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tams elektronik 70-01045 Interface Adapter User Guide

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Adapter User Guide**

Adapter for PluX22- and 21MTC-Interface

Manual

Item number 70-01045

PluX22
NEM 658 | RCN-122

NEM 660 | RCN-121

tams elektronik

Version 2.0 | Status: 10/2023

Printing the manual
The formatting is optimised for double-sided printing. The standard page size is DIN A5. If you prefer a larger display, printing on DIN A4 is recommended.

Contents

1. Getting started

This manual gives step-by-step instructions for safe and correct assembly of the kit and fitting and connecting of the adapter, and operation. Before you start, we advise you to read the whole manual, particularly the chapter on safety instructions and the checklist for trouble shooting. You will then know where to take care and how to prevent mistakes which take a lot of effort to correct. Keep this manual safely so that you can solve problems in the future. If you pass the kit or the ready-built adapter on to another person, please pass on the manual with it.

1.1. Contents of the package

- one adapter PCB
- one 22-pole plug connector for use as MTC-interface

1.2. Accessories

To assemble the kit you will need

- a soldering iron with temperature control and a thin tip and a deposit stand or a controlled soldering station
- a scraper, rag or sponge
- a heat-resistant pad
- a small pair of side cutters and wire strippers
- tweezers and flat-nose pliers if necessary
- electronic solder (preferably 0.5 to 0.8 mm diameter)

Connection cables
The use of stranded wire is recommended for making the connections. Stranded wires consist of several thin individual wires and are therefore more flexible than rigid wires with the same copper cross-section.
Recommended cross-sections:
m 0.04 to 0.10 mm² (depending on the load)

1.3. Intended use

The adapter is intended for use in model construction, especially in model railway layouts, according to the specifications in the manual. Any other use is not in accordance with the intended use and will result in the loss of the warranty claim. Intended use also includes reading, understanding and following all parts of the instructions. The adapter is not intended to be used by children under the age of 14.

2. Operation overview

The adapter is used to upgrade vehicles with a PluX or MTC interface interface. There is a 22pole socket soldered on to the adapter PCB which is used to insert the plug connector of the decoder-sided PluX interface. In order to connect the adapter to the the decoder-sided MTC interface, the extra 22-pole plug connector has to be inserted into the adapter PCB.

2.1. Background information

	PluX interfaces	MTC interfaces
Standard	NEM 658 / RCN-122	NEM 660 / RCN-121
Number of pins	12, 16 or 22	22
Plug connector	on the decoder	in the vehicle
Socket	in the vehicle	on the decoder

PluX interfaces for different gauges
PluX-interfaces have 12, 16 or 22 connector pins and that way are suitable to be mounted in t vehicles of different gauges (or with varying space requirements). The assignment of the different versions allows to insert a plug connector with 12 or 16 connector pins into a socket k with a larger number of connections.
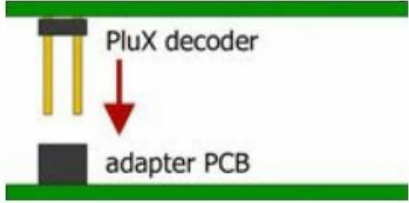**Index-pin**
For both types of interfaces the position of an index-pin which should not be used has been e defined. By means of the index-pin you can distinguish the direction for inserting the plug connector into the socket. At the position of the plug connector in question the pin should be s removed.
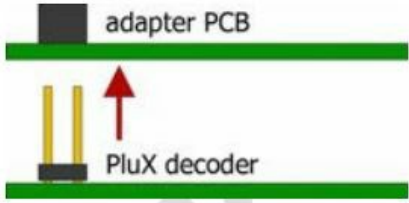
2.2. Mounting versions

The (PluX- or MTC-) vehicle decoder can be inserted as well from the top as from the bottom a into the adapter PCB. The assignment of the PCB´s contacts depends on the direction of t inserting the decoder.

