Manual

mControl

Adapter for the integration of
additional devices for
Märklin** 6020 and 6021
into the EasyControl digital system

Item number 40-01607

tams elektronik

Contents

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.

The asterisks**

The asterisks** refer to products of Gebr. Märklin & Cie. GmbH. Contact details:

Stuttgarter Str. 55-57 | 73033 Göppingen | Germany

Internet: www.maerklin.de

1. Getting started

Contents of the package

After unpacking, check the delivery for completeness:

- mControl
- connection cable (red) with RJ-45 connectors (at least Cat. 5e)
- short-circuit plug (jumper)

Required accessories

As power supply for the mControl and the connected Märklin** additional devices (keyboards, controls) you need a DC or AC plug-in power supply (e.g. item no. 70-09110-01). Technical data:

- Connection: Hollow plug (2.1 mm)
- Output voltage: 12-16 V
- Current: at least 1 A

Intended use

The mControl is intended for use in digital model railway layouts according to the specifications in the instructions. 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 mc² is not intended to be used by children under the age of 14.

Safety instructions

Improper use and non-observance of the instructions can lead to incalculable hazards. Prevent these dangers by carrying out the following measures:

- Use the mControl unit only in closed, clean and dry rooms. Avoid humidity and splash water in the environment. After condensation has formed, wait two hours for acclimatisation before use.
- Disconnect the mControl unit from the power supply before carrying out wiring work.
- Only plug the mains plug of the power supply unit into properly installed and fused earthed sockets.
- Heating of the device and the power supply unit during operation is normal and harmless.
- Do not expose the devices to high ambient temperatures or direct sunlight. Observe the information on the maximum operating temperature in the technical data.
- Regularly check the operational safety of the devices, e.g. for damage to the connection cables or damage to the housing.
- If you notice damage or if malfunctions occur, switch off the supply voltage immediately. Send in the mControl for inspection.
- Dangerous voltages occur inside the power supply unit. Therefore, never open the housing of the power supply unit.

2. Your mControl

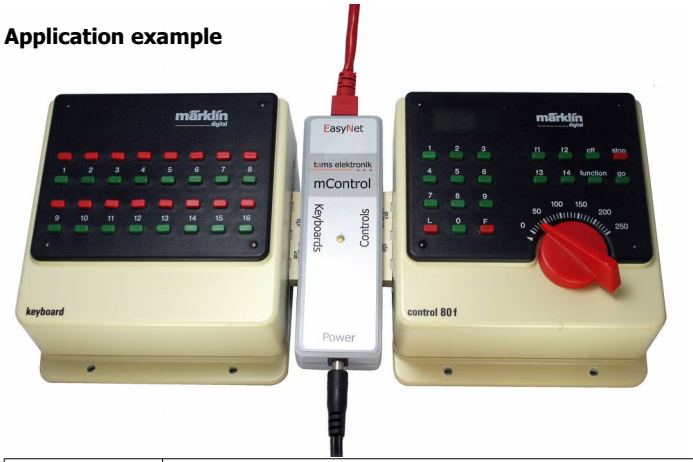
The mControl integrates older digital Märklin** control units, which were offered as supplements for the Märklin** Control Units 6020 and 6021, into the EasyControl digital system. In connection with an EasyControl digital central uunit (MasterControl, RedBox or mc²), the mControl replaces the Märklin** Control Unit.

Note: The MasterControl and RedBox Basic digital central units do not have an integrated booster. In layouts where the booster integrated in the Märklin**Control Unit was used to supply the layout, an external booster is therefore also required.

The mControl

- receives the control and switching commands sent by the Märklin** control units (keyboards, controls),
- translates them into control and switching commands for the EasyNet data bus used by the EasyControl digital system and
- forwards them to the EasyControl central unit (MasterControl, RedBox or mc²). This sends the commands to the vehicle and accessory decoders on the model railway layout.

Application example



Connection 1 "Controls"	for Märklin**-devices to control vehicle decoders ▪ Control 80 or Control 80F driving consoles ▪ other additional devices (e.g. Infra Control 80F) offered to complement the two versions of theControl Unit
Connection 2 "Keyboards"	for Märklin** units to control accessory decoders ▪ Keyboard 6040 ▪ Memory 6043

Transmission of commands for vehicle decoders

Unlike in connection with the Märklin**-Control Unit, the number of locomotive addresses is not generally limited to 80. With the Control 80F driver's desk and the additional device Infra Control 80F, 99 locomotive addresses can be controlled each. Due to the design, only 80 locomotive addresses can be transmitted with the Control 80 driving desk, even when connected to the mControl.

