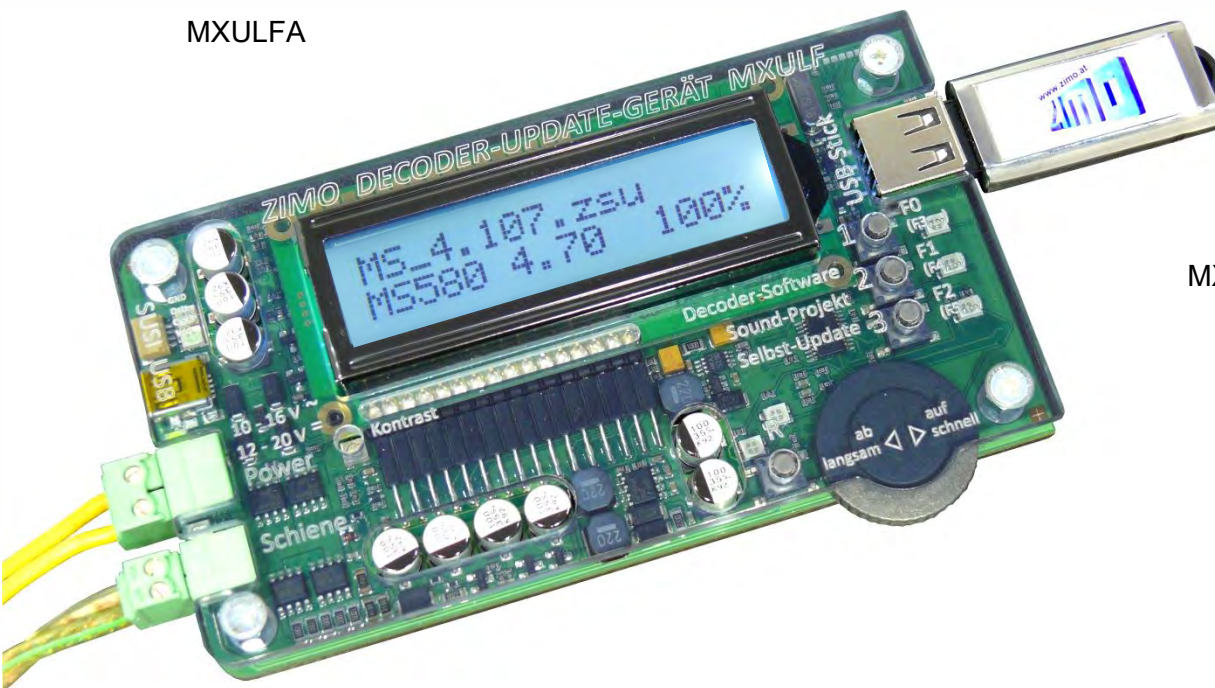
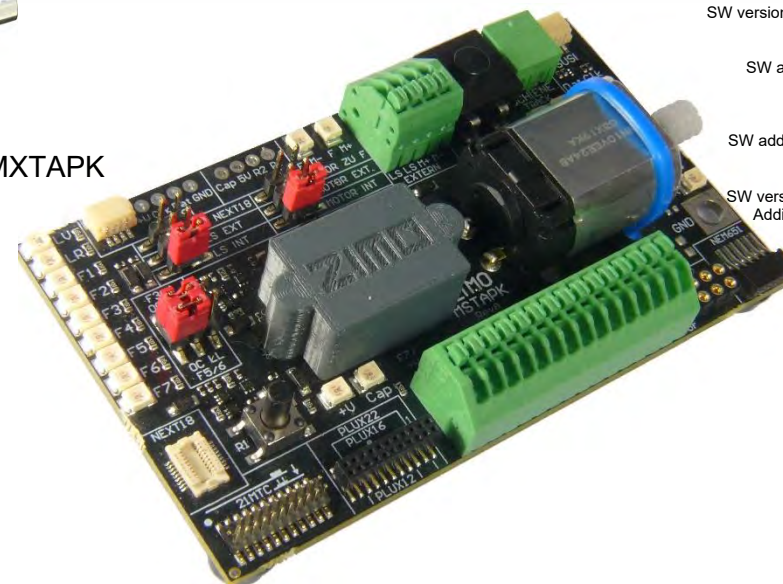


INSTRUCTION MANUAL

MXULFA



MXTAPK



EDITIONS:

First delivery in December 2011 -	2011 12 20
until April 2012	
SW add-on 2 — SW version 0.22 —	2012 11 10
SW add-on 3 — SW version 0.32 —	2012 12 20
SW add-on 4 — SW version 0.40 —	2013 03 12
SW add-on 5 — SW version 0.50 —	2013 08 20
0.56.03 —	2013 11 20
	2014 03 13
Dortmund 2014 edition	2014 04 06
SW version 0.61 —	2014 05 20
	2014 10 10
	2015 01 22
SW add-on 6 -	2015 07 05
	2015 08 24
	2015 11 25
	2016 03 11
SW add-on 0.70 -	2016 08 01
	2016 08 18
	2016 09 01
SW version 0.85 -	2020 01 20
Addition MS -	2020 02 20
	2020 06 01
	2020 07 30
	2022 06 30

Decoder Update and Sound loading device **MXULFA**

and:

Test- and Connection Board **MXTAPS, MXTAPV**

As well as **MSTAPK, MSTAPG**

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1. MXULFA Features

The MXULFA has the following tasks and capabilities:

- Software update of all ZIMO decoders of the generations MX... and MS..., either from USB stick or from computer (programs ZSP, ZCS), in case of MS... only without PC.
- Loading of sound projects into all ZIMO decoders of the generations MX... and MS..., either from USB stick or from computer (programs ZSP, ZCS), optionally via rail (decoder built into locomotive) or via SUSI interface (1/10 time requirement).
- Special measures such as "Power Cycle Update" for cases where MS decoders have been "software destroyed" by malfunctions during the normal update process or by other means.
- Simultaneous sound loading of several decoders via SUSI interfaces connected in parallel (via several MXTAP or MSTAP boards, or special multi-update boards for applications in series production).
- CV programming and CV reading, optionally in OP MODE (Operational Mode, POM) or SERV MODE (by type of programming track), with simplified display for decoder ID reading and load code writing.
- Testing decoders or vehicles, mostly after software update or loading of a sound project: Driving operation and switching of functions via control elements and display of the MXULFA, also test operation in the context of repair work; however, the MXULFA is NOT a replacement for a digital command station.
- Interaction with the test and connection boards MXTAP.. to MSTAP.. where decoders with standard interfaces (PluX, MTC, Next, NEM651, NEM652) are plugged in or wired decoders are connected to terminals and tested (by means of motor, loudspeaker, function LEDs, etc. installed there).
- Self-update of the MXULFA via USB stick.
- **Synchronous update** (loading software parallelly) for accessory decoders MX820, MX821
- Operation of MXULF via the USB device interface (alternative to flash drive). Software updates, sound loading, configuration of and testing decoders from the computer via programs like ZCS, PfuSch and TrainProgrammer enable comprehensive and comfortable possibilities to improve ZIMO decoders, also, and especially, for larger fleets.

NOTE: Due to ongoing development of the MXULF software, there are sometimes slight differences between the operating instructions and the actual behavior of the MXULF; in particular, display representations sometimes anticipate planned software versions.

2. Technical Data

Supply voltage at input "Power" .. **12 - 20 V DC** (power supply unit or rail current from digital command station) or 10 - 16 V AC (in case of problems: use DC!)

for software update and loading sound of large-scale decoders **min. 16 V DC!**

Maximum supply on output "Schiene" (track) (stabilized to 12 V) 2 A

Dimensions (L x W x H) 125 x 65 x 12 mm

3. The USB stick for use with MXULFA

A USB stick compatible with the MXULFA is used as a data carrier when updating the decoder and loading sound projects; alternatively, however, these tasks can also be performed without a USB stick, directly from the computer (via USB cable).

The self-update of the MXULFA is only possible with the help of a USB stick on the MXULFA.

A "ZIMO USB stick" is included with each MXULFA; however, other sticks can also be used.

If a USB stick does not (or no longer) work with MXULFA (this will be more often the case with third-party sticks), the USB stick must be reformatted to "FAT32" on the computer (see Windows ...).

On the USB stick (root directory) are stored (in connection with MXULFA):

- If a self-update of the MXULFA is to be made:
 - from the ZIMO website (www.zimo.at) under *Update & Sound / Decoder Update Device MXULF*, from a (usually the latest) .zip file of the type (example) *MXULF_ver_0_83_55.zip* the unzipped files **MXULF.ulf** and **MXULF.bin** (these files have the same name in all versions).
- If a decoder software update (for one decoder or for several decoders) is to be executed:
 - from the ZIMO website (www.zimo.at) under *Update & Sound / Update - MS decoder* or *Update - MX decoder*, from a .zip file (usually the latest one containing the decoder group in question) of the type **MS_4_202.zip** the unzipped file (single file in the .zip) of the type **MS_4_202.zsu**: the so-called **decoder software collection file**.
The term "collection file" means that new software versions are included for a variety of decoder types; in the above example for all MS sound decoders (but not for MX decoders); there may also be collection files for MX and MS decoders on the website, as well as collection files for subsets (e.g. MX non-sound decoders). During the update process, MXULFA and decoder ensure that the correct update file is applied.
- When a sound project is to be loaded:
 - from the ZIMO website (www.zimo.at) under *Update & Sound / ZIMO Sound Database* the desired ready-to-use sound project of the type (example) **OeBB_16-KkStB310_ZIMO_8Bit_S01.zpp**

NOTE: in case of a (chargeable) "coded" sound project, a "load code" must be programmed into the decoder in question before the actual sound loading process. See Info under *ZIMO Sound Database*.

The above-mentioned files can be mixed and stored in any number on the USB stick (root), i.e. several .zsu files together with several .zpp files. However, a selection must then be made directly on the MXULFA before the actual update or loading process; see the following descriptions

4. Switching on the MXULFA and connecting a decoder

- **"Power"**: Connect power supply unit or transformer according to technical data, preferably the one supplied, to the MXULF. → LED „Power“ green.



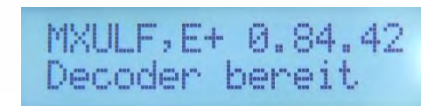
The display shows "MXULF", the hardware revision (e.g. "E" or "E+"; + stands for the optimized RailCom-detector hardware, no matter if originally installed or by subsequent upgrade, which is offered in 2021/22);

