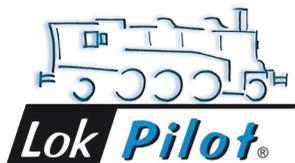
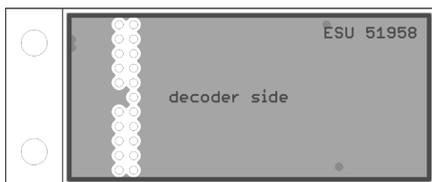
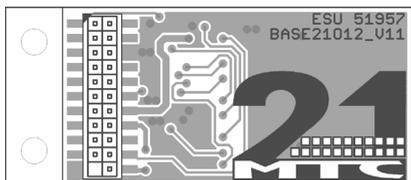
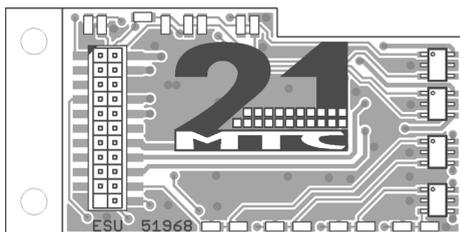


Adapterboard

Installation and operating instructions

1. Auflage, März 2018

- 51968 Adapter board for 21MTC interface, »L-shape«, with cables
- 51957 Adapter board for 21MTC interface, small design, with cables
- 51958 Adapter board for PluX22 interface, small design, with cables



P/N 00818-19857



1. Declaration of conformity

We, ESU electronic solutions ulm GmbH & Co. KG, Edisonallee 29, D-89231 Neu-Ulm, declare under our sole responsibility that the products

51968 Adapter board for 21MTC interface, »L-shape«, with cables
51957 Adapter board for 21MTC interface, small design, with cables
51958 Adapter board for PluX22 interface, small design, with cables

This information is consistent with the following standards :

EN 71 1-3: 1988/6: 1994 - EN 50088: 1996 - EN 55014, Part 1 + Part 2: 1993

EN 61000-3-2: 1995 - EN 60742: 1995 - EN 61558-2-7: 1998 in accordance with the provisions of the Directive

88/378 / EEC - 89/336 / EEC - 73/23 / EEC

2. WEEE statement

Disposal of old electrical and electronic equipment (valid in the European Union and other European countries with separate collection system)



This symbol on the product, the packaging or in documentation means that this product is not household waste and should be treated differently. Instead, take this product to the appropriate disposal point for the recycling of electrical and electronic equipment.

If the product is disposed of correctly, it helps to prevent negative environmental influences and damage to health, which could be caused by improper disposal. The Recycling of material will preserve our natural resources. For more information about recycling this product please contact Your local recycling center or the shop in which you bought this product.

3. Important Information - Please read first

Congratulations on purchasing an ESU adapter board for the 21MTC or PluX22 interface. This manual will help you to understand the possibilities of the adapter board step by step. Therefore a request: Please work through this manual carefully before putting it into operation. Although the board is very robust, a wrong connection could lead to the destruction of the connected decoder. If in doubt, avoid "expensive" experiments

The adapter board is designed exclusively for use with electric model railway systems. It may only be operated with the components described in this manual. Use other than those described in this manual is not permitted.

- All connection work may only be carried out when the operating voltage is switched off.
- Follow the principles of this manual when connecting the board and decoder.
- Avoid shock and pressure loads on the adapter board.

- Protect from moisture
- No cable may ever touch metal parts of the locomotive.
- When assembling the locomotive make sure that no cables are trapped or damaged as short circuits will occur.

4. General characteristics

The adapter board is intended for use in model locomotives . With their help, it is possible to digitize older locos. On the one hand, the board offers a slot for decoders with the 21MTC interface , on the other hand, all cable connections from the locomotive to the board can be soldered clean . The adapter board favors a clean , professional conversion for the locomotives , in particular the HAG® and Märklin® brands.

- For use with appropriate ESU decoders with 21MTC or PluX22 interface
- Installation in two- and three-wire locomotives possible.
- Clean cabling in the locomotive through soldering points.
- Pre-wired with the main cables, 30cm, in length.
- All possible outputs of the decoder are accessible; in the versions with 21MTC interface, all outputs from AUX3 are amplified by transistors. Each output has 250mA of power, regardless of the decoder.

4.1. Adapter board 51968 - 21MTC in "L-shape"

The adapter board for decoders with 21MTC interface replaces any existing electronics in the locomotive. The shape of the board was chosen so that it can replace any existing 6090x decoder and can easily be clipped into its retaining plate. Up to 12 function outputs are available, amplified from AUX3 with MOS-Fets

4.2. Adapter board 51957 - 21MTC »small design«

This decoder PCB with 21MTC interface requires little more space than the decoder itself. Up to 12 function outputs are available, from AUX3 with MOS-FETs amplified

4.3. Adapter board 51958 - PluX22 »small design«

This PCB for decoders with PluX22 interface requires little more installation space than the decoder itself. Up to 9 function outputs are available. It is also possible to plug in decoders with PluX16 interface , if you can do without some functions.

4.4. Existing function outputs

All three PCBs have solder connections or cables for up to 12 functions. However, not all functions can always be used. It is also decisive which functions the decoder supports. In some cases, outputs may not be used on certain decoders. The following table gives information:

Ausgang	Pin 21MTC	51968 21MTC	51957 21MTC	Bemerkungen (21MTC)	Pin PluX22	51958 PluX22	Bemerkungen (PluX22)	Anschluss
Licht Vorne	8	Ok	Ok	vom Decoder	7	Ok		Kabel, weiß
Licht Hinten	7	Ok	Ok	vom Decoder	13	Ok		Kabel, gelb
AUX1	15	Ok	Ok	vom Decoder	16	Ok		Kabel, grün
AUX2	14	Ok	Ok	vom Decoder	18	Ok		Kabel, violett
AUX3	13	Ok	Ok	MOS-FET, 250mA	2	Ok		Lötanschluss
AUX4	4	Ok	Ok	MOS-FET, 250mA	19	Ok		Lötanschluss
AUX5	17	Ok	Ok	MOS-FET, 250mA	20	Ok		Lötanschluss
AUX6	3	Ok	Ok	MOS-FET, 250mA	21	Ok		Lötanschluss
AUX7	2	Ok	Ok	MOS-FET, 250mA nicht LokSound, LokPilot V4	22	Ok	nicht LokSound, LokPilot V4	Lötanschluss
AUX10	1	Ok	Ok	MOS-FET, 250mA nicht LokSound, LokPilot V4				Lötanschluss
AUX11	6	Ok	Ok	MOS-FET, 250mA nicht LokSound, LokPilot V4				Lötanschluss
AUX12	5	Ok	Ok	MOS-FET, 250mA nicht LokSound, LokPilot V4				Lötanschluss

5. Installation requirements

The locomotive must be in perfect technical condition before conversion: Only one locomotive with faultless mechanics and a clean analogue run may be digitized. Wear parts such as motor brushes, wheel contacts, bulbs etc. must be checked and possibly cleaned or replaced.

All installation work must always be carried out on de-energized vehicles taken from the track . Make sure that no voltage - even accidentally - can reach the locomotive during the conversion.

5.1. Installing the adapter board

The illustrations on the following page show the general connection for the three printed circuit boards . For almost all functions , cables are already attached to the board, only from AUX3 and the speaker pins you will find the matching soldering pads on the underside of the PCB.

- When using LEDs, pay attention to their polarity.
- If your vehicle is equipped with two motors, the two motors must be connected in parallel.
- Always observe the permissible total current load capacity of the decoder

5.2. Suitable decoder

Basically, you can use any decoder that complies with the following standards:

For 21MTC: VHDM RCN-121 or NEM660.

For PluX22: VHDM RCN-122

! Unfortunately, some decoders on the market do not follow the NEM660 or RCN-121 standard offered by ZIMO and Märklin®. Contrary to the norm , these decoders have amplified the outputs AUX3 and AUX4 so that they can not be used with the adapters 51968 and 51957!

Even if a decoder o.g. It does not say that all the outputs on the adapter board are also available on the decoder: The standards do not say that a decoder must offer all the outputs: So only the outputs to AUX6 are available on the LokSound V4 decoder. Always follow the instructions of your decoder and set the function outputs appropriately.

5.3. Insert the decoder for 21MTC interface

The decoder is plugged onto the adapter board as shown in Figure 2 and is thus completely connected

! Make sure that the 21MTC socket of the decoder points upwards. The pins of the adapter board are inserted through the decoder board into the decoder socket. Do not use force when plugging in!

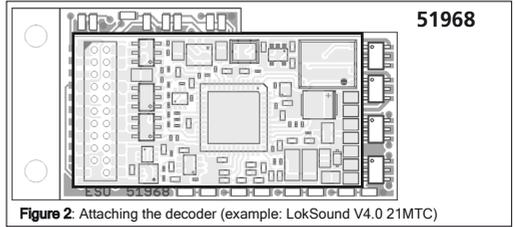


Figure 2: Attaching the decoder (example: LokSound V4.0 21MTC)

5.4. Inserting the decoder for PluX22 interface

The decoder is plugged onto the adapter board as shown in Figure 3 . You can also plug in decoders with PluX 16 interface into the adapter board 51958.

! Make sure that the index pin 11 of the PluX interface matches the missing pins of the decoder, if you plug in a decoder with a smaller interface . Decoders with PluX 16 interface are plugged in offset . The pins of the decoder are inserted through the adapter board into the socket. Do not use force when plugging in!

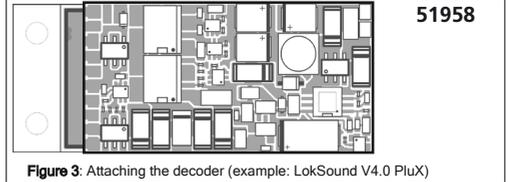


Figure 3: Attaching the decoder (example: LokSound V4.0 PluX)

5.5. color scheme

Most locomotive manufacturers are now adhering to the DCC color scheme of the NMRA. In particular, Märklin® locomotives use a different color scheme, which must not be confused.

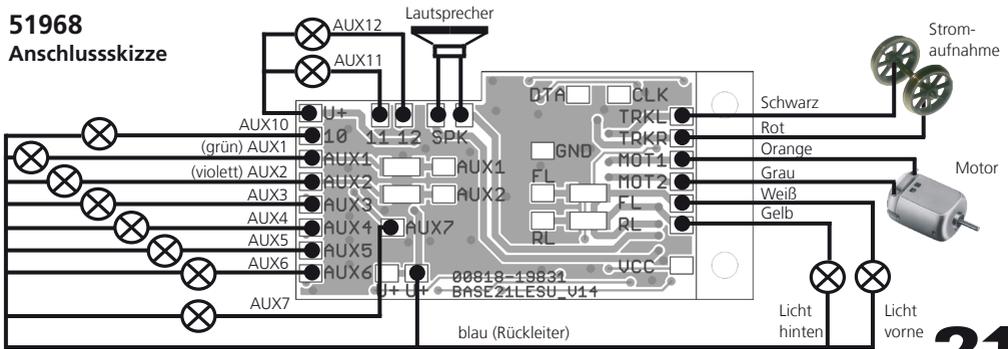
A detailed explanation can be found in the table below.

6. Testing the conversion

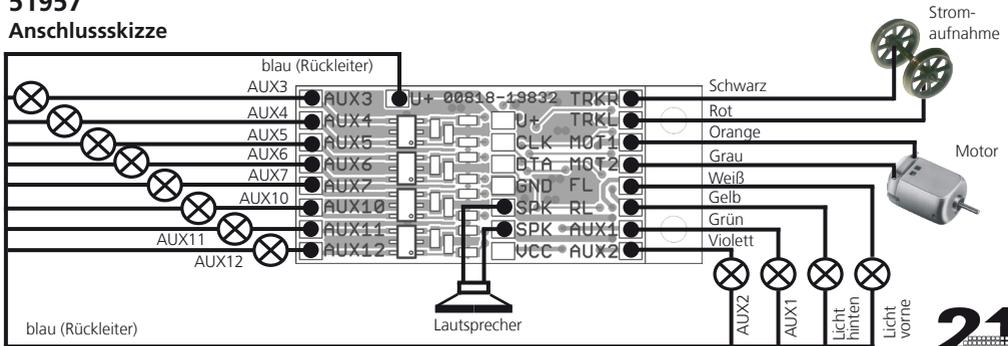
After installation , you must check the function . In order to minimize the risk of decoder destruction due to incorrect connection or short circuit, we recommend that you carry out the first tests of the newly converted locomotive on the test stand of the locomotive programmer or on the programming track of the digital central unit.

Name	Bezeichnung		Märklin® Farbe	DCC Farbe
TrkR	DC: Schiene Rechts	AC: Mittelleiter	Rot	Red
TrkL	DC: Schiene Links	AC: Außenleiter (Schiene)	Braun	Black
MOT1	Motorausgang links		Blau	Orange
MOT2	Motorausgang rechts		grün	Grey
U+	Gleichgerichtete Decoderspannung (Rückleiter für Funktionen)		orange	Blue
GND	Decodermasse (nach den Gleichrichterdioden)			
FR	Ausgang Licht Hinten		gelb	Yellow
RL	Ausgang Licht Vorne		grau	White
AUX1	Ausgang AUX1		Braun/rot	Green
AUX2	Ausgang AUX2		Braun/grün	Violet
AUX3	Ausgang AUX3		Braun/gelb	
AUX4	Ausgang AUX4		Braun/weiss	
AUX5	Ausgang AUX5			
AUX6	Ausgang AUX6			
AUX7	Ausgang AUX7			
AUX10	Ausgang AUX10			
AUX11	Ausgang AUX11 (auf den SUSI-Pins, Ausgang passend konfigurieren)			
AUX12	Ausgang AUX12 (auf den SUSI-Pins, Ausgang passend konfigurieren)			
SPK	Lautsprecher links			
SPK	Lautsprecher rechts			
CAP+	Additional buffer capacitor (up to 1000uF / 25V): only 51958			
VCC	Supply voltage. Typically 5V from the decoder voltage regulator. Can only be loaded with max. 5 - 10 mA. Observe the decoder instructions!			
CLK / DTA	SUSI cables that can be used as an alternative to AUX11 / AUX12. If SUSI is active, please do not connect anything to the outputs. Observe the decoder instructions.			

51968 Anschlusskizze



51957 Anschlusskizze



51958 Anschlusskizze

