file). This will stop the looping sound playing once the sound has reached the end. Selecting the non-setup sound will have no effect on a non-looping sound (sounds 1 to 8)

2. Advanced Features

Adjusting idle & full speed sounds

Setup

Only enter the setup if you need to change the idle &/or full throttle speeds.

First of all make a backup of the files on the SD memory card supplied with your P110. The file that is changed in the setup process is "settings.fil" copying this file back to the memory card from your backup will restore your P110 to its default setting.

Setup requires a receiver to be connected to the Channel 1 throttle input (P2), the SD card inserted, & there needs to be a "run.wav" file holding the engine sound.

Power up the P110 in the normal way, but as the LEDs are flashing Pressing either button A or B & the P110 will enter setup. If no button is pressed the LEDs are switched off and the P110 starts normal operation.

The P110 flashes the green LED slowly. Set the throttle to the maximum position and press button A to confirm the maximum position has been set on the throttle. The LED changes to alternating red and green

Press button B to move onto the next stage. If you wish to change the maximum throttle position, set the stick accordingly and press button A again then press button B to move to the next stage.

The green LED flashes twice rapidly with a gap between. Set the throttle to the neutral position. Press button A to confirm the neutral position has been set on the throttle. The LED changes to alternating red and green

Press button B to move onto the next stage. If you wish to change the neutral throttle position, set the stick accordingly and press button A again then press button B to move to the next stage. If there is a "run.wav" sound on the SD-CARD the P110 starts to play it.

The P110 flashes the red LED slowly. Adjust the throttle stick to set the idle speed of the engine sound and press button A to confirm the idle speed has been set. The LED changes to alternating red and green

Press button B to move onto the next stage. If you wish to change the idle speed , set the stick accordingly and press button A again then press button B to move to the next stage.

The red LED flashes twice rapidly with a gap between. Adjust the throttle stick to set the maximum throttle speed of the engine sound and press

button A to confirm the maximum speed has been set. The LED changes to alternating red and green

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Press button B to move onto the next stage. If you wish to change the maximum engine speed , set the stick accordingly and press button A again then press button B to end the setup and enter normal operation.

Creating Sound Sets

Individual sounds should be created as Microsoft compatible WAV files. The P110 supports 8, 16 and 24 bit mono or stereo data. The sample rate should be 22,100Hz if you want to play two samples simultaneously. You can use CD quality wave files (44KHz sample rate) but the P110 will only be able to play one sample at a time. For engine sounds, the sample rate should be kept as low as possible while maintaining a good quality idle sound.

There are three distinct files for the engine – a start sound, a run sound and a stop sound. These should all be at the same sample rate. Also to prevent an audible click as the sounds transition from one to another, they should all start and finish at zero amplitude. This is easily achieved with a wave editing tool such as Audacity.

The sounds for a sound set should be copied to the root directory of the SD-Card and titled as followed:

- sound1.wav – Sound number 1
- sound2.wav – Sound number 2
- sound3.wav – Sound number 3

- sound4.wav – Sound number 4
- sound5.wav – Sound number 5
- sound6.wav – Sound number 6
- sound7.wav – Sound number 7
- sound8.wav – Sound number 8
- sound9.wav – Sound number 9
- sound10.wav – Sound number 10
- sound11.wav – Sound number 11
- sound12.wav – Sound number 12
- sound13.wav – Sound number 13
- sound14.wav – Sound number 14
- sound15.wav – Sound number 15
- sound16.wav – Sound number 16
- start.wav – Engine start sound
- run.wav – Engine running sound
- stop.wav – Engine stop sound

The P110 will not recognise sounds with other names. If a sound is not present on the SD-Card, the unit will skip playback if it is selected. This includes the engine sounds. For example if there is no engine start sound, the engine run sound will play as soon as the throttle stick is moved from the neutral position.

Sounds 1-8 will each play just once, whereas sounds 9-16 will play continuously until stopped – by selecting a different sound. It is recommended that you omit one sound file, say sound 9, which can then be easily selected to stop a repeating sound (if there is no file stored as sound9 the P110 will simply stop whichever sound was looping) This will not interfere with the engine sound.

Memory Card

The P110 is supplied with an SD type memory card with a set of sounds already stored on it. For the P110 to play other sounds you simply need to copy the files you need to any standard SD memory card & name them as per the previous table.

Further Advanced Features

The P110 can read stereo files, however these are converted to mono for its internal amplifier, the P110 can be connected to a separate stereo amplifier if desired.