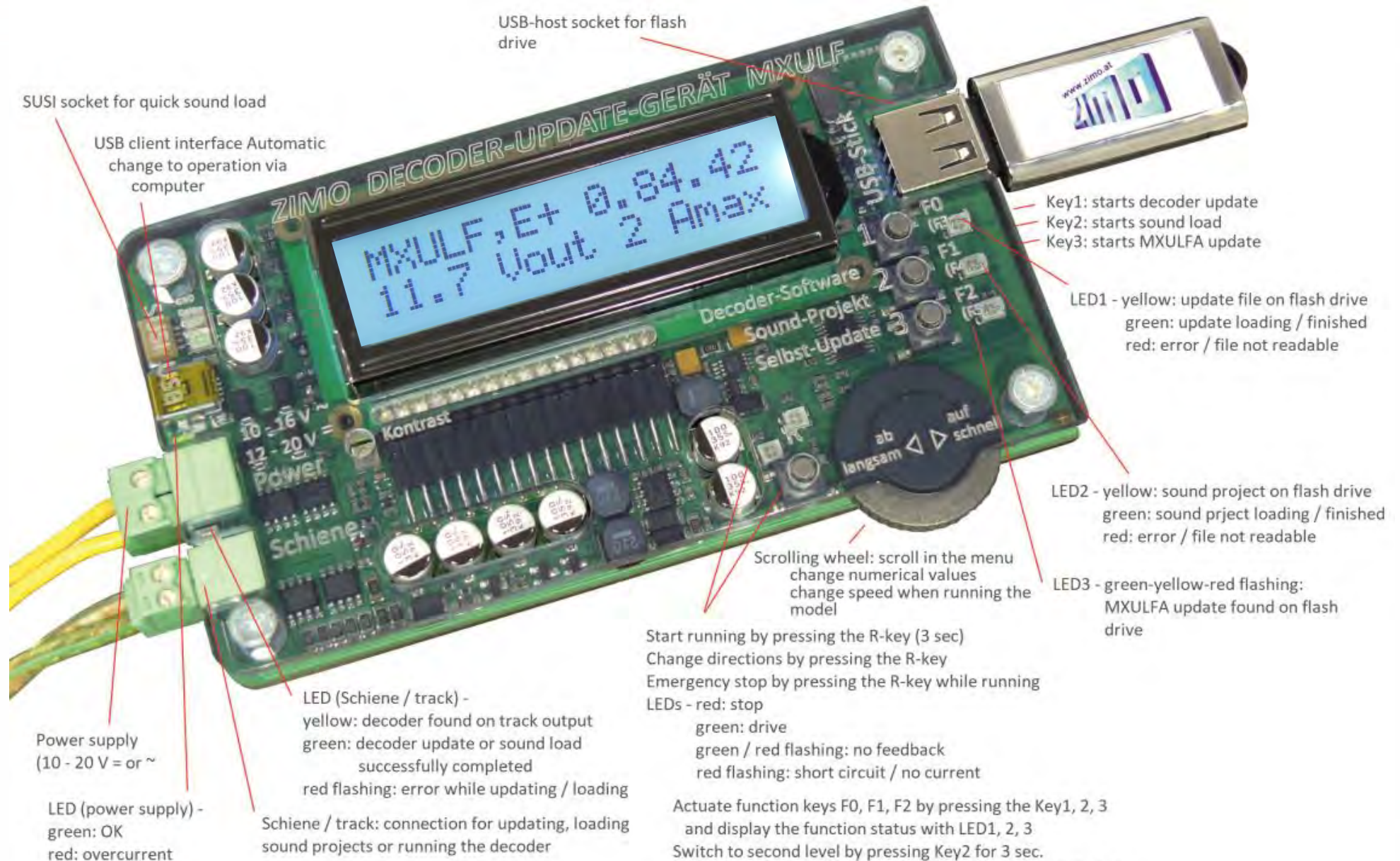
Software version, voltage on rail, max. current.

Connect **rail** to MXULFA, decoder to rail,

OR: Connect connection board MSTAP, MXTAP, etc. , plug in/connect decoder there.

→ LED „rail“ yellow..





USB-host socket for flash drive

SUSI socket for quick sound load

USB client interface Automatic change to operation via computer

Key1: starts decoder update
Key2: starts sound load
Key3: starts MXULFA update

LED1 - yellow: update file on flash drive
green: update loading / finished
red: error / file not readable

LED2 - yellow: sound project on flash drive
green: sound project loading / finished
red: error / file not readable

LED3 - green-yellow-red flashing: MXULFA update found on flash drive

Scrolling wheel: scroll in the menu change numerical values change speed when running the model

Start running by pressing the R-key (3 sec)
Change directions by pressing the R-key
Emergency stop by pressing the R-key while running

LEDs - red: stop
green: drive
green / red flashing: no feedback
red flashing: short circuit / no current

Actuate function keys F0, F1, F2 by pressing the Key1, 2, 3 and display the function status with LED1, 2, 3
Switch to second level by pressing Key2 for 3 sec.
Actuate function keys F3, F4, F5 by pressing the Key1, 2, 3
Switch to third level by pressing Key3 for 3 sec.
Actuate function keys F6, F7, F8 by pressing the Key1, 2, 3

Power supply (10 - 20 V = or ~)

LED (power supply) - green: OK red: overcurrent

LED (Schiene / track) - yellow: decoder found on track output green: decoder update or sound load successfully completed red flashing: error while updating / loading

Schiene / track: connection for updating, loading sound projects or running the decoder



5. Self-update of the MXULF or MXULFA

NOTE: Especially in times of market introduction of new decoder types or generations, frequent updating of the MXULFA's own software is practical or even necessary. It is impossible in practice to keep a correct documentation of which decoder in which version is compatible with which software of the MXULFA; therefore, it must be recommended to update the MXULFA itself at the latest in case of problems.

- Download new **MXULF software** from www.zimo.at - Update & Sound - Decoder update device MXULF as .zip file; **unzip** the .zip file, save the two resulting actual update files **MXULF.ulf** and **MXULF.bin** in the **root directory** of the **USB stick**. For this you can use the ZIMO USB stick enclosed with the device (which is already correctly formatted), or any other USB stick; see chapter "USB stick for use with MXULFA".

In the main directory (root) of the USB stick other files may be stored at the same time (especially update or sound files for decoders); for reasons of clarity and reliability files of any kind and in large numbers should not be present on the stick.

Tip for first time users: only the necessary files on the USB stick (root), in this case MXULF.ulf and MXULF-bin.

- Prepare MXULFA: **Disconnect all connections, reconnect ""Power"** (included power supply unit or rail output of a digital control center) → **LED "Power" green**.
- Insert **USB stick** prepared above → **LED 3 flashes red-green-yellow** (if correct files, i.e. .ulf and .bin, are found on the USB stick).
- Key 3** (long, 3 sec) → **Self-update starts**

NOTE: Key 1 and key 2 lead into the areas of the decoder software update or the sound loading, if suitable files (.zsu or .zpp) are stored on the stick.

- Wait for message **"Booting ... CRC OK"**. CRC OK may appear instead!
- Key 3** → **to acknowledge**,

MXULF resets and shows startup screen if automatic reset does not work: Disconnect "Power" terminal briefly.

```
MXULF,E+ 0.84.42
11.7 Vout 2 Amax
```

```
Booting
CRC OK
```

```
MXULF,E+ 0.84.98
11.7 Vout 2 Amax
```



For the self-update, only the power supply (at terminal "Power" of the MXULFA) must be connected, and a USB stick with the correct files for the update must be inserted.

Typical arrangement for software update and/or sound loading via "rail": Decoder installed in locomotive, locomotive on "update track", power supply from power supply unit via terminal "Power", USB stick with the correct files for update and/or sound loading inserted.