2.3. Mounting versions for PluX decoders

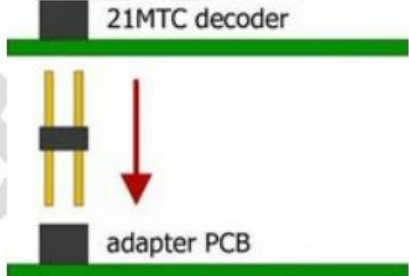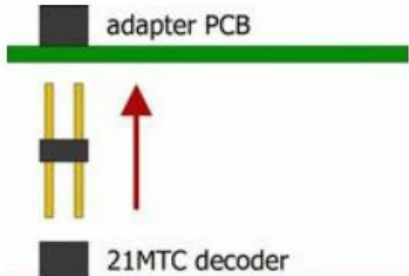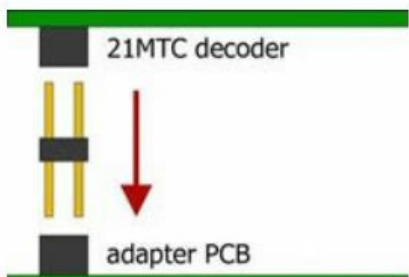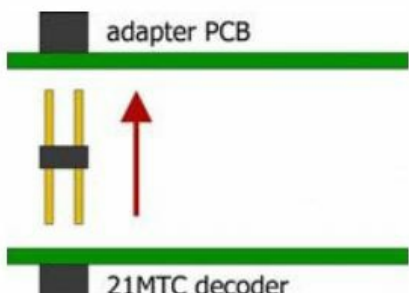|	
Mounting version 1: Inserting direction of the decoder: from above	PluX decoder ↓ adapter PCB
Mounting version 2: Inserting direction of the decoder: from below	adapter PCB ↑ PluX decoder

2.4. Mounting versions for MTC decoders

Mounting version 1 a: Inserting direction of the decoder: from above **+** Socket terminal strip of the decoder on top	21MTC decoder ↓ adapter PCB
Mounting version 1 b: Inserting direction of the decoder: from below **+** Socket terminal strip of the decoder on top	adapter PCB ↑ 21MTC decoder
Mounting version 2 a: Inserting direction of the decoder: from above **+** Socket terminal strip of the decoder at the bottom	21MTC decoder ↓ adapter PCB
Mounting version 2 b: Inserting direction of the decoder: from below **+** Socket terminal strip of the decoder at the bottom	adapter PCB ↑ 21MTC decoder

3. Assembling the kit

3.1. Safety instructions

Mechanical hazards
Cut wires can have sharp ends and can cause serious injuries. Watch out for sharp edges when you pick up the PCB. Visibly damaged parts can cause unpredictable danger. Do not use damaged parts: recycle and replace them with new ones.

Fire risk
Touching flammable material with a hot soldering iron can cause fire, which can result in injury or death through burns or suffocation. Connect your soldering iron or soldering station only when actually needed. Always keep the soldering iron away from inflammable materials. Use a suitable soldering iron stand. Never leave a hot soldering iron or station unattended.

Thermal danger
A hot soldering iron or liquid solder accidentally touching your skin can cause skin burns. As a o precaution: r use a heat-resistant mat during soldering, t always put the hot soldering iron in the soldering iron stand, k point the soldering iron tip carefully when soldering, and le remove liquid solder with a thick wet rag or wet sponge from the soldering tip.

Dangerous environments
A working area that is too small or cramped is unsuitable and can cause accidents, fires and s injury. Prevent this by working in a clean, dry room with enough freedom of movement.
Other dangers Children can cause any of the accidents mentioned above because they are inattentive and m not responsible enough. Children under the age of 14 should not be allowed to work with this kit or the ready-built device.

⚠ Caution:
Little children can swallow small components with sharp edges, with fatal results! Do not allow components to reach small children.
In schools, training centres, clubs and workshops, assembly must be supervised by qualified personnel. In industrial institutions, health and safety regulations applying to electronic work must be adhered to.

3.2. Safe and correct soldering

⚠ Caution: Incorrect soldering can cause dangers through fires and heat. Avoid these dangers by reading and following the directions given in the chapter Safety instructions.

