Auscision 48/830 Class DCC Operating Information

Your Auscision 48/830 class models main printed circuit board and associated lighting has been designed to function as a **DC / DCC Ready and DCC Sound Decoder Installed Model**.

DC Model

The DC model is able to control the locomotives lighting via the micro switches on the bottom of the fuel tank. The lighting is directional. The switches are able to isolate, turn on/off:

1. The Locomotives Headlights.
2. The Locomotives Number Boards and White Marker Lights.
3. The Locomotives Red Marker Lights.

The lighting connection for this version has the lighting wiring connected to the main printed circuit board at the plug marked **'Standard DC Version'** (See image on page 2)

If you're going to operate your model on a DC system /controller then read no further. If you plan on fitting an after marker decoder or your model is a DCC Sound Ready model please read on.

DCC Ready Model - fitting an aftermarket decoder

The 48 / 830 class models main PCB has been specifically designed to integrate and function with an **ESU Loksound Select Series OEM decoder**. This decoder utilises the **NEM660** standards 21pin connections which uses four individually powered auxiliary outputs from the decoder (Headlight front, Headlight rear, Aux 1 and 2) and four individual logic outputs (Aux 3-6) which the Main Circuit Board has components included for their operation. Lighting for this version connects to the plug marked **'DC/DCC Sound Versions'** (See image on page 2)

When selecting an aftermarket decoder a few details may need to be considered first.
As there are two standards of decoder 21pin connections on the market, the **NEM660** version and the **NRMA** version, two lighting connection possibilities are available on the Main PCB - **'Standard DC Version'** and **'DC/DCC Sound Version'** (see image on page 2). The lighting connection will be dependent on the brand and version of the aftermarket decoder being used. Generally speaking any aftermarket 21 pin decoder can be fitted.

For the majority of aftermarket decoders with a reduced number of auxiliary lighting outputs, the Locomotives **Reversible Headlights** along with **Auxiliary 1** (Front Number Boards, Front White Marker Lights, Rear Red Markers lights) and **Auxiliary 2** (Rear Number Boards, Rear White Marker Lights, Front Red Markers lights) will function as long as the Marker Lighting is connected to the **'Standard DC Version'** PCB plug connection. Note: The Lighting functions can also be isolated with the micro switches on the bottom of the fuel tank. (E.g. turning the opposing end, red marker lighting off).

ESU's Retail Select decoder 73900 REV2, loaded with the 48/830 file and connected to the **'DC/DCC Sound Version'** plug will also operate as per the OEM version with all eight lighting functions, mapping and functionality. (A web link to the file is on page 3).

Alternatively refer to the link below for further decoder possibilities. This is an excellent source of information which addresses the 21pin NEM660/NMRA standards and their associated differences and functionality issues, along with a chart identifying which other brand decoders and versions that may also be suitable.

http://www.sbs4dcc.com/tutorialstipstricks/21mtcconnector.html

Once the model's body is removed from the chassis, **taking note of the lighting connection plugs alignment**, first remove the small 21pin DC adaptor PCB from the main PCB's 21 pin plug. This now also removes the components associated with motor noise suppression for DC function. (See the below image). Then, and paying close attention to the pin alignment, firmly push the decoder onto the 21 pin plug.

Note: Inadvertently plugging the lighting into the wrong plug should pose no risk to damaging any circuitry, although care should be taken ensuring the lighting is connected to the correct plug for the decoder that has been selected.

Speaker connection is via the supplied connector plug/wiring harness, fitted to the plug marked 'SP' (see image below). Keep in mind matching the chosen speaker and decoder's amplifier impedance.

DCC ESU Sound Decoder Installed Model

Your DCC Sound Installed Model is fitted with an ESU Loksound OEM Select Series Decoder. All switches on the bottom of the fuel tank are to remain in the turned on position. The Decoder connects to the main printed circuit board via the 21pin connector, with the wiring lighting plug connecting to the main PCB at the **'DC/DCC Sound Version'** marked position. (See below image. Please note - DC adaptor PCB version fitted in this image).

The decoders default settings have been adjusted to ensure your model operates smoothly straight out of the packaging. Please take a moment to read through the following information as it relates to the functionality and features, along with further information as to individualising your model.