6. Decoder software and sound from USB stick

The **"standard procedures"** include: **Decoder software update** and **sound project load** single (or several in a row) ZIMO decoder of the generations MX... and MS..., either on rail (mostly decoder built into loco) or connected to MXTAP..., MSTAP, optionally via rail protocol (in loco or ...TAP...) or (sound only) SUSI interface (1/10 time requirement).

Decoder software update via the rail with decoder software collection file on the **USB stick**. Decoder installed in locomotive or connected to a test and connection board MXTAP..., MSTAP ...

- Prepare USB stick: download a suitable (containing the relevant decoder type; possibly for MS and MX separately) decoder SW collection file from www.zimo.at - Update & Sound - Update MS decoder or Update MX decoder, unpack it and save it in the root directory of the **USB stick (.zsu file)**.
Tip for first time users: only this one file on the USB stick (root), delete all others (especially older .zsu versions)

- Prepare MXULFA: Connect "Power" (power supply or power source according to the technical data) to the MXULF;
→ Start screen on display → **LED "Power" green**.
Sequence of the following two steps as desired:
- Connect **rail** to MXULFA, **vehicle** (with decoder) on rail (only vehicle, only decoder)
OR: Connect MSTAP.. or MXTAP.. board (with decoder plugged in or connected decoder) to MXULFA (rail)
→ Second line: "Decoder ready" or decoder type (display dependent on MXULF-SW version; sequence not dependent).

```
MXULF,E+ 0.84.42
11.7 Vout 2 Amax
```

```
MXULF,E+ 0.84.42
Decoder bereit
```

```
MS_4.107.zsu
Decoder bereit
```

- Insert prepared (described above) USB stick, **Three variants of the further process depending on the stick content:**

- if **single** decoder **SW** collection file (.zsu file):
→ First line: Name of this file → **LED „1" yellow**
Key 1 → **Start decoder software update**
- if **single sound project** on the stick (.zpp file):
→ First line: Name of this file → **LED „2" yellow**
Key 2 → Starting decoder sound loading
see next chapter
- if there are **several** files on the stick (.zsu and/or .zpp)
→ First line: → **LED „1 and/or LED „2" yellow**
Note on keys - selection of the further operation
Key 1 → to the list of decoder **SW** collection files (.zsu)
Key 2 → to the list of **sound** projects (.zpp files)
Scroll (scroll wheel) in respective list; cursor on selected file, depending on whether .zsu or .zpp:
Key 1 → **Starting the decoder software update**
Key 2 → Starting the decoder sound loading
see next chapter

```
T1->SW T2->SOUND
Decoder bereit
```

```
MS_4_97.zsu
DS201217.zsu
```

The decoder update starts ...

```
Speicher wird
freigegeben ...
```

Decoder software update in progress, with logging of the most important steps (clear memory), progress display in %. When 100% is reached: **Remove the vehicle from the track**, and - if desired - connect/set up **another decoder**,
Key 1 → **Start decoder update with identical .zsu file**

```
MS_4.107.zsu
MS580 4.70 58%
```

```
MS_4.107.zsu
MS580 4.70 100%
```



MX decoder only: During update or sound loading the update lock is automatically deactivated. (CV #144 = 0) and analog operation is disabled (CV #29, bit 2 = 0). After finishing the process MXULFA tries to set the CVs back to the original values (this may fail!).

Decoder sound loading over the rail with sound project on USB stick
 Decoder installed in locomotive or connected to a test and connection board MXTAP, MSTAP...

- Prepare USB-Stick: Download the **sound project** from [www.zimo.at / Update & Sound / ZIMO Sound Database](http://www.zimo.at/Update&Sound/ZIMO_Sound_Database) and save it in the root directory of the USB stick (.zpp file), or multiple .zpp.

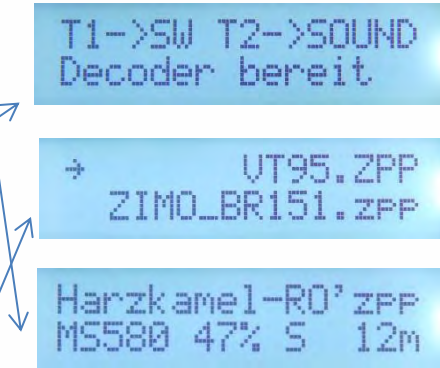
Note: in the case of a (chargeable) "coded" sound project, a "load code" must be programmed into the decoder in question before the actual sound loading process. See info under [ZIMO Sound Database](#).

- Prepare MXULFA: Connect "Power" (power supply or power source according to the technical data) to the MXULF;
 → Start screen on the display → LED „Power“ green.
 Sequence of the following two steps as desired:
- Connect rail to MXULFA, vehicle (with decoder) on rail (only vehicle, only decoder)
 OR: Connect MSTAP.. or MXTAP.. board (with decoder plugged in or connected decoder) to MXULFA (rail)
 → second line "Decoder ready" or decoder type (display depends on MXULF-SW version; sequence not dependent).



- Insert **USB stick** (as prepared above) into USB socket
Three variants of the further process depending on the stick content:

1. If single decoder SW collection file, i.e. .zsu file:
 → First line: Name of this file → LED „1“ yellow
 Key 1 → Start Decoder-Software-Update
 see previous chapter
2. If a single sound project on the stick, so .zpp file:
 → First Line: Name of this file → LED „2“ yellow
 Key 2 → Start decoder sound loading
3. If multiple files on the stick (.zsu and/or .zpp)
 → First line: → LED „1 and/or LED „2“ yellow
 Note on keys - selection of further operation
 Key 1 → to the list of decoder SW collection files (.zsu)
 Key 2 → to the list of sound projects (.zpp files)
 Scroll (scroll wheel) in respective list; cursor on selected file, depending on whether .zsu or .zpp:
 Key 1 → Start decoder software update, resp.
 Key 2 → Start decoder sound loading



Typical arrangement for software update and/or sound loading via "rail"; decoder is located in the matching slot of a test and connection board (...TAP..., in the picture below MSTAPK); only connection between MXULF - "rail".
 ▼ and ...TAP... - "rail" necessary.