The commands that are entered at the Märklin** devices are not sent directly but from the EasyControl central unit to the vehicle decoders. Therefore, compared to the use together with the Märklin**-Control Unit, some functionalities change :

- You can control vehicles with Motorola as well as with DCC decoders (address range: 1 to 80 or 1 to 99).
- You can also control vehicle decoders that are set to 27, 28 or 128 speed steps. The speed steps are converted internally by the mControl.
- You can switch the functions F0 (function) to F4 as usual. Other functions (from F5), which were switched from other (non-Märklin**) control units, retain their position (on or off) when the control of a decoder is taken over by a Märklin** control unit.

Transmission of commands for accessory decoders

The number of turnout addresses is limited by the input possibilities of the respective Märklin** devices. Since the commands that are entered at the Märklin** devices are not sent directly but by the EasyControl central unit to the accessory decoders, decoders that react to Motorola commands as well as decoders that react to DCC commands can be controlled.

Programming decoders

It is not possible to access and change the data in the locomotive database of the EasyControl control unit from the Märklin** devices. The mControl does not transmit programming commands, therefore e.g. the main track programming (POM) is not possible from the Märklin** devices.

Connection of a PC

A PC that is to be integrated into the EasyControl digital control must be connected directly to the EasyControl central unit, as PC interfaces (e.g. 6050 or 6051) are not supported by the mControl.

3. Connection of the mControl

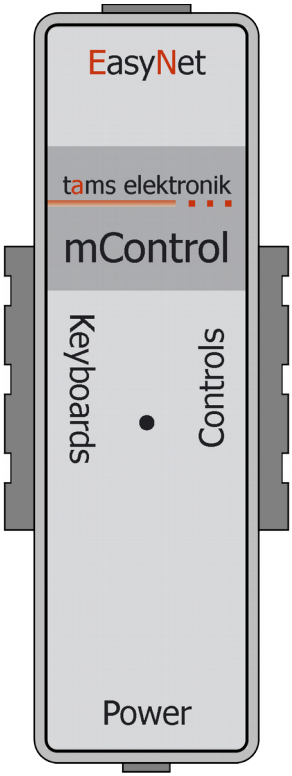
EasyNet connection of the central unit (MasterControl, RedBox, mc²)

Use the enclosed patch cable or a commercially available 1:1 patch cable of any length (RJ45). If the EasyNet connection of the control panel is already occupied by another device, see the following section.

Märklin** devices for controlling accessory decoders:

Keyboard 6040 and / or Memory 6043

Make the connections in the same way as the corresponding connections to the Märklin** Control Unit.



Märklin** devices for controlling vehicle decoders:

Control 80 or Control 80F driving consoles and / or other additional devices, offered to complement the two versions of the Control Unit (e.g. Infra Control 80F). Make the connections in the same way as the corresponding connections to the Märklin** Control Unit.

Power supply (Power):
Plug-in power supply unit (not included in the scope of delivery)
Voltage: 12 to 16 volts direct or alternating voltage
Current: min. 1 A

Separate power supply unit for the mControl!

A separate power supply unit is required to supply the mControl and the connected Märklin** control units. Do not connect the mControl and the Märklin** control units to a transformer or a power supply unit that supplies other units! The connected devices can be **irreparably damaged** in this case!

Only use 1:1 patch cables!

Never use crossover cables for connections to the EasyNet! This may cause irreparable damage to the central unit!

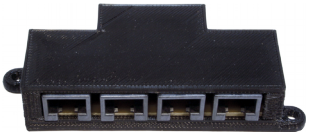
Connecting several external control units or adapters to the EasyNet

You can connect a total of up to 64 external control units or adapters to one EasyNet. To enable the use of several digital control units on one interface, you can use distributors:

Y distributor RJ45 (item no. 73-80190-01)
Input: 1 x RJ45
Output: 2 x RJ45

for the connection of
max. two external control units
or adapters

EasyNet distributor (item no.73-80195-01)



Input: 1 x RJ45 | Output: 4 x RJ45

for the connection of
max. four external control units
or adapters

4. Operation with the mControl

The prerequisite for using the mControl in the EasyControl digital control is software version V2.0.0 or higher for all connected devices (MasterControl, RedBox, mc² and other external EasyControl control devices or adapters). If this is not the case, the mControl does not work or does not work correctly. If necessary, carry out a software update for your the components of the EasyControl digital system.