DC/DCC Sound Version plug

DC/DCC Ready Version plug
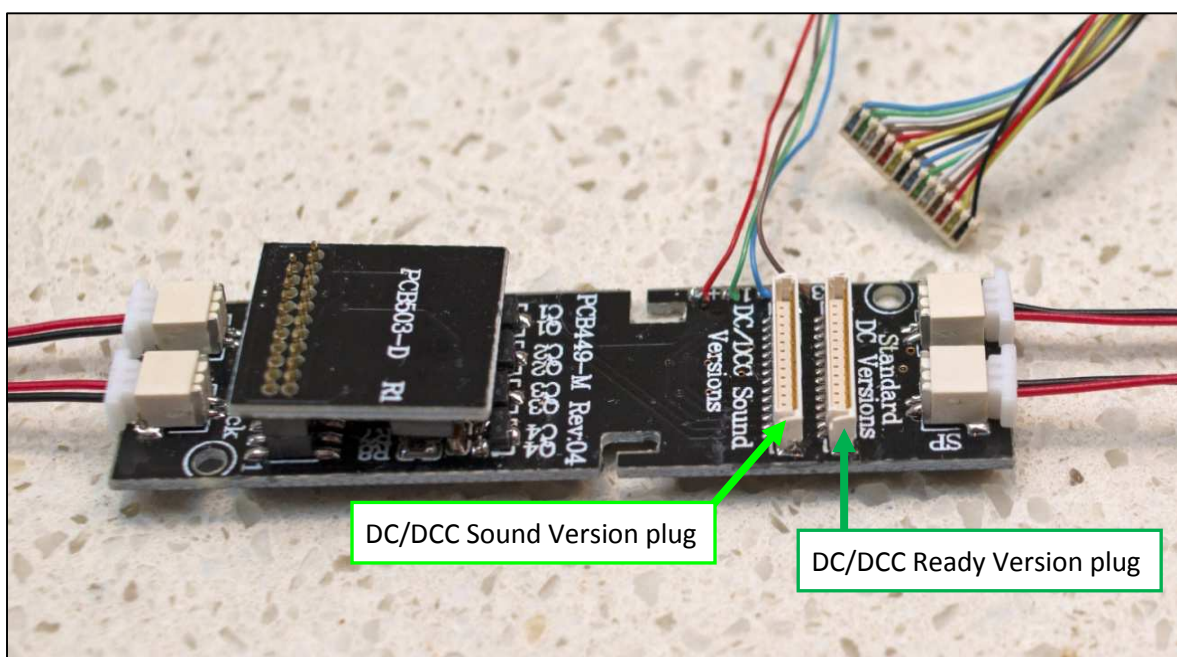
- In order to adjust the running qualities of your model to your personal preferences, reference to suggested settings in the form of a quick start guide is available in the following notes. Alternatively for full decoder adjustment details refer to the ESU Loksound Select Series Decoder Manual and Full Throttle Description available at the following links:

  http://www.esu.eu/en/downloads/instruction-manuals/digital-decoders/

  http://www.esu.eu/en/products/loksound/loksound-full-throttle-diesel-features/

  A description of the ESU 95461-LSSelect-Diesel-Auscision-Goodwin-6cyl-251-48/830-Class-FT file and link to a downloadable Select Series Decoder Full Throttle Default file can be found here:

  http://projects.esu.eu/projectoverviews/6

- If required, adjustments and individual fine tuning of your DCC model / decoder can be made primarily in two ways.

    1. The most simple and effective way is with an ESU Lokprogrammer interfaced with a Windows operating system PC. The details of which can be found here:

       http://www.esu.eu/en/products/lokprogrammer/

       http://www.esu.eu/en/downloads/instruction-manuals/lokprogrammer/

    2. Alternatively adjustments can be made via your DCC operating system controller or with other PC based software such as JRMI. Refer to your operating system manual and the ESU Select Series decoder manual.

Quick Start Guide

Care has been taken in order for your model to perform straight out of the packaging. In general it has been programmed to ESU Loksound's Select Decoder default values. As modellers we all have different ideas and preferences as to how our models perform. Should you wish to further adjust how your model performs, the following is a quick start guide to some of the primary settings required to do so.

Excerpts from the ESU Loksound Select Manual and Lokprogrammer references are included in the description and are as follows (please refer to the Select Decoder Manual, the Lokprogrammer Manual or your DCC systems programming section for full programming details).