- **Loading of the sound project** is running, with logging of the most important steps (clear memory, etc.), progress display in %, for sound loading also time prognosis in min.
 When 100% is reached: remove the vehicle from the rail, and - if de
 Key 2 → Start identical sound project (.zpp) file.



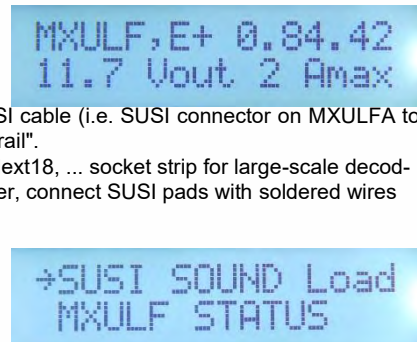
Decoder sound loading via SUSI interface with sound project on USB stick SUSI plug or solder pads directly to decoder or decoder plugged to test-and-connect board

SUSI loading is the **fast** alternative (approx. factor 10 compared to rail) for decoders which are **NOT installed**. Normally the slots (PluX, MTC, Next18, ...) on a test and connection board MXTAP or MSTAP are used for contacting; but with wired decoders (also with NEM-651 or -652) wires have to be soldered to the SUSI pads.

- Prepare USB stick (same as for sound loading via rail):
 download the desired sound project from www.zimo.at - Update & Sound - ZIMO Sound Database and save it in the root directory of the USB stick (.zpp file), or several .zpp. files.

NOTE: in case of a (chargeable) "coded" sound project, a "load code" must be programmed into the decoder in question before the actual sound loading process. See info under [ZIMO Sound Database](#).

- Prepare MXULFA (same as for sound loading via rail), if not already switched on:
 Connect "Power" (power supply unit, ...) to MXULF
 → LED „Power“ green.
- Connect **connection board** (MXTAP.. or MSTAP..) by SUSI cable (i.e. SUSI connector on MXULFA to SUSI connector on MSTAP.. or MXTAP.. board), but NOT "rail".
- **Connect the decoder** to a suitable interface (PluX, MTC, Next18, ... socket strip for large-scale decoders) on MSTAP... or MXTAP..., or, in case of a wired decoder, connect SUSI pads with soldered wires to SUSI pins on MSTAP... or MXTAP....
- **Insert USB stick** (as prepared above) into USB socket
- **R key** (long, approx. 3 sec) → opens the menu.
 Scroll (scroll wheel) to "**SUSI SOUND Load**" →



Two variants depending on stick content:

if single sound project on the stick (.zpp file):

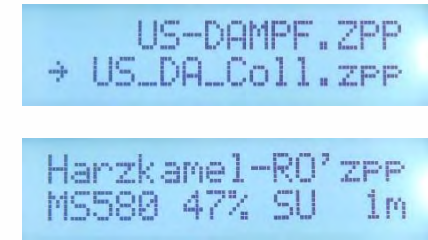
- R-Key** → Start decoder sound loading

2. When multiple sound projects on the stick:

List of sound projects
 Scroll (scroll wheel) in list of sound projects, cursor on selected project.

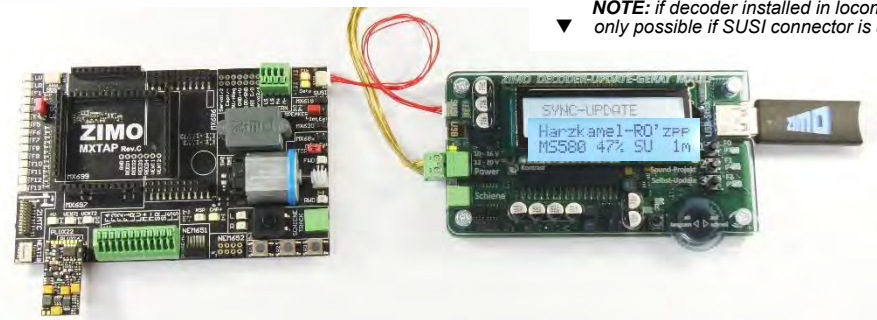
- R-Key** → Start decoder sound loading

- **Loading of the sound project** runs, with logging of the most important steps (clearing memory, etc.), progress display in %, time estimate for completion in min.
- When 100% is reached: Remove vehicle from rail, and
 R-Key → Start identical sound project



Typical arrangement for sound loading via "SUSI": Decoder is located in the appropriate slot of a ..TAP., - board (in the picture MXTAP); only SUSI cable ("rail" must not be connected).

NOTE: if decoder installed in locomotive, only possible if SUSI connector is accessible.





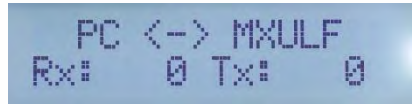
7. Decoder software and sound from computer

The same things that are loaded from the USB stick into the decoder (see previous chapter) can also come directly from the computer (via the **programs ZSP and ZSC** in different ways and to different extents depending on the expansion state of the programs). In contrast to the use of the USB stick, the **decoder software update** and the **sound project loading** from the computer are not operated on the MXULFA itself (but on the computer), which therefore only shows the number of received and sent data on the display.