Sending switching and control commands

Enter the switching and control commands for the (vehicle and accessory) decoders according to the operating instructions of the Märklin** devices. You can also control DCC decoders, as the commands are not sent directly from the Märklin** devices but from the EasyControl central unit to the decoders. It is also possible to control vehicle decoders that are set to 27, 28 or 128 speed levels.

Display of the operating states

The LED on the mControl indicates various operating states:

red	The EasyControl digital system is set to STOP.
green	The EasyControl digital system is in standard operation (GO).
red flashing in standard operation	The connected EasyControl central unit (MasterControl, RedBox or mc²) has received a short-circuit message.
red flashing after switching on	The mControl is in update mode and awaits a software update (see section 5.1).
orange (mixture of red and green) after switching on	The mControl is not connected to the EasyNet.

5. Software Update

The mControl is a mature product according to the current state of the art. The control software is adapted to new developments. It can be updated to the current status by means of a software update.

Please note: All EasyControl devices used in a digital control system must have the same software version! Otherwise, the data transmission between the devices may be disturbed.

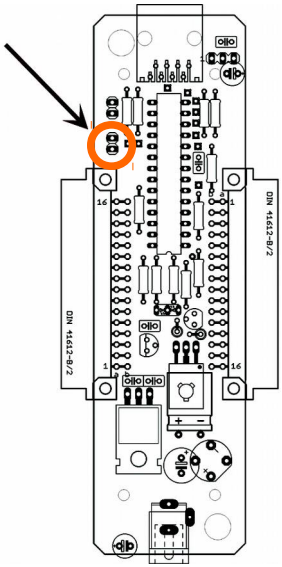
You can download the latest software (firmware) free of charge from our homepage (www.tams-online.de/download/firmware).

If you do not want to or cannot carry out the update yourself, you can send us your EasyControl devices. The update is free of charge, we only charge the shipping costs for the return according to our valid price list.

5.1. Starting the software update

First download the firmware (i.e. the software that controls the mControl) from the homepage to your PC. You can find the firmware at:

www.tams-online.de/download/firmware



1. Disconnect the connections

- between mControl and power supply (plug-in power supply)
- between EasyNet and all external control devices (including the mControl for which you want to perform an update)

2. Preparations

- Unscrew the housing cover.
- Bridge the pins of the pin strip (see drawing). Preferably use the jumper enclosed with the delivery for this purpose.

3. Re-establish the connections

- between mControl and power supply (plug-in power supply)
- between your EasyNet central unit and the mControl

The LED on the mControl flashes red, indicating that the mControl is in update mode.

5.2. Update with the MasterControl

Change to the menu item "Software update" on the MasterControl and confirm the selection with # / ok. → The display of the MasterControl shows "...Download..." in the bottom line.

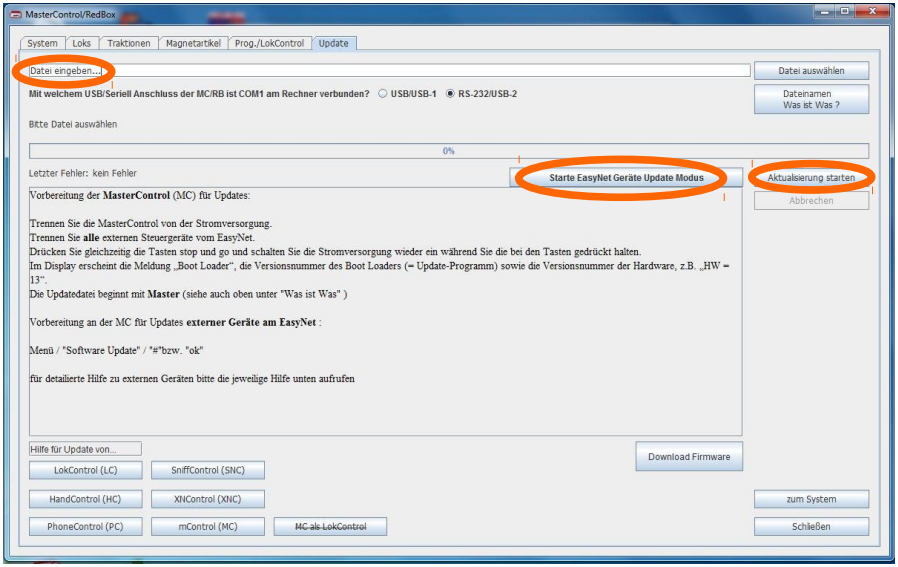
Now establish the connection to your PC and then start the update programme on the PC. Please note: Always establish the connection to the PC before starting the programme. Otherwise, the software may not correctly recognise the interface via which you have connected your PC to the MasterControl.