- The Default Locomotive Address for all 48 / 830 / Silverton DCC ESU Sound Installed models is **3.**

  In order to change the locomotive address, refer to chapter 5.2.1 and 9.1 of the ESU Select Series Decoder Manual. Individual DCC controller systems may also have a programme track output and function available for this purpose.

- Decoders operating within a **DC operating system** will function as per ESU's default DC settings. As the decoder has been primarily set-up for DCC functionality, when operating in a DC environment only the prime mover sound function and reversible headlights will operate out of the packaging.

In order for the auxiliary lighting to function correctly using the decoder in **DC mode** the following is required. ESU recommends using Lokprogrammer to enable these adjustments.

1. On the Locomotives Main PCB, change the lighting connection plug to the socket marked **'Standard DC Versions'**

2. Under the 'Analogue Settings' tab in Lokprogrammer, check box's F7 and F9 also need to be ticked and written to the decoder.

3. Under the 'Function Mapping' Tab in Lokprogrammer F7 **'Forward'** and F9 **'Reverse'** directions require enabling and writing to the decoder. (See the following images)

To ensure correct auxiliary lighting function when operating in **DC mode**, the power must be reduced to a point that the lighting extinguishes before changing locomotive direction. If the locomotive direction is changed whilst enough power remains that enables the lighting to remain lit, erratic lighting function can then occur. If lighting becomes erratic, simply return power to zero.

The lighting control switches on the bottom of the fuel tank can also be used to control the auxiliary lighting. E.g. turning the opposing ends red marker lights off.