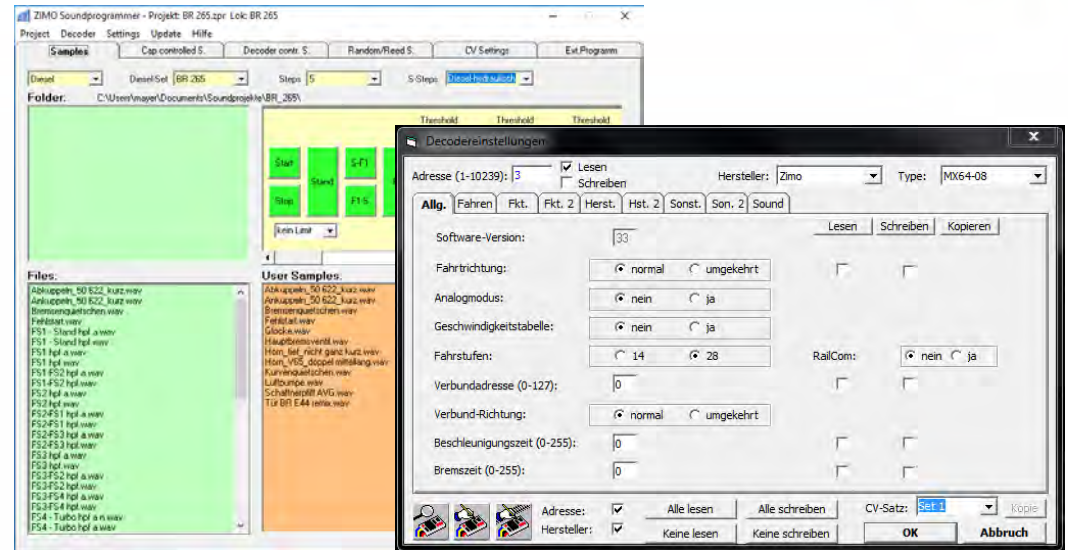
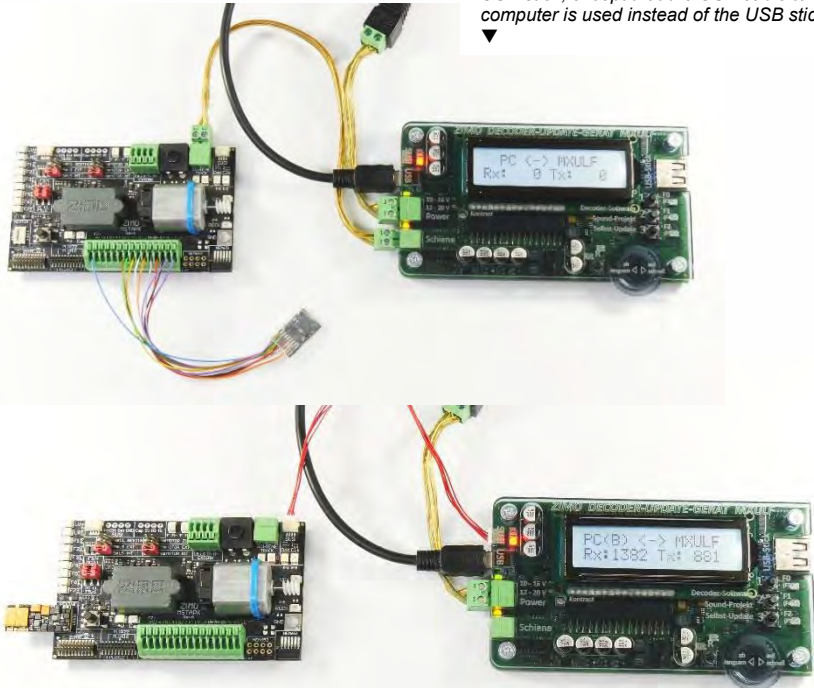
So this is also about the "standard procedures" for single ZIMO decoders of the generations MX... and MS..., either on rail (decoder built into loco) or connected to MXTAP..., MSTAP..., optionally via rail protocol (in loco) or MXTAP ... or SUSI interface (1/10 time requirement).

ATTENTION: the self-update of the MXULFA is NOT possible from the computer (only via USB stick).

- Prepare MXULFA (same as for USB stick operation), if not already switched on:
Connect "Power" (power supply unit, ...) to MXULF.
→ LED „Power“ green.
- Execution of the software (ZSP, ZCS, or possibly also other programs); display of the MXULFA logs the data traffic.



The same arrangements as when using the USB stick, except that the USB cable to the computer is used instead of the USB stick.



▲ **ZSP ZSP** (creation of sound projects, decoder update, sound loading):
in the above picture the recordings during software update of a sound decoder MX645; MXULF is recognized as MX31ZL (because MXULF behaves the same way).

ZCS („ZIMO CV Setting“, by Matthias Manhart, <http://www.beathis.ch/zcs/index.html>):
Comfortable tool for decoder configuration with a number of setting windows, especially for modifying sound projects and also for adjusting in real time, i.e. the parameters are modified directly during driving and take effect immediately.

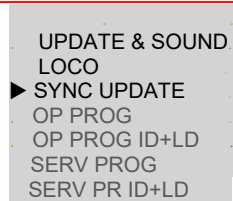


8. Synchronous update for accessory decoders MX820, MX821

This method removes a problem especially known with large-scale layouts: decoders built-in to turnout casings (e.g. LGB) have to be removed and connected individually to a decoder-update-device to load an update.

Using the *synchronous update*, the decoders can stay on the layout, the decoder-update-device MXULFA is connected instead of the digital command station and sends the new software to all accessory decoders. Every single accessory decoder then has the possibility to request a repetition by negative acknowledgements, until all decoders have the update installed. Vehicles can usually stay on the tracks during this procedure.

ATTENTION: the MXULFA, or the power supply connected, is limited in its efficiency. The current draw of connected consumers (including vehicles which are placed on the layout) as well as the inrush-current at power-up can lead to a shut-down due to a short circuit.



← **Menu after pressing and holding the R-key**
 (display only shows 2 lines,
 other lines can be reached by scrolling).
 reach menu item SYNC UPDATE by scrolling,
 start by shortly pressing the **R-key**

First, all accessory decoders on the layout (suitable for the synchronous update) are located and its number is displayed, sorted by decoder family.

NOTE: the searching process can take up to 2 seconds per decoder.

This list of decoder families stays on the display during the whole updating procedure; every line shows the current procedures for the corresponding family.

First decoder family is searched for, found number is displayed → MX820 SEARCH 3

Search complete; marked to show that search is complete → ■ MX820 FOUND 7

The next decoder family (MX821) is searched automatically → ■ MX820 FOUND 7
MX821 SEARCH 2

Search finished → ■ MX820 FOUND 7
■ MX821 FOUND 5

I.e. all lines with a completed search are marked.

Starting updates: Briefly press R-key → Starts update for all families
 or after 10 sec timeout → (also) starts update for all families
 or scroll to a line and briefly press R-key
 → Starts software update for the selected decoder family
 (all other marks are deleted)

Progress is shown → ■ MX820 SY-UP 68%
■ MX821 FOUND 5
 (Mark flashes during the update, % rises)

Update complete (number, in brackets number FOUND) is displayed → MX820 OK 6(7)
■ MX821 FOUND 7
 (Mark is deleted only in the corresponding line)

press and hold **R-key**: Exits the synchronous update, returns to menu.