Continue according to the instructions of the programme.

5.3. Update with the RedBox

To update with the RedBox, you need the software "CV-Navi", which you can download free of charge from our homepage.

Please note: Always connect to the PC before starting the CV-Navi programme. Otherwise the software may not correctly recognise the interface through which you have connected your PC to the RedBox.



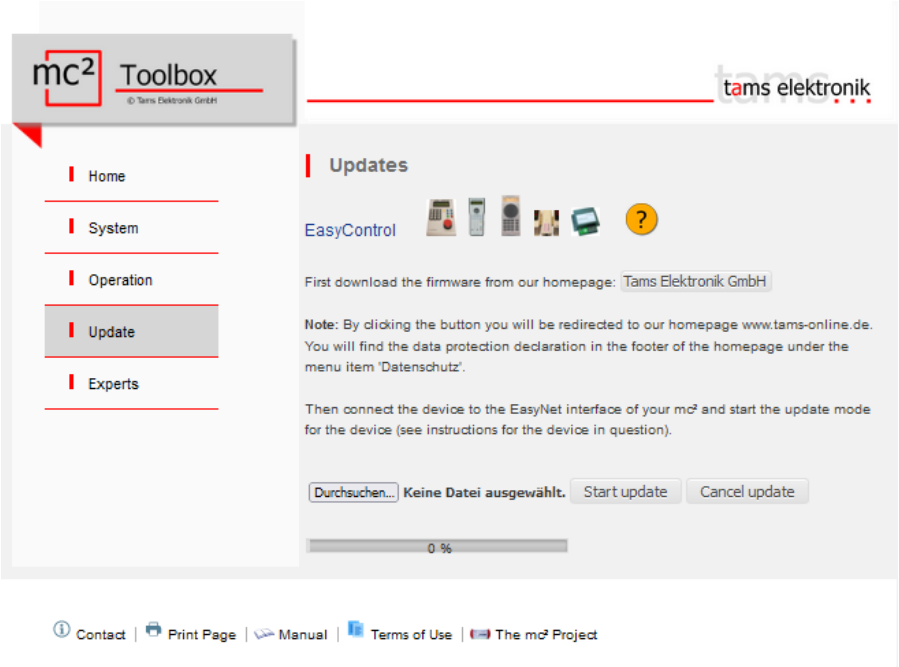
In the "CV-Navi" programme, select the "Update" tab and activate the update mode by selecting the "Starte EasyNet Geräte Update Modus" button. Then select the file with the current firmware that you have saved on your PC ("Datei eingeben") and start the update ("Aktualisierung straten".

Note: To end the update mode for the RedBox, you must briefly switch it off.

5.4. Performing an Update with the MasterControl 2 (mc²)

Under the menu item "Updates" of the mc² toolbox, you can carry out updates for further digital devices for the EasyControl digital system, e.g. for your mControl. The prerequisite is that the device is connected to your mc² via the EasyNet interface.

Section of the "Update" interface of the mc² toolbox:



Click the "Browse" button and select the file with the current firmware that you have saved on your PC. Start the update.

5.5. Finishing the Update

Disconnect the connections to the EasyNet and the power supply.

Remove the jumper from the pins of the pin header and screw the housing cover back on.

Re-establish all connections that are necessary for operation.

6. Checklist for troubleshooting

- When switching on, the LED flashes red.

  Possible cause: The mControl is in update mode. → Remove the jumper from the pin strip (or another type of bridging). See also section 5.1.
- When switching on, the LED lights up both orange (mixture of red and green).

  Possible cause: The mControl is not connected to the EasyNet. → Check the connection to the EasyNet.
- In standard operation, the LED flashes red.

  Possible cause: The EasyControl central unit has received a short-circuit message. → Eliminate the short-circuit.

Technical Hotline

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

Repairs

You can send us a defective circuit for repair (address on the last page). In the event of a warranty or guarantee claim, the repair is free of charge for you. As proof of any warranty or guarantee claim, please enclose the proof of purchase with your return.

If there is no warranty or guarantee claim, we are entitled to charge you the costs of the repair and the costs of the return shipment. We charge a maximum of 50% of the new price for the repair according to our valid price list. We reserve the right to refuse the repair if it is technically impossible or uneconomical.

Please do not send us repair shipments freight collect. In the event of a warranty or guarantee claim, we will reimburse you for the regular shipping costs.

7. Technical data

Interfaces

For the connection to the EasyControl digital system	EasyNet (RJ45)
For the connection to Märklin** control units	Märklin I²C-Bus

Electrical properties

Supply vo rol and the connected Märklin** control units	DC or AC plug-in power supply with hollow plug (2.1 mm) Voltage: 12-16 V Current: min. 1 A
Current consumption (without consumer)	approx. 100 mA

Schutz

Predection	IP 20 Meaning: Predected against solid foreign bodies with a diameter ≥ 12.5 mm and access with a finger. No predection against water.

Environment

	For use in closed rooms
Ambient temperature during operation	0 ~ + 60 °C
Permissible relative humidity during operation	10 ~ 85% (non-condensing)
Ambient temperature during storage	- 10 ~ + 80 °C
Permissible relative humidity during storage	10 ~ 85% (non-condensing)

Other features

Dimensions (approx.)	130 x 40 x 25 mm
Weight (approx.)	70 g

8. Warranty, EC Conformity & WEEE

8.1. Warranty Statement

We voluntarily grant a 2-year warranty for this product from the date of purchase by the original customer, but for a maximum of 3 years after the end of series production of the product. The first customer is the consumer who first purchased the product from us, a dealer or another natural or legal person who resells or installs the product in the course of his or her independent professional activity. The warranty exists in addition to the statutory warranty claims to which the consumer is entitled against the seller.

The scope of the guarantee includes the free repair of defects which can be proven to be due to material processed by us which is not in perfect condition or to manufacturing defects. In the case of kits, we guarantee the completeness and perfect condition of the components, as well as a function of the components in accordance with the characteristic values in uninstalled condition. We guarantee compliance with the technical data if the kit is assembled in accordance with the instructions and the finished circuit is installed and commissioned and operated in the prescribed manner.

We reserve the right to repair, rectify, replace or refund the purchase price. Further claims are excluded. Claims for compensation for consequential damage or from product liability exist only in accordance with the statutory provisions.

A prerequisite for the effectiveness of this guarantee is compliance with the operating instructions. Furthermore, the warranty claim expires in the following cases:

- in the event of unauthorised modification of the circuit,
- in the event of attempted repairs to the finished component or finished unit,
- in the event of damage caused by the intervention of third parties,
- incorrect operation or damage due to negligent handling or misuse.

8.2. EC Declaration of Conformity

CE 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:

Only connect the power supply unit to a professionally installed and fused socket.

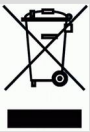
Do not make any changes to the original components and follow the instructions in this manual exactly.

Only use original spare parts for repair work.

8.3. Declarations on the WEEE Directive

This product is subject to the requirements of the EU Directive 2012/19/EC on Waste Electrical and Electronic Equipment (WEEE), i.e. the manufacturer, distributor or seller of the product 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 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 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.

Weitere Informationen und Tipps:
More information and tips:
Plus d'informations et de conseils :
Meer informatie en tips:

http://www.tams-online.de

Garantie und Service:
Warranty and service:
Garantie et service :
Garantie en service:

Tams Elektronik GmbH

Fuhrberger Straße 4
DE-30625 Hannover

fon: +49 (0)511 / 55 60 60
fax: +49 (0)511 / 55 61 61

e-mail: modellbahn@tams-online.de