> *PLEASE NOTE:*
>
> *If the DC settings shown below and on the next page are used on a DCC system, erratic auxiliary lighting function will occur. If a model is to be regularly used in both DC and DCC control, it is recommended to leave the decoder in the "as delivered" default condition.*
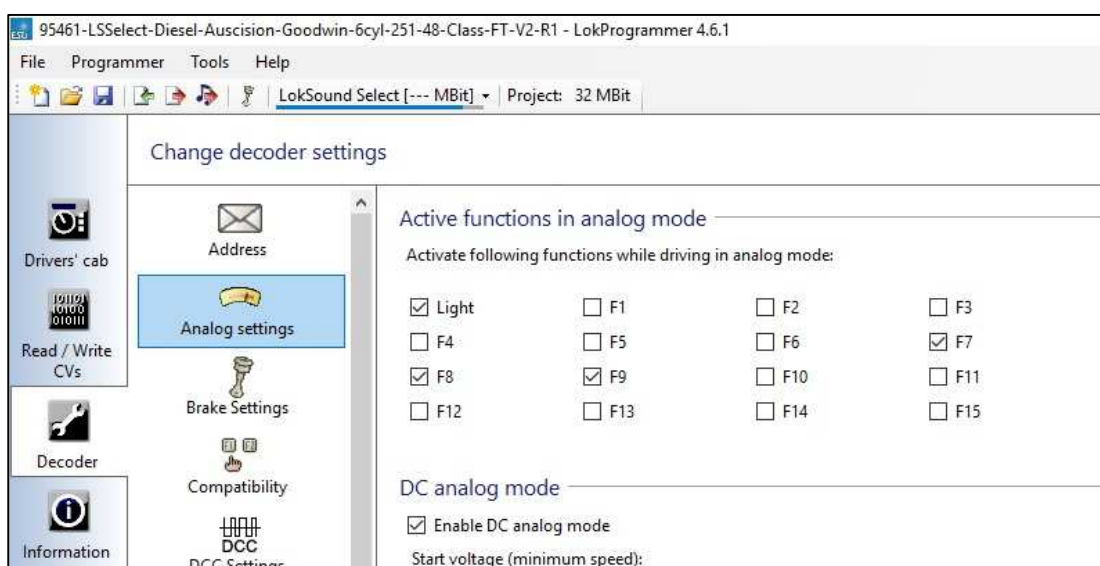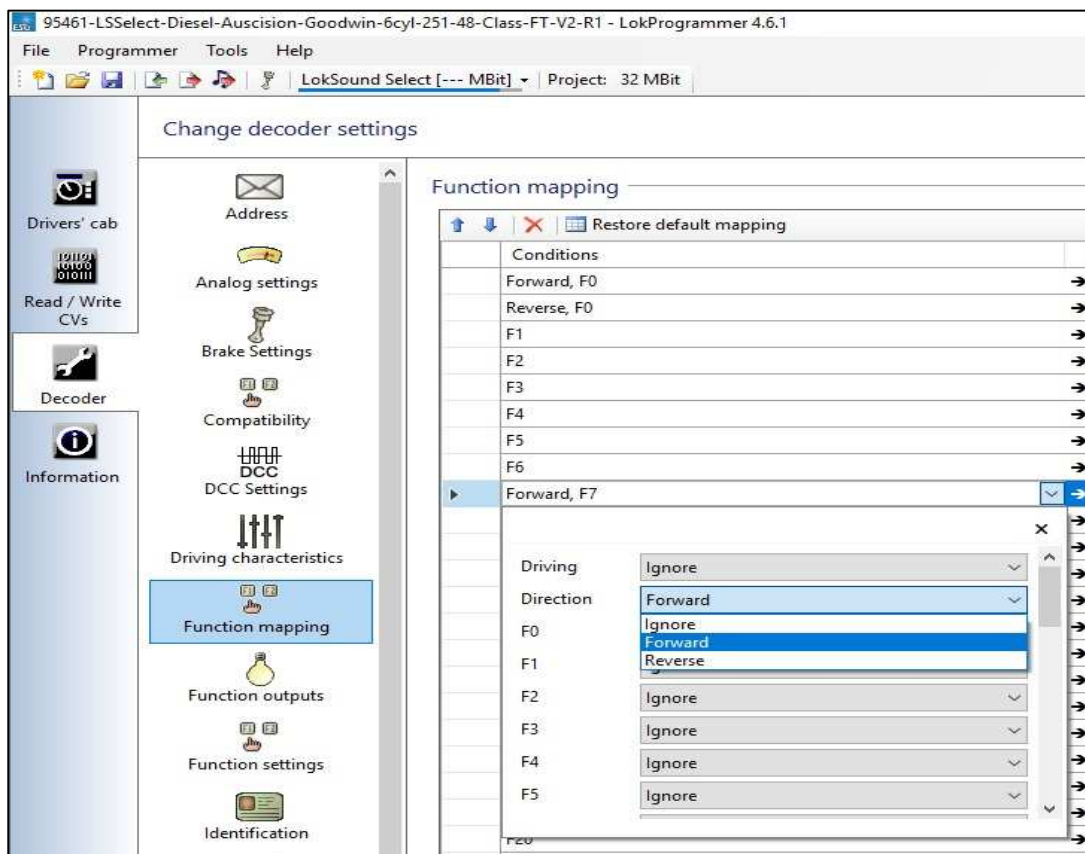
Motor Auto Tune Procedure

Should you encounter any running performance issues the following Auto Motor Tune procedure may help resolve the problem.

This feature will automatically adjust the Motors Back-EMF in most cases. This is not meant to be a "cure all" solution. In most cases this will be all that is required, however there still **may** be the need to perform some manual adjustments.

In order to use this automatic adjustment you will first need to place your locomotive on a section of track paying attention to the set direction of travel. Set CV 54 to a value of 0. Activate function F1. **(Be sure to have plenty of clear space ahead of your locomotive. You will need at least 2 meters of available track)** Your locomotive will quickly take off at full speed and then stop while reading the motor responses. This will automatically set the load compensation in CVs 52, CV 53, CV 54, and CV 55. From here you can make any other manual adjustments if needed.

Refer Loksound Select manual chapters 5.2.2 for full motor adjustment details.

Starting voltage, Max and Medium Speed

As default, the decoder will automatically detect the user's controller speed step settings, with the controller using 14, 28 or 128 steps (28 being common).

- LokSound Select decoders are programmable to recognise speed step values from 1 -255.

- Default is a 3 step speed adjustment as per the graph below. (Note: In addition there is also a 28 step speed version available. ESU recommends using a Lokprogrammer in order to make the necessary adjustments with this version)

- Defaults are CV2 =3 (start value), CV6 = 115 (mid value), CV5 = 255 (top speed value).

3-step speed curve using CV 2, 6, 5
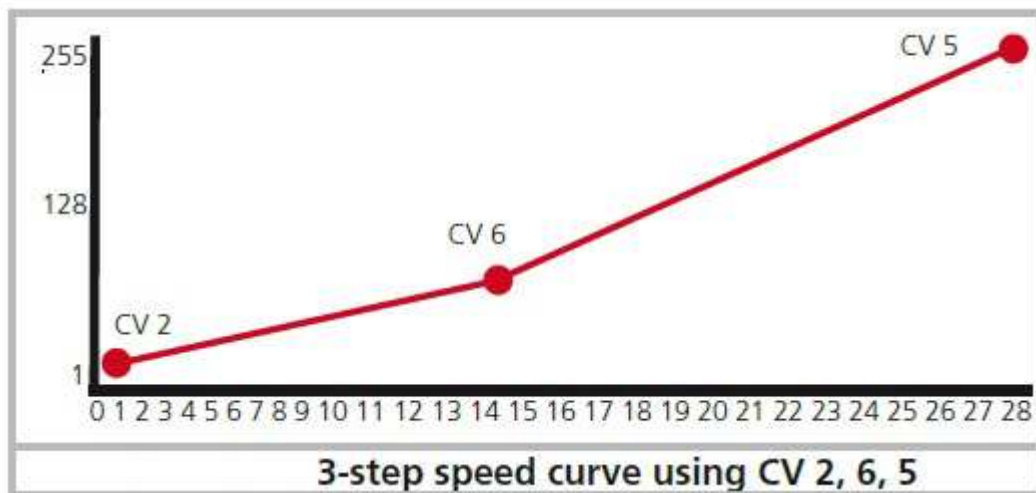
Acceleration Momentum and Deceleration Momentum

The models acceleration momentum time and deceleration momentum time can be adjusted individually.

The time for accelerating from 0 to maximum speed is adjusted in CV 3 (default value = 80, which equates to 20 seconds) while deceleration is set in CV 4 (default value = 80, which equates to 20 seconds). Value Range is from 1 to 255 (Range is in 0.25 second increments, so every 4 values = 1 second)

The times set in these CVs work speed dependant. Therefore, the acceleration distance and the brake distance are longer at high speeds. In other words, the faster the locomotive moves, the longer the distance until it stops.

DCC Function Table

F0	**Directional Headlights**
F1	Not in use. For future applications
F2	**Playable Air horn**
F3	**Drive Hold (Full throttle feature)**
F4	**Non Dynamic Brake Locomotive. Applies correct trailing unit consist Dynamic Brake functionality. (Please see further details/description on page 7)**
F5	**Locomotive Brake (Full throttle feature)**
F6	**Headlight Dimmer Control**
F7	**Front #1 End. Marker and Number Board Logic (See notes on page 8)**

F8   Prime Mover Locomotive Sound   (Start/Stop)

F9   Rear #2 End. Marker and Number Board logic   (See notes on page 8)

F10   Manual Coupler sounds

F11   Coast   (Full throttle feature)

F12   Run 8   (Full throttle feature)

F13   Manual Cooling Fan on/off

F14   Acceleration / Shunting mode   (Turns off any momentum settings. Runs at half speed)

F15   Volume Fade Control   (set at 50% normal volume level - ideal for loud multiple unit consists)

F16   Manual Sanding Valve on/off

F17   Manual Compressor on/off

F18   Brake Set / Brake Release   (Default is on. Brake Valve Sound plays when moving off or stopping)

F19   Not in use

F20   Enabled. Allows lighting (AUX1-6) access for manual brightness adjustments. (See below)

F21 to F28   Not in use

Function button 4 (Dynamic Brake Logic)

48 / 830 Class locomotives **do not** have Dynamic Brakes. The function 4 feature has been included so that your model will function (sound) correct when the locomotive is a trailing unit in consist mode (Multiple Unit).

There are various timers contained within this logic and a description is as follows:

- With ESU's Full Throttle features and F4 is activated in consist, all locomotives Engine Revs (including the 48 / 830's) will drop to idle while still maintaining the set current speed.
- Only Dynamic Brake equipped locomotives (and not the 48 / 830 class) will then rev to notch four RPM's and engage the dynamic brake sound.
- When F4 (dynamic brake) is turned off, the dynamic brake equipped locomotives will turn off the dynamic brake sound and reduce engine RPM's to idle.
- After a short delay all locomotives, including the 48/830 class locomotives, will then begin to increase engine RPM's to the current speed setting on the controller.

If you inadvertently turn on F4 while running your 48 / 830 model on its own or as a leading locomotive in consist, the above sound process will activate (even though, prototypically, the 48 / 830 class cannot activate trailing dynamic braked locomotives). If activated, F4 will need to be turned off and the feature allowed to run its course.

Function button 7 (Front #1 End Auxiliary Lighting Logic)
Function button 9 (Rear #2 End Auxiliary Lighting Logic)

The lighting for each end of the locomotive has been divided into four separate lighting states. By pressing the function key repetitively the following applies:

State 1.   All Lighting Off.

State 2.   Number Boards On. White Marker Lights On.   (As in leading end mainline running)

State 3.   Number Boards On.   Red Marker Lights On. (As in yard shunting. Both ends)

State 4.   Red Marker Lights On.   (As in the trailing end of a light engine movement)

(State 4 is followed by State 1)

Note: If required, the individual light brightness can be controlled / adjusted separately. Refer to the ESU Select Series Decoder Manual, with reference to the auxiliary outputs 1 through 6.

#1 end Auxiliary Lighting

Aux 1 - Number Boards, Aux 3 - White Marker Lights, Aux 5 - Red Marker Lights

#2 end Auxiliary Lighting

Aux 2 - Number Boards, Aux 4 - White Marker Lights, Aux 6 - Red Marker Lights

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PLEASE NOTE:

In order for the Function 7 and Function 9 auxiliary lighting to work, ESU Loksound had to create a lighting logic template. This template is NOT built into the decoders function logic, however utilises two of the eight available sound processing flow channels.

Therefore, under certain circumstances and especially when BOTH ends of the model's F7/F9 auxiliary lighting are turned on, then some of the secondary sounds may not function. (For example brake squeal when stopping) This is due to the non availability of spare sound channels at that particular moment in time, and is not a fault with your decoder.

If any activated secondary sound functions (including the F7 and F9 lighting) appears erratic/frozen, turn off the locomotive prime mover (F8). This will then allow any processes selected and queued the available space to function and complete. Once complete, the prime mover (F8) can then be turned back on as normal.

If this type of sound response is an issue, then to free up sound channels the individual auxiliary lighting control can be remapped to the spare logic function spaces that are still available on the decoder.

A Lokprogrammer and computer interface will be required in order to achieve this.

Locomotive Horn Sounds

The default horn sound file for your model is a Westinghouse/Wabco Single A/B (**CV48 = 5**).
To alter the horn sound to the applicable type, refer to the list below and the ESU Loksound Select Series Decoder Manual

CV48	Horn type	Application
1	RVB Hurricane 3 Chime	Silverton Locomotives 28 and 29
2	RVB Hurricane 5 Chime	All Series 4 48 Class - 48126 to 48165
3	Twin RVB Hurricane 5 Chime	All Series 4 48 Class - 48126 to 48165
5	Westinghouse/Wabco Single A/B	All Series 1, 2 and 3 48 Class - 4801 to 48125
14	Westinghouse/Wabco AA/BB #1	All Series 1, 2 and 3 48 Class - 4801 to 48125, all South Australian 830 Class plus Silverton 48s31
15	Westinghouse/Wabco AA/BB #2	All Series 1, 2 and 3 48 Class - 4801 to 48125, all South Australian 830 Class plus Silverton 48s31

Decoder Reset

If at any point your model's decoder becomes unresponsive, it may simply require a reset in order to regain normal function. You can reset the decoder to the current memory default settings at any time.

In most cases POM (Programming on the Main) will not work to reset a decoder. Please use a separate programming track.

To reset the decoder:

- **Refer to the ESU Select Series Decoder manual for full details.**
- **Enter the value 8 into CV8.**
- **To complete the reset, power to the decoder must be interrupted.**

For ease of connection to the web links attached within this document, an online version of the 48 / 830 class Operating Information can be found on the Auscision website at the below links:

http://www.auscisionmodels.com.au/48%20Class%20Locomotive.htm

http://www.auscisionmodels.com.au/830%20Class%20Locomotive.htm