9. Driving operation with MXULFA

The MXULFA is also a small command station with max. 2A This allows test drives to be completed after sound loading or CV programming. You can only drive with the MXULFA (version with display).

Operation

Display on Display (EXAMPLES)

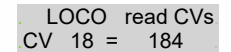
... after powering on the MXULFA → MXULF,E SW 0.22
11.6 Vout
 Display of track voltage (limited to about 12 V)

Menu after pressing and holding the R-key (3 sec)

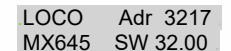
Menu item LOCO either pre-selected or reached by scrolling to LOCO,
 selection by pressing the **R-key**



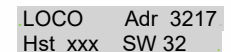
After selection by R-key, driving operation is prepared →
 Address and important CVs (#1, #29, #17, #18, #7, #8, ...) are read
 Sound and lighting is activated automatically after reading CV values.



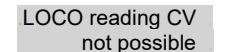
Address, type (e.g. MX645), SW version are displayed →



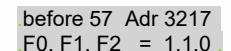
or (non-ZIMO) name of Manufacturer ID or: value of CV #8 →
 (at third-party manufacturers only CV #7 is shown as SW version)



or (if it cannot be read-out)

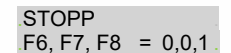


Move speed regulator (**scrolling wheel**) or direction key →

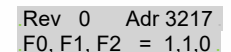


Permanently displayed: Direction of travel (For, Rev), speed step,
 current function-trio F0, F1, F2; those functions are activated with buttons 1, 2, 3
 (press and HOLD button 2 or 3: Switch to F3, F4, F5 or F6, F7, F8)

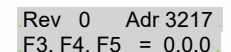
direction key while driving (=fast stop) →



direction key at standstill (=change of direction) →



Press and HOLD button 1, 2 or 3: switch function-trio →
 to each F0, F1, F2 or: F3, F4, F5 or: F6, F7, F8 e.g.: key 2



press and hold **R-key**: Exits the driving operation, returns to menu.



10. Programming/ reading CVs *SERV PROG / OP PROG*

The MXULFA not only is a module too update ZIMO decoders, but also to read-out and program CVs. The MXULFA provides two ways of communication with the decoder:

- **PRO**gramming on the **SER**Vice track: the decoder connected to "Schiene" responds with motor pulses to requests by the MXULFA. This method is slow, but in many cases effective.
- **OP**erational **PRO**gramming: more than one decoder can be connected to "Schiene", but only the decoder selected by its address will respond to the MXULFA's request. This method is also called PoM (Programming on the Main).

To activate one of the programming modes, press and hold the **R-key** (3 sec) to open the menu, scroll to "SERV PROG" or "OP PROG" and press the **R-key** to change to the programming method.

SERV PROG

SERV PROG CV After selection by **R-key**: Wait to enter CV number

SERV PROG CV 122 = enter CV number with scrolling wheel, **R-key**

SERV PROG CV 122 =136 ACK enter CV value with scrolling wheel, **R-key**, ack. by motor current-Feedback by sending „ACK“

SERV PROG CV 122 =136 NACK enter CV value with scrolling wheel, but programming failed, therefore „NACK“

SERV PROG CV 122 = 0 READ or again **R-key** to read out, value is displayed with "READ"

SERV PROG CV 122 = N-RD or again **R-key** to read out, but doesn't work feedback „N-RD“ (= „No Read“).

CV 122 =136 ACK CV program or read further CVs "old" line moves up

CV 122 =136 ACK CV 123 =

Press and hold **R-key**: return to menu.

OP PROG

OP PROG Address = 0 After selection by **R-key**: Wait to enter address (with scrolling wheel). It is possible to have more than one decoder on the (programming) track / output

"Schiene", only the one addressed is talked to.

OP PROG CV 122 = 136 ACK Further procedures like in SERV PROG, but faster, with the same feedback (ACK, NACK, READ, N-RD), and additionally „SENT“ (i.e. CV programming complete but not acknowledged).

11. Read / program load code

The load code for sound projects is one of ZIMOs specialties, which originates in a number of sound providers. They produce sound projects for ZIMO sound decoders. To load these sound projects onto a decoder, you have to buy a "load code". This not only depends on the sound project's author, but also on the identification number of the decoder.

It is a simple process:

- Read out the decoder ID: CV values #250, 251, 252 and 253.
- Buy a load code (ZIMO homepage, retailer, sound project's author): 4 three-digit numbers.
- Program these values into CVs #260, 261, 262 and 263.
- Load the sound project into the decoder (see chapter 6).

To read and program the necessary values, the MXULFA provides the possibilities already known from chapter 9 "read and program CVs": "PR SERV ID+LD" or "PROG OP ID+LD".

Entering one of the programming modes via the menu: press and hold the **R-key** (3 sec) and select "SERV PR ID+LD" or "OP PR ID+LD" with the scrolling wheel.

SERV PR ID+LD

SERV PROG ID = 221, 56,242,102 After selection by **R-key** decoder ID is read out and displayed (CVs 250-253)

SERV PROG ID = NO-READ or: After selection by R-key, decoder ID is read out, doesn't work

SERV PROG LC = Press and hold **R-key** again to enter load code (CVs 250-253)

SERV PROG LC = 196, 67, 23, program values, continue/ exit with **R-key** (CVs 260-263)

196, 67, 23,244 LC READ or: instead of entering, press **R-key** again to read out the load code

196, 67, 23,244 LC ACK after last value, press **R-key** ACK = ACKnowledgement, load code is valid and accepted by the decoder

196, 67, 23,244 LC NACK or: after last value, press **R-key**, doesn't work NACK = Not ACKnowledged; usually: Load code is not valid or does not correspond to the serial number

Press and hold **R-key**: return to menu.

OP PR ID+LD

OP PROG Enter addr: After selection by **R-key** the address is entered, by pressing the R-key the ID is read out automatically.

Otherwise, this procedure is identical (but faster) to the mode "SERV PR ID+LD" (see previous chapter).



12. Decoder-connection board **MXTAPS** / V

MXTAPS and **MXTAPV** are the "old" test and connection boards (from the "MX time"), see next chapter for the more modern (functionally similar) **MSTAPK** and **MSTAPV**.

ZIMO decoder-test-and-connection boards are best used with **MXULFA**, as well as ZIMO command stations (especially **MX10**), but also with older ZIMO digital command stations and devices of other manufacturers.

The basic features of these PCBs are the following:

- Plugs for all interfaces used in ZIMO decoders, i.e. PluX12, -16, -22, Next-18, 21MTC, NEM651, NEM652 (all standardized by VHDM or NMRA), as well as interfaces for large-scale decoders MX696, MX697, MX699 (proprietary of ZIMO).
- Two versions - **MXTAPS** only for small scales, **MXTAPV** with all interfaces (including large-scale)
- Connection to **MXULFA**, ZIMO central command station or other digital command stations via double clamp "SCHIENE" and, if necessary (if available on counter device) via SUSI cable.
- To test the decoders, the following is provided: DC motor, speaker (1 Watt), various LEDs for function outputs and fan outputs (large-scale decoders), servo connections (large-scale decoders), plugs for various ZIMO decoder types and wires to external consumers.

NOTE: With the **MXTAPS** or **MXTAPV**, also decoders of other manufacturers can be used. To update software or sound, naturally, a suitable programming device of the corresponding manufacturer has to be used. When testing, ZIMO and other products can be mixed on both sides. SUSI sound load is only possible with ZIMO decoders.

Connections between the **MXTAPV** and the **MXULF**: a 2-pole cable to connect the "Schiene"-plug (track; connectors are supplied with the device) and a 4-pole SUSI cable (supplies; **SUSIKAB**).

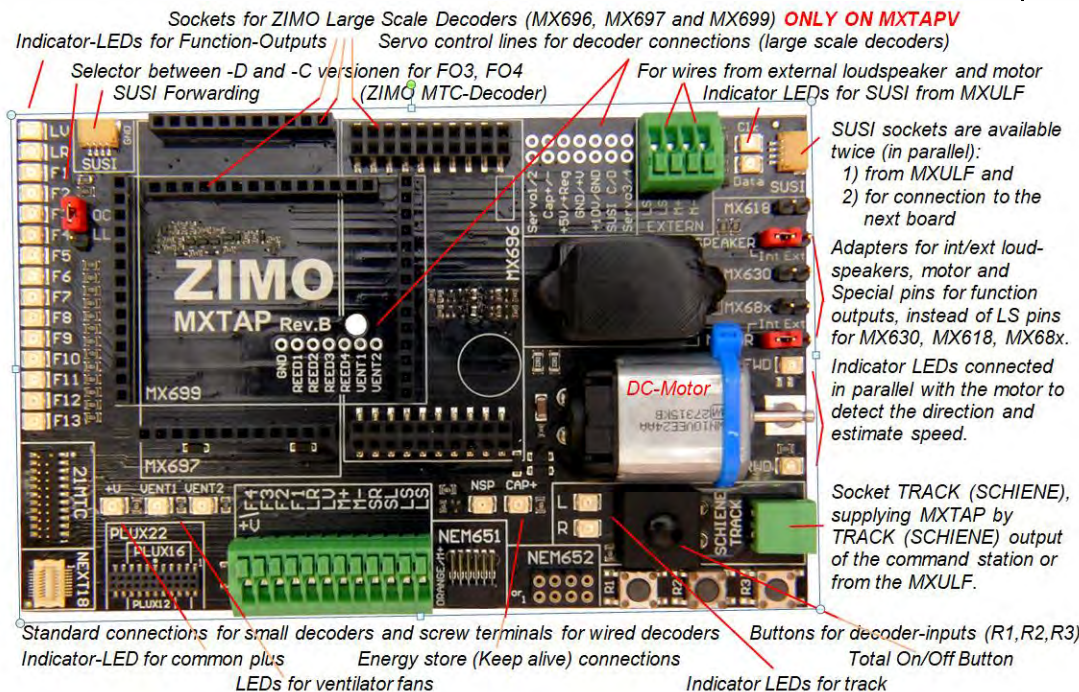


The **MXTAPS** (or **MXTAPV**) is connected to the output "Schiene" of the **MXULF** via the double clamp "SCHIENE", and to a track output of a ZIMO central command station or another digital command station. No additional supply is necessary.

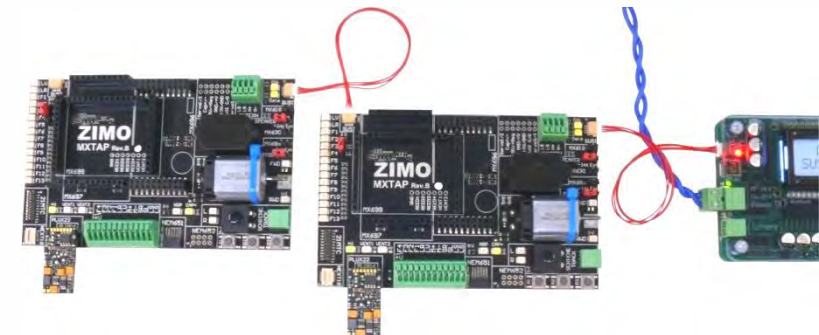
If needed, the SUSI plugs from **MXULF** and **MXTAP** are connected: via "SUSI", sound loading is essentially faster than via "tracks". For decoders with the interfaces "PluX", "MTC", "Next" as well as large-scale decoders, SUSI is automatically available at the "SUSI" interface of the **MXTAP** and can easily be transferred to the **MXULF**.

ATTENTION: only ONE connection can be used. Therefore, you can NOT connect more than one decoder to the number of interfaces of the **MXTAPS** or **MXTAPV**.
MX644 can NOT be loaded simultaneously!

NOTE: The supply via SUSI cable is sufficient for SUSI sound loading!
DO NOT connect "rail" at the same time!



Simultaneous sound loading of more than one MX645P22 via "SUSI": each decoder has to be connected to an individual decoder-test-and-connection board **MXTAP**. Several **connection boards** can be connected in **parallel**.





Typical application:

