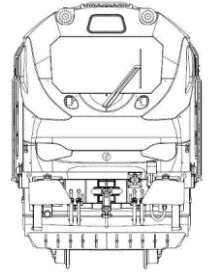


Thank you for purchasing this Dapol product. This information is applicable to all versions of this locomotive.



- The model can be controlled with a DCC decoder or by DC operation and is factory set for DC operation.
- The model is shipped with directional head and tail lamps and leading cab light 'ON'. It is ready to run in DC mode or with a 2 function DCC decoder. Full operation and selection of lighting functions in DC mode is described in section 4.
- DCC decoder fitting instructions and description of DCC lighting is in section 5 and the DCC guide sheet.

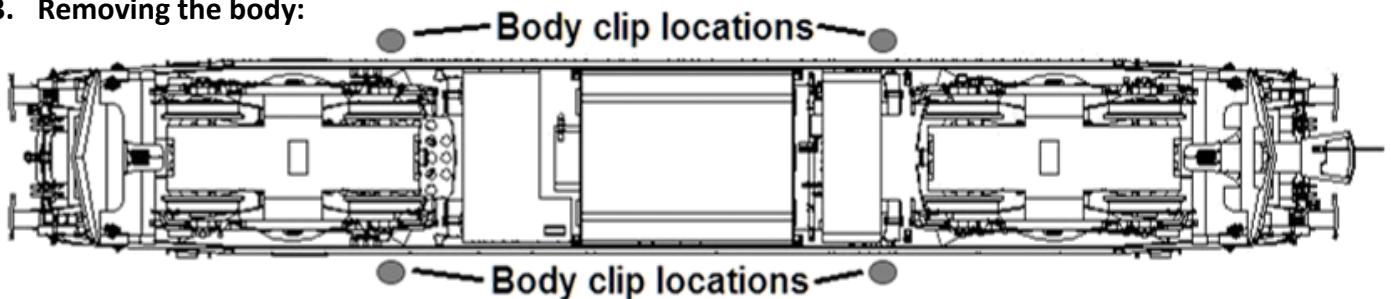
**1. Running in / First use:** No special running in or initial lubrication is required, as our 'new generation' locomotives have been designed with care to offer many years of service with minimal maintenance. However, we suggest that before you operate your model for an extended time, you first run it in both directions at a low speed whilst checking for correct operation. This operation can be performed in either DC or DCC (after fitting a decoder – see section 5) Also, please check that you have the following items within the packaging (in addition to this sheet).

- a) Dapol 'No Quibble' warranty sheet
- b) DCC Guide sheet

**2. Fitting accessories:** All detail parts have been factory fitted to your locomotive,

- a. Your model has been supplied fitted with one slotted and one unslotted valance. A spare valance has been provided for use in case you wish to change the coupling set-up of your model. The fitted valances are a push fit into the body and can be carefully pulled to remove. To re-fit, push the valance into position.
- b. The NEM coupling can be pulled out from its pocket and the pocket can be removed entirely to allow an unslotted valance to be fitted (or vice-versa)

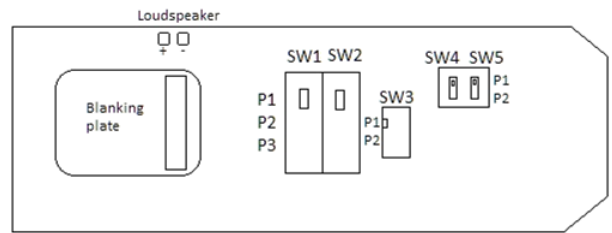
**3. Removing the body:**



- a. The body is held to the chassis by 4 clips, these are positioned adjacent to the bogie as shown above.
- b. Two methods of body release can be used:
  - i. Carefully avoiding underframe detail, locate the inboard recesses moulded into the chassis (located near the inboard wheels), using these, gently ease the body outwards whilst pulling up on the chassis. Repeat with the remaining three clips.
  - ii. Using four offcut strips of thin plastic sheet, slide a strip between the body and chassis near the clip, slide towards the clip until you feel resistance then work the strip between the clip and body. Repeat with the remaining three clips until all four strips are in place the body can then be lifted off.
- c. The body will lift clear of the chassis once all clips are released. There is no need to be concerned about wires, as a 'plugless' connector has been used which will separate when the body is removed.

**4. Internal switch function:** You will note 5 switches on the internal control board. The lighting operation has been chosen to permit choice of cab lighting options (leading, trailing off or both on) as well as control of lights for push-pull operation.

**TIP:** Switches 1 and 2 (Cab light control) can be accessed easily by removing the exhaust moulding on the roof. The function of the switches is shown in the table overleaf:



Switch	Description	Position 1 (P1)	Position 2 (P2)	Position 3(P3)
SW1	No. 1 end Cab light control	On when leading	Always Off	On when Trailing
SW2	No. 2 end Cab light control	On when leading	Always Off	On when Trailing
SW3	Refer to description below	4 or 6 function DCC	DC or 2 function DCC	N/A
SW4	No. 1 End Push pull lighting control	#1 end Lamps on	#1 end lamps off	N/A
SW5	No. 2 End Push pull lighting control	#2 end Lamps on	#2 end lamps off	N/A

**Switch 3 (SW3) Note:** This switch is used to turn off the lighting at No. 2 end when using DC or a 2 function DCC decoder. If using a 4 function (or above) DCC decoder and you wish to independently control the rear lights, place this switch in position 1 (This will disable #2 end lamps if a 6-function decoder is not fitted). When in position 2 (factory set position) the front and rear lamps are controlled by SW4 & SW5

**5. Fitting a DCC decoder:** This model accepts a standard **21 pin MTC DCC Decoder**. To use all functions a SIX function (MTC) decoder will be required. Please refer to the separate DCC guide for full information. Regardless of the decoder type (sound or non-sound), the basic fitting remains the same, however, if you are fitting a sound decoder, instructions on installing a speaker are shown as optional steps below.



- Remove body (section 3 above)
- Remove DC blanking plate (We suggest easing it gently and evenly alternately on both sides, pulling is likely to result in bent pins!)
- Insert decoder, aligning the decoder key pin with the 'missing' pin of the locos plug.
- Optionally install loudspeaker (DCC Supplies part 100673 100 ohm/100789 8 ohm/103543 4 ohm to suit your sound decoder) by soldering its wires to the marked areas of the PCB (SPR+ and SPR-) (also shown in the diagram in section 4).

**6. Maintenance:** We have designed the model using components which require little maintenance, however we suggest that after every 100 hours running a lubrication service is performed using a light *synthetic* lubricating oil such as Dapoil or Locolube™. Mineral oil types or thicker oils may damage your locomotive and/or invalidate your warranty.

- When applying lubrication only 1 or 2 drops are required on the gear-train, *do not over oil, over oiling may damage paint finishes and/or cause build-up of dust*. Remove surplus oil using a lint free cloth.
- Regularly check your model for build-up of dust or loose scenic materials around moving parts.

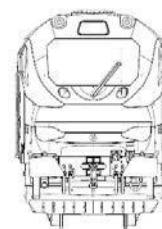
**7. Spare parts:** A range of spare parts are available from Dapol service centres.

# Dapol OO gauge class 68 locomotive Imperium DCC Fitted version: users guide.

This guide is applicable to the Dapol factory fitted  
DCC (non-sound) models.



Due to design of the models lighting for 'Push-Pull' operation, please read this guide in full as some features may not operate in the manner you are used to.



**Note: Factory reset.** The DCC decoder in this model has been set-up to operate the lighting as described below. If a factory reset is performed, then the functions will no longer operate as programmed. To restore settings for the class 68, follow the instructions overleaf (*Restore class 68 settings*).

**DCC Address:** The model is set to address 3

## Function key summary:

- F0 – Light engine (Front/Rear lights directional)
- F1 – Push-pull #1 end to train (#2 end lamps on - White/Red directional dependent)
- F2 – Push-pull #2 end to train (#1 end lamps on - White/Red directional dependent)
- F3 – Halo lamps (directional)
- F4 – Day mode (Dim lamps)

## Lighting modes:

**Note: F2 operation.** This decoder uses function 2 on your handset to operate lighting at the No. 2 end. Some DCC control systems set F2 as a momentary function. Please refer to your controller manual to change this behaviour or, you may prefer to change the decoder settings to use an alternative function key; refer to '*Remapping your class 68 functions*' overleaf.

Four different lighting modes exist. Select whichever one is appropriate to the train you are operating:

- **Light engine mode (F0)** DCC 'standard lighting mode. ie; white headlights in the direction of travel, red tail lights to the rear, automatic reversal of the lights when 'changing ends'.
- **Push-pull / train mode (F1/ F2)** Class 68's are often used in push-pull mode with Driving Van Trailers (DVT's), or 'top & tail' mode with another Class 68. A single press of F1 or F2\* can be used to configure all lighting functions appropriately, with the lighting functions changing automatically as appropriate with no further intervention.
  - F1 operates the lamps at No. 1 end
  - F2 operates the lamps at No. 2 end

\*See note on F2 operation above

**Halo Lamps (F3)** The unique class 68 halos are used when the loco is stationary for some time. These will also reverse automatically when changing ends. (for best effect, turn off the main lights!)

**Decoder reset:** The decoder is factory programmed to operate in the above manner, therefore a factory reset (CV8 =4) will return the model to address 3. The lighting functions will no longer operate as shown above. Please refer to the paragraph '*Restore class 68 settings*' overleaf.

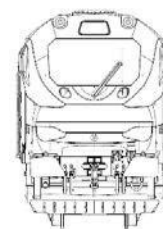
The decoder used is a Dapol Imperium and full programming information can be found on our website: [www.dapol.com](http://www.dapol.com)

# Dapol OO gauge class 68 locomotive Imperium DCC Fitted version: users guide.



## Restore class 68 functions

Dapol have programmed the decoder in your class 68 model to operate the lighting in a prototypical fashion. If you perform a factory reset, then you will then need to reset the CVs to reproduce the original lighting operation. Please refer to the programming/CV change section in your control system manual. The following CVs should be set to the values provided:



CV33 = 5  
 CV34 = 6  
 CV35 = 10  
 CV36 = 9  
 CV39 = 16  
 CV40 = 16  
 CV49 = 8  
 CV50 = 16  
 CV51 = 24  
 CV52 = 0  
 CV53 = 0  
 CV54 = 16

## Remapping default class 68 functions

Some control systems pre-set the operation of the F2 key as a 'momentary' action, the default settings of your DCC fitted class 68 model operate best with F2 set as 'Latching'. Your control system manual will describe how to change this behaviour.

### Example F2 key changes for systems using F2 as 'Momentary'

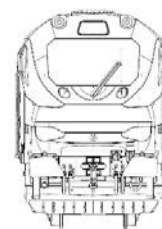
Digitrax Zephyr:	Digitrax DT400/402	Gaugemaster prodigy
<ol style="list-style-type: none"> <li>Press and hold the HORN/2 key.</li> <li>Press and hold the EXIT key.</li> <li>Release the HORN/2 key</li> <li>Release the EXIT key.</li> </ol>	<ol style="list-style-type: none"> <li>Hold the Horn (#2) key down,</li> <li>press the PWR key</li> <li>Release both keys simultaneously</li> </ol> <p><b>To revert F2 (make it non-latching) repeat the above.</b></p>	F2 cannot be changed on this handset.

Alternatively, if you prefer to change the operation of the decoder to assign lighting functions to different keys on your control system please follow the instructions below. Change the two CVs for the lamps you wish to change to the values shown under the function key you require to control those lamps. Please note that if moving functions within the range of F1-F3 additional changes are required. The decoder fitted to this model a Dapol Imperium. Full programming information can be found on our website: [www.dapol.com](http://www.dapol.com).

To be controlled by Fx (F1-6)							
Lamps	CV	F1	F2	F3	F4	F5	F6
#1 end lit	33	5	9	17	33	65	129
	34	6	10	18	34	66	130
#2 end lit	35	6	10	18	34	66	130
	36	5	9	17	33	65	129
Halo lamps	39	4	8	16	32	64	128
	40	4	8	16	32	64	128

# Dapol OO gauge class 68 locomotive DCC Sound users guide.

This guide is applicable to the Dapol factory sound fitted models. Due to design of the models lighting for 'Push-Pull' operation, please read this guide in full as some features may not operate in the manner you are used to.



**DCC Address:** The model is set to address 3

## Some notes about sound functions:

1. Some sounds are disabled when the loco is stationary (e.g. flange squeal). Others are disabled whilst the loco is moving (e.g. despatch whistle).
2. Some sounds operate automatically and are **enabled** by pressing the appropriate function key (e.g. dynamic braking fans, brake application sounds etc.). These sounds will only be heard when certain prototypical conditions are met (i.e. when braking heavily).
3. Some sounds such as horns, air release & door slam are playable with the engine switched off, as per the prototype.

## Function key summary (see following pages for full descriptions)

- F0 Light engine mode
- F1 Sound on / off
- F2 Playable high horn
- F3 Playable low horn
- F4 Automatic buffering up (when moving slowly) / Coupling hook (when stationary)
- F5 Automatic brake application (when moving) / Brake dump (when stationary)
- F6 Driver's door slam
- F7 Compressor
- F8 Drive hold
- F9 Automatic, variable-speed flange squeal
- F10 Despatch whistle
- F11 Guard to driver 'right away' signal & optional reply
- F12 Dynamic braking fan
- F13 Sanders
- F14 Directional halo lights
- F15 Electric Train Heat (ETH)
- F16 Mk3 coach wail
- F17 Windscreen wipers
- F18 Detonators
- F19 Train mode (train at #1 end)
- F20 Train mode (train at #2 end)
- F21 Parking mode
- F22 Cab start sounds

## Sound and lighting modes

Four different modes exist. Select whichever one is appropriate to the train you are operating:

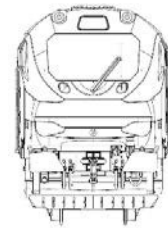
- **Light engine mode (F0)** DCC 'standard lighting mode. ie; white headlights in the direction of travel, red tail lights to the rear, automatic reversal of the lights when 'changing ends', all sounds work in both directions.
- **Halo Lamps (F14)** The unique class 68 halos are used when the loco is stationary for some time. These will also reverse automatically when changing ends. (for best effect, turn off the main lights!)
- **Push-pull / train mode (F19 / F20)** Class 68's are often used in push-pull mode with Driving Van Trailers (DVT's), or 'top & tail' mode with another Class 68. A single press of F19 or F20 can be used to configure all the sound and

## Dapol OO gauge class 68 locomotive DCC Sound users guide.



lighting functions appropriately for any of these scenarios, with the sound and lighting functions changing ends automatically as appropriate with no further intervention.

F19 is used if the train is at the loco's #1 end, and F20 if the train is at the #2 end (the model has #1 and #2 printed on the cab doors, just like the real loco's).



In either of these modes the head & tail lights next to the train are always off regardless of direction. The lights at the other end of the loco are white going forward and red in reverse. The directional sounds only work when the loco is leading (they come from the DVT or the other loco when the loco is trailing).

**Halo lights** can be added in either case by pressing F14. The lights will only show when the loco is leading (when the loco is trailing the halo lights are next to the train and hence disabled).

**Parking mode (F21)** F21 causes red lights to be shown at both ends of the loco simultaneously and all headlights are extinguished.

## Full description of functions:

### Sound and lighting modes

In order to greatly simplify the simulation of the real locos and the trains which they operate, four different function keys have been set up as follows. Use whichever one is appropriate to the train you are operating;

### Light engine mode (F0)

This works in the same way as F0 on other DCC locos, ie; white headlights in the direction of travel, red tail lights to the rear, automatic reversal of the lights when 'changing ends', and all sounds work in both directions.

The unique 'halo' lights of the Class 68 can be added by turning on F14. These will also reverse automatically when changing ends.

### Push-pull / train mode (F19 / F20)

Class 68's are often used in push-pull mode with Driving Van Trailers (DVT's), or 'top & tail' mode with another Class 68. A single press of F19 or F20 can be used to configure all of the sound and lighting functions appropriately for any of these scenarios, with the sound and lighting functions changing ends automatically as appropriate with no further intervention.

F19 is used if the train is at the loco's #1 end, and F20 if the train is at the #2 end (the model has #1 and #2 printed on the cab doors, just like the real loco's).

In either of these modes the head & tail lights next to the train are always off regardless of direction. The lights at the other end of the loco are white going forward and red in reverse. The directional sounds only work when the loco is leading (they come from the DVT or the other loco when the loco is trailing).

Halo lights can be added in either case by pressing F14. The lights will only show when the loco is leading (when the loco is trailing the halo lights are next to the train and hence disabled).

### Parking mode (F21)

F21 causes red lights to be shown at both ends of the loco simultaneously and all headlights are extinguished.

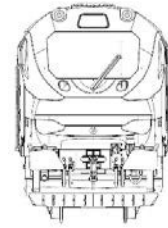
### Engine priming & starting (F1)

1. To carry out a normal engine start sequence turn F1 on and leave it on. The engine will prime for around 20 seconds, crank and then start. Once the loco is idling, pressing F1 will cause the engine to stop in the normal manner.



## Dapol OO gauge class 68 locomotive DCC Sound users guide.

21  
MTC



2. To shorten the priming sequence, turn F1 off at any time during priming, wait for priming to stop, and then turn F1 back on. The engine will crank and start immediately.
3. Alternatively, the engine sound may be faded in and out automatically by turning F1 on or off *when the loco is moving*. The start-up sequence is missed out in this case and the engine sound will come on at a notch appropriate to the current speed.
4. If the engine has been running and is then shut down, all subsequent starts will be 'warm' (ie without engine priming) as the engine is already primed.

### Driving technique

The loco can be moved around at slow speed with the engine at idle by opening the throttle to a low speed setting and leaving it there. The revs will increase and then die back to idle. There are four different departure sound sequences from 'gentle' to 'full thrash' depending upon how wide the throttle is opened from stationary. Open the throttle to the desired speed and leave it there, letting the inertia do the rest. The throttle setting can be increased or decreased at any time to abort the sequence or transfer to a 'higher' one. When moving at a steady speed, exaggerated movements of the throttle up or down can be used to make the loco 'thrash' or coast. Once triggered, the throttle can be returned to its original setting (if required) to maintain speed. The inertia setting smooths out the throttle variation so that loco movement appears realistic. If the throttle setting is suddenly reduced to trigger the coasting sequence, the loco will remain in coast until you increase the throttle again. In addition to this the drivelock feature can be used to select any engine notch at any speed (see the drivelock description below).

### 'Playable' horns (F2 & F3)

F2 is the high horn tone and F3 the low tone. Turn either function on to play the horn and off again to stop it. This allows you to sound the horns in any manner just like the real loco. Alternatively, DCC controllers can often be set to momentary operation such that the horn only plays whilst the key is held down.

Set SV1 / CV155 to 0 for high horn A  
Set SV1 / CV155 to 1 for high horn B  
Set SV2 / CV156 to 0 for low horn A  
Set SV2 / CV156 to 1 for low horn B

These are directional sounds and only come from the leading loco in either of the train modes.

### 'Auto-buffering' (F4)

When approaching stock to buffer up, press F4 *whilst still moving* to 'arm' the sound. Continue the approach and buffer up, and the sound will occur automatically a split second before the loco comes to a standstill. Releasing F4 before buffering up will disarm the sound and the loco can be brought to a standstill without it. Pressing F4 when stationary will produce the sound of the coupling going onto the hook. This is a directional sound and only comes from the leading loco in either of the train modes.

### Automatic braking & brake dump sound functions (F5)

F5 can be used in three different ways;

1. When the loco is stationary, pressing F5 will produce the sound of the driver 'dumping the brake'.
2. If the loco is decelerating, F5 may be turned on and then off to produce a single brake application sound. There are three different brake application sounds (light, medium and heavy) depending upon the rate of deceleration. This can be repeated any number of times.
3. If F5 is turned on when moving at a steady speed the brake application sounds will be produced automatically *each time the throttle setting is reduced*. This is particularly effective when repeated a number of times when the loco is coasting up to a red signal (for example).

# Dapol OO gauge class 68 locomotive DCC Sound users guide.

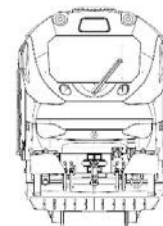


The brake severity can be set by CV 179 (0 minimum – 255 maximum)

## Driver's door slam (F6)

There are three different door slam sounds, one of which is played at random each time F6 is turned on.

This is a directional sound and only comes from the leading loco in either of the train modes.



## Compressor (F7)

Turn F7 on to start the compressor and off again to stop it.

## Drive hold (F8)

The drive hold feature enables the selection of any engine notch at any speed, and is useful to simulate the effect of a very heavy train. Pressing F8 at any speed (including stationary) causes the loco speed to be locked at its current setting. The throttle may then be used to 'drive' the engine sound without affecting the speed of the loco. When F8 is released, the loco speed will slowly come back into line with the throttle setting. F8 may be turned on and off to prolong that process.

**Be aware that if F8 is left on when stationary the loco will respond to function key presses but will not move in response to the throttle and this may cause some confusion!**

## Automatic, variable-speed flange squeal (F9)

Turning F9 on will produce a flange squeal sound proportionate to the current speed of the loco. If turned on when stationary the sound will begin when the loco starts to move and increase in intensity as speed increases. As the loco comes to a standstill the squeal will slow and stop automatically. F9 can be turned on and off at any time and speed to produce a realistic effect over pointwork etc

## Despatch whistle (F10)

Turn F10 on to produce a despatch whistle sound from the platform staff.

This is a directional sound and only comes from the trailing loco in either of the train modes. It is disabled if the train is moving.

## Guard to driver 'right away' signal & optional reply (F11)

Turning F11 on produces a randomised 'beep-beep' signal from the guard to the driver which indicates that it is safe to depart. If F11 is left on, there will also be a randomised reply from driver to guard as an acknowledgement. To select the guard's signal without a reply from the driver, turn F11 on and then off again.

This is a directional sound and only comes from the leading loco in either of the train modes.

## Dynamic braking fan (F12)

Class 68's are equipped with dynamic braking. During heavy braking, resistor banks are used to dissipate energy and slow the train. The resistors are cooled by high-speed fans.

Turning F12 on enables the dynamic braking fan sound. With F12 on, heavy braking (ie large reductions in throttle setting) will cause the fans to start and run automatically until the loco speed has stabilised. They then 'run-on' for a few seconds and stop. The sequence will be repeated if F12 is left on and the loco decelerates again. Turn F12 off again to disable the automatic operation.

The dynamic brake severity can be set by CV 180 (0 minimum – 255 maximum)

## Sanders (F13)

Class 68's are equipped with sanders to improve wheel grip during adverse rail conditions.

Turn F13 on to start the sanders and off again to stop them.

## Halo lights (F14)

See Sound and Lighting Modes

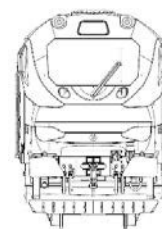


# Dapol OO gauge class 68 locomotive DCC Sound users guide.



## Electric Train Heat (ETH) (F15)

When Class 68's operate with electrically heated coaching stock the engine revs rise when the Electric Train Heat (ETH) is turned on. Turn F15 on to engage the ETH.



## Mk3 'coach wail' (F16)

Class 68's often run with Mk3 coaching stock. This function simulates the 'wailing' sounds heard from the airbag suspension of these vehicles, particularly when negotiating pointwork or curves. Turning F16 on produces a randomised 'wail' at regular intervals to simulate this effect. Turn F16 off again to disable the sound.

## Windscreen wipers (F17)

F17 may be used to play windscreen wiper sounds.

Set SV3 / CV157 to 0 for squeaky windscreen wipers

Set SV3 / CV157 to 1 for quiet windscreen wipers

This is a directional sound and only comes from the leading loco in either of the train modes. It is also disabled if the train is moving.

## Detonators (F18)

F18 is used to simulate the use of three track detonators as an 'emergency stop' indication to the driver, if the line is blocked ahead for example. The three bangs will be closer together the faster the loco is moving.

This is a directional sound and only comes from the leading loco in either of the train modes.

## Train modes (F19 & F20)

See Sound and Lighting Modes

## Parking mode (F21)

See Sound and Lighting Modes

## Cab start sounds (F22)

Cab start sounds (TPWS & AWS warning messages) can be set up to operate automatically when the loco is started or when changing ends. Additionally, F22 may be used to play the cab start sounds on demand at other times if required.

Set SV4 / CV158 to 0 to enable automatic cab start sounds

Set SV4 / CV158 to 1 to disable automatic cab start sounds

This is a directional sound and only comes from the leading loco in either of the train modes. It is also disabled if the train is moving.