- Use a soldering iron with temperature control, which you set to approx. 300 °C.
- Only use electronic solder with a flux.
- Never use soldering fluid or soldering grease when soldering electronic circuits. These contain an acid that destroys components and conductor paths.
- Solder quickly: Soldering for too long can detach solder pads or tracks or even destroy components.
- Hold the soldering tip on the soldering point so that it touches the wire and the pad at the ik same time. Add (not too much) solder simultaneously. As soon as the solder begins to flow, remove it from the soldering point. Then wait a moment for the solder to flow well before removing the soldering iron from the soldering joint.
- Do not move the created solder joint for about 5 seconds.
- A clean, non-oxidized soldering tip is essential for a perfect soldering joint and good r soldering. Therefore, before each soldering, wipe off excess solder and dirt with a damp t sponge, a thick damp cloth or a silicone wiper.
- After soldering, check (preferably with a magnifying glass) whether connections or tracks have been bridged with solder by mistake. This can lead to malfunction or destruction of le components or, in the worst case, the

complete circuit. You can re-liquefy excess solder with the clean hot soldering tip. The solder then flows from the board onto the soldering s e tip. tam

3.3. Soldering on the cables

Solder the connecting cables on the top side of the adapter PCB. Observe the different assignments for PluX and MTC interfaces and the different mounting versions.
It is recommended to use cables of different colours according to NEM 658 or NEM 660 in order to avoid mistakes when connecting the adapter PCB.

Perform a visual check!

After having soldered the cables you should perform a visual check and remedy defects.

- Check if soldering joints closely adjoining are connected to each other by accident. Risk of short circuit!
- Check if you have assigned the connecting cables on the adapter PCB properly to the connections of the decoder.

⚠ Caution:
Confusing the connections can cause damages at the deocder and/or at the vehicle. For that reason you should be very attentive when assigning the connections.
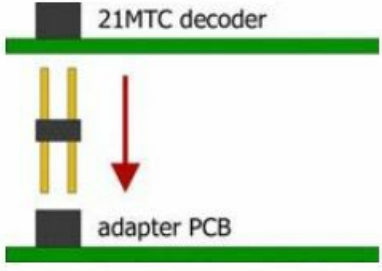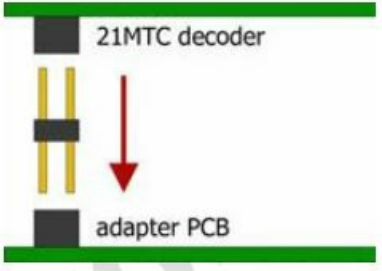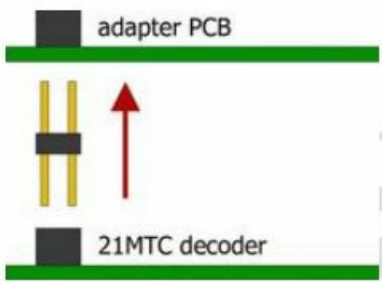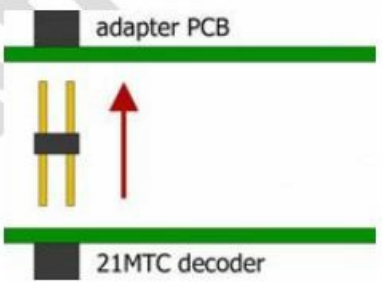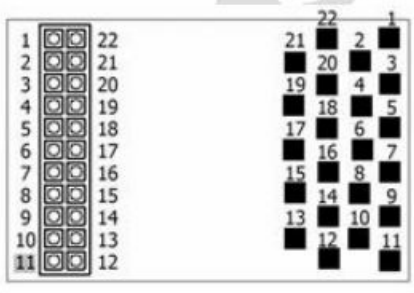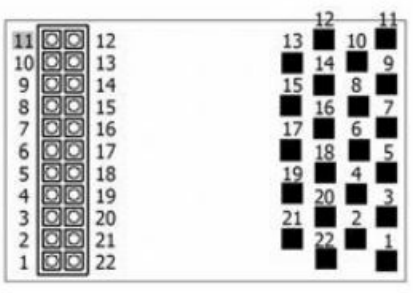
3.4. Assignment for PluX adapters (NEM 658/RCN-122)

Figure: Top side of the adapter PCB
Assignment for use according to PluX (NEM 658 / RCN-122)
11 = Index-Pin

Pin	Name	Description Plux adapter	Cable colour
1	GPIO/C	Universal input/output	
2	AUX3	Output 3	
3	GPIO/B	Universal input/output, train-bus pulse	
4	GPIO/A	Universal input/output, train-bus data	
5	GND	Decoder ground, pick-off after rectifier	
6	V+ Cap.	Decoder plus, pick-off after rectifier, connection storage capacitor	blue
7	F0f	Lighting forward direction	white
8	Motor 1	Motor connection 1 (+) / forwards	orange
9	V+	Decoder plus, pick-off after rectifier	blue
10	Motor 2	Motor connection 2 (-) / backwards	grey
11	Index	not in use, coding	
12	Rails 1	Current collector right in forward direction of motion	red
13	F0r	Lighting backward direction	yellow
14	Rails 2	Current collector left in forward direction of motion	black
15	LS/A	Loudspeaker connection A	
16	AUX1	Output 1	green

(Left side vertical label: **PluX adapter**)

3.5. Assignment for 21MTC adapters (NEM 660/RCN-121)

In order to avoid damage due to a connection of the decoder with reversed polarity, you sould remove the index pin (pin 11) at the 22-pole plug connector. You can withdraw the pin with small pliers.

	Mounting version 1 (a and b) Socket terminal strip of the decoder on top	Mounting version 2 (a and b) Socket terminal strip of the decoder at the bottom
MTC adapter	**1a**	**2a**
	1b	**2b**

Figure: Top side of the adapter PCB

Assignment for use according to 21MTC (NEM 660 / RCN-121)

11 = Index-Pin

Pin	Name	Description MTC adapter	Cable colour
1	Input1	Sensor input 1	
2	Input2	Sensor input 2	
3	AUX6	Output 6	
4	AUX4	Output 4	
5	ZBCLK	Pulse generator train bus	
6	ZBDTA	Data train bus (TxD, RxD)	
7	F0r	Lighting forward direction	yellow
8	F0f	Lighting backward direction	white
9	LS/A	Loudspeaker connection A	brown
10	LS/B	Loudspeaker connection B	brown
11	Index	not in use, coding	
12	Vcc	Internal decoder voltage 1,8 – 5,7 volts	
13	AUX3	Output 3	
14	AUX2	Output 2	violet
15	AUX1	Output 1	green
16	V+	Decoder plus, pick-off after rectifier, connection storage capacitor	blue
17	AUX5	Output 5	
18	Motor2	Motor connection 2 minus / backwards	grey
19	Motor1	Motor connection 1 plus / forwards	orange
20	GND	Decoder ground, pick-off after rectifier	
21	Rails left	Rails left in forward direction of motion	black
22	Rails right	Rails right in forward direction of motion	red

(MTC adapter)

4. Checklist for troubleshooting and error correction

⚠ Warning: If you notice a strong heat development, immediately disconnect the connection to the supply voltage. Fire hazard!

Possible causes:

- The connecting cables on the PCB are badly assigned to the connections of the decoder or the vehicle. à Perform a visual check and remedy defects. Damage on the decoder or the vehicle cannot be excluded.
- The plug connector or the socket have been inserted the wrong way. à Check the connections and remove the

index pin to avoid mistakes like these.

You cannot switch function outputs of the decoder.
Possible causes: n The connecting cables have not been soldered properly. à Check the soldering joints.
The cables on the PCB have not been assigned properly to the decoder / the connections in
o the vehicle. à Check the connections. r The plug connector or the socket have been inserted the wrong way. à
Check the t connections and remove the index pin to avoid mistakes like these. k

4.1. Technical Hotline

If you have any questions about the use of the adapter, our technical hotline will help you e (telephone number and e-mail address on the last page).

4.2. Repairs

You can send us a defective adapter for inspection / repair (address on the last page). Please do not send us your return freight collect. In the event of a warranty or guarantee claim, we m will reimburse you for the regular shipping costs.

Please enclose the following with your shipment

- proof of purchase as evidence of any warranty or guarantee claim
- a brief description of the defect
- the address to which we should return the product(s)
- your email address and/or a telephone number where we can reach you in case of queries.

Costs
The inspection of returned products is free of charge for you. In the event of a warranty or guarantee claim, the repair and return are also free of charge for you.
If there is no warranty or guarantee case, we will charge you the costs of the repair and the costs of the return. We charge a maximum of 50% of the new price for the repair according to our valid price list.

Carrying out the repair(s)
By sending in the product(s), you give us the order to inspect and repair it. We reserve the right to refuse the repair if it is technically impossible or uneconomical. In the event of a warranty or guarantee claim, you will then receive a replacement free of charge.

Cost estimates
Repairs for which we charge less than 25.00 per item plus shipping costs will be carried out without further consultation with you. If the repair costs are higher, we will contact you and carry out the repair only after you have confirmed the repair order.

5. Technical data

Electrical properties

Maximum current per connection pin	1,000 mA0

Protection

Protection class	IP 00 Meaning: No protection against foreign bodies, contact and water.

Environment

	For use in closed rooms
Ambient temperature during operation	0 ~ + 30 °C
Permissible relative humidity during operation	10 ~ 85% (non-condensing)
Ambient temperature during storage	- 10 ~ + 40 °C
Permissible relative humidity during storage	10 ~ 85% (non-condensing)

Other features

Dimensions (approx.)	Circuit board: 15 x 24 mm
Weight (approx.)	Assembled board without connection cables: 1.3 g

6. Warranty, EU conformity & WEEE

6.1. Guarantee bond

For this product we issue voluntarily a guarantee of 2 years from the date of purchase by the first customer, but in maximum 3 years after the end of series production. The first customer is the consumer first purchasing the product from us, a dealer or another natural or juristic person reselling or mounting the product on the basis of self-employment. The guarantee exists supplementary to the legal warranty of merchantability due to the consumer by the seller.

The warranty includes the free correction of faults which can be proved to be due to material failure or factory flaw. With kits we guarantee the completeness and quality of the components as well as the function of the parts according to the parameters in not mounted state. We guarantee the adherence to the technical specifications when the kit has been
ik assembled and the ready-built circuit connected according to the manual and when start and
mode of operation follow the instructions.
n We retain the right to repair, make improvements, to deliver spares or to return the purchase
price. Other claims are excluded. Claims for secondary damages or product liability consist
o only according to legal requirements. r Condition for this guarantee to be valid, is the adherence to the manual.
In addition, the t guarantee claim is excluded in the following cases:

- if arbitrary changes in the circuit are made,
- if repair attempts have failed with a ready-made module or device,
- if damaged by other persons,
- if damaged by faulty operation or by careless use or abuse. s

6.2. EU Declaration of Conformity

$C\!\!\in$ This product fulfils the requirements of the following EU directives and therefore bears the CE marking. 2001/95/EU Product Safety Directive 2015/863/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) 2014/30/EU on electromagnetic compatibility (EMC Directive). Underlying standards: DIN-EN 55014-1 and 55014-2: Electromagnetic compatibility – Requirements for household appliances, electric tools and similar electrical appliances. Part 1: Emitted interference, Part 2: Immunity to interference
To maintain electromagnetic compatibility during operation, observe the following measures:
ik Only connect the supply transformer to a professionally installed and fused earthed socket.
Do not make any changes to the original components and follow the instructions, connection and assembly diagrams in this manual exactly.
Only use original spare parts for repair work.

6.3. Declarations on the WEEE Directive

This product is subject to the requirements of the EU Directive 2012/19/EC on Waste Electrical
k and Electronic Equipment (WEEE), i.e. the manufacturer, distributor or seller of the product le must contribute to the proper disposal and treatment of waste equipment in accordance with
EU and national law. This obligation includes

- registration with the registering authorities ("registers") in the country where WEEE is s distributed or sold
- the regular reporting of the amount of EEE sold
- the organisation or financing of collection, treatment, recycling and recovery of the products
- for distributors, the establishment of a take-back service where customers can return WEEE a free of charge
- for producers, compliance with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive.

The "crossed-out wheeled bin" symbol means that you are legally obliged to recycle the marked equipment at the end of its life. The appliances must not be disposed of with (unsorted) household waste or packaging waste. Dispose of the appliances at special collection and return points, e.g. at recycling centres or at dealers who offer a corresponding take-back service.

Further Information and Tips:**http://www.tams-online.de**

Warranty and Service: tams elektronik GmbH
Fuhrberger Str. 4 30625 Hannover / GERMANY
Phone: +49 (0)511 / 55 60 60 Fax: +49 (0)511 / 55 61 61
Email: **support@tams-online.de**
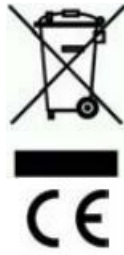
Documents / Resources

tams elektronik 70-01045 Interface Adapter [pdf] User Guide
70-01045 Interface Adapter, 70-01045, Interface Adapter, Adapter

References

- **Tams Elektronik - Elektronik + mehr für die Modellbahn**
- **Tams Elektronik - Elektronik + mehr für die Modellbahn**
- **User Manual**