## LGB 2043 Ge 4/4 II RhB No. 622 Arosa. Installation instructions for Dietz sound module X-clusive II EL-RHB, Dietz DPS 82 LGB pantograph control and ZIMO MX66V decoder for digital systems (Zimo, Lenz and others, not LGB-MZS):

**Important:** the reconstruction is at your own risk! My documentation is only intended as a suggestion. There are certainly other or better solutions. The design of the components can also be designed as desired.

## 1. Disassembly:

Dismantle the gear units, locomotive body and roof; the exploded view 2043-1 from the LGB Service Parts CD-ROM V 1.2 can be very helpful for this.

The locomotive still has the 3-pin analog gear, which can be easily changed. In my toolbox I still had 2 D gear units from an F7 that were used.



## 2. Gearbox modification:

Remove the side panels and the upper gearbox cover from the F7 D gearbox units, put on the frames of the Ge 4/4 II and drill a fourth Ø 1.5 mm hole in the upper Ge 4/4 II cover in the correct position.

Screw the upper gearbox cover back on and you're done.



## 3. Installation of the LGB pantograph control DPS 82 from Dietz:

Here you have to decide whether both pantographs should be controlled with one function or each one individually with 2 functions. In the first case, the **red** and **black** cables on the rear pantograph on the motor drive must be swapped so that when one is lowered the other goes up.



Overall view of the pantograph control



# 4. Install DPS 82:

Cut a 55.0 x 25.0 mm opening in the middle of the roof.

Fix the circuit board with double-sided adhesive tape, attach it with a fast-curing 2K epoxy adhesive (e.g. Araldit Rapid) and secure the cables (strain relief).





## 5. P.-drive front:

Remove all LGB cable connections except for the gray cable and connect diodes and a **blue** double cable according to the sketch in the Dietz instructions .

Then secure with a fast-curing 2K epoxy adhesive (e.g. Araldit Rapid).

Purpose: strain relief.



## 6. P.-drive rear:



Remove all LGB cable connections except for the gray cable and, contrary to the sketch in the Dietz instructions, solder the diodes offset by 180° and connect a **blue** double cable.

Do not change motor connection for 2 functions!

Then secure with a fast-curing 2K epoxy adhesive (e.g. Araldit Rapid).

Purpose: strain relief.

### 7. P.-Final assembly:

One green cable is connected to the current collector on the left, the other green cable to the current collector on the right of the Zimo decoder, one grey cable to the function output right 2 (F1) and the other grey cable to the function output right 3 (F2) of the ZIMO decoder.







### 8. Speaker placement:

Cut out a Ø 50.0 mm opening in the middle of the housing roof. Pre-fix the loudspeaker to the inside of the housing using superglue.





### 9. Install the speakers:

To make the speaker in three-stroke Ø 2.4 mm holes, attach small 3.0 mm thick pads to the holes with superglue and fasten them with screws with washers.

Solder 2  $\ensuremath{\textbf{purple}}$  cables , each approx. 200 mm long .



# 10. LGB Lighting 1 + 2:

The 2 LGB boards illuminate the roof spotlights and the driver's cab at the same time!



## 11. Make changes:

Disconnect the conductor track (red **arrow)**, remove the solder mask and solder on a cable approximately 200 mm long.



# 12. Installation of the lighting:

Insert both modified circuit boards into the housing, fix them with insulating tape and secure the cables with a fast-curing 2K epoxy adhesive (e.g. Araldit Rapid).

Assignment: **Blue** cable = common + pole. Yellow cable = - pole driver's cab lamp. Gray cable = - pole roof light.



# 13. LGB lighting 3 + 4:

The 2 LGB boards are designed for analog operation and must be modified for digital operation.

Remove all cables on the soldering side.



Rotate the diode by 180° ( blue **arrow)**. On a circuit board, the LED cathodes (flat spot, hook shape) point outwards. Move the cathodes 180° inwards ( red **arrow)**.







# 15. Soldering the lighting cable:

Blue cable = common + pole. Grey cable = headlamps - pole Brown cable = G1 socket. Red cable = LED - pole W⊛isses Cable = ©2 Power outlet. separation points ( red arrows). Connection + pole (arrow light blue).

# 16. Lighting boards:

View of the front of the lighting board changed from analog to digital system.

LED - cathode side ( red arrows)



Then secure all cables at the soldering points with a fast-curing 2K epoxy adhesive (e.g. Araldit Rapid) and reinsert the lighting boards into the locomotive housing.

# 18. Install ZIMO MX66V decoder and Dietz X-clusive II EL-RHB sound module:



Screw the decoder onto the weight using 10.0 mm long plastic sleeves and the sound module using 5.0 mm long plastic sleeves. To do this, 8 holes with a diameter of 2.4 mm must be drilled at the same distance between the holes in the modules. Use a multimeter to set the potentiometer for setting voltage on the decoder to 5 to max. 7 volts.



### 19. Connections:

Connect motor current M1 thicker cable yellow + M2 thicker cable green and track current thicker cable + G2 thicker cable from to the decoder. Wells Program the decoder and carry out a test run

**Important:** if the locomotive reverses when in the forward position, swap the cables M1 and M2 on the decoder!

### 20. Manufacture additional board for short-term power supply:

This additional board does not need to be made if the power supply can be dispensed with during short-term interruptions, such as those that can occur when the switch frogs are de-energized or the tracks are dirty.

The circuit diagram is on the Dietz A5 manual noise modules X-clusive II on page 6

The following components are required for the power supply: 1x rectifier B 40/

C 1500, 1x resistor R 5 to 15 Ohm, 1x diode 1N4002, 1x capacitor 2200 to 4700ÿF/35V and a piece of a Euro board measuring approx. 40 x 20 mm. All available from Conrad.



### 21st connection:

Green cable = + G2@chnection.

Orange cable = + pole sound module. Brown cable = - pole sound module.



# 22. Make lighting, sound and pantograph connections:

Important: Insulate all connection points with shrink tubing!

### Lighting:

Connect **the green** cables (poles separated!) and connect to **G2** rail power. Connect **blue** cables and connect to decoder setting voltage (positive pole) for function outputs. Connect the **grey** cable lighting I to the **red** cable lighting II and to the decoder lamps front FLf. Connect the **grey** cable lighting II to the **red** lighting I and to the decoder lamps rear FLr. Connect **yellow** cable driver's cab I to decoder function output left-1 (F7). Connect **yellow** cable driver's cab II to decoder function output left-2 (F8).

### sound module:

Connect red cables to decoder motor connection left + right (connector strip). Connect green cable to decoder current collector connection left + right (connector strip). Connect brown cable 1 to decoder GROUND . Connect brown cable 2 to the additional board negative pole . Connect the orange cable to the positive pole of the additional board. Eliminate gray cables 1 and 2 (USA announcement and DB horn). Connect grey cable 3 to decoder function output right 6 (F5) (RhB whistle). Connect grey cable 4 to decoder function output right 5 (F4) (conductor signal, announcement, signal box). Connect black cable 5 to decoder function output right 4 (F3). Weisses Connect cable 6 to decoder function output (F6) (fatileChts 7 Violet cables to speaker positive and negative poles.

### Pantographs:

Connect the grey cable from the DPS 82 module pantograph 1 to the decoder function output right 2 (F1). Connect the grey cable from the DPS 82 module pantograph 2 to the decoder function output right 3 (F2). Important: Cable 1 or 2 must be tested first!

### 23. View of the finished connections:





The finished locomotive of my brother Sepp on my garden on September 24, 2003.

#### 24. Install the locomotive housing:

Tie the cables together with cable ties, put the housing on and screw it tight.

### 25. Functions on the ZIMO MX2 hand controller:

MX2 button:	Function:	Noise:
Button 1 - DFM	F0: Light On / Off	
button 2 - DFM	F1: Pantograph I raise / lower	
button 3 - DFM	F2: Raise / lower Pantograph II	
button 4 - DFM	F3:	Idle noise on / off
button 5 - MFM	F4: press briefly F4: long press F4: when the locomotive is running	conductor's whistle announcement brake squealing
button 6 - MFM	F5:	RhB locomotive whistle
button 7 - MFM	F6:	fan noise
Key 8 - DFM	F7: Light On / Off	Driver's cab I
key 9+L - DFM	F8: Light On / Off	driver's cab II

#### Legend:

DFM = continuous function mode MFM = Momentary Function Mode

#### 26. Conclusion:

The excellent driving characteristics of the Zimo MX66V decoder are particularly evident in this locomotive. and the soundscape of the Dietz X-clusive II sound module is really impressive.



On the next page, a subsequent modification has been documented for experienced soldering specialists.

# 27. Make an external volume control:

ATTENTION: This modification should only be carried out by model railroaders experienced in soldering technology, as any intervention in the sound module will void all warranty claims against Dietz in Höfen !



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## 28. Procedure:

The volume potentiometer is carefully desoldered from the sound module and three approx. 100 mm long cables are soldered in its place.

Then secure all cables at the soldering points with a fast-curing 2K epoxy adhesive (e.g. Araldit Rapid).

Drill a 5.0 mm diameter hole through both frames, aiming at the clearance in the battery box.

Pull the cable through.





Solder the potentiometer onto a small Euro board and connect the cables in the correct position.

Drill a 5.0 mm diameter hole in the battery box front and attach the potentiometer in the correct position on the Euroboard side using a fast-curing 2K epoxy adhesive (e.g. Araldit Rapid).

This gives you a volume control that is easily accessible from the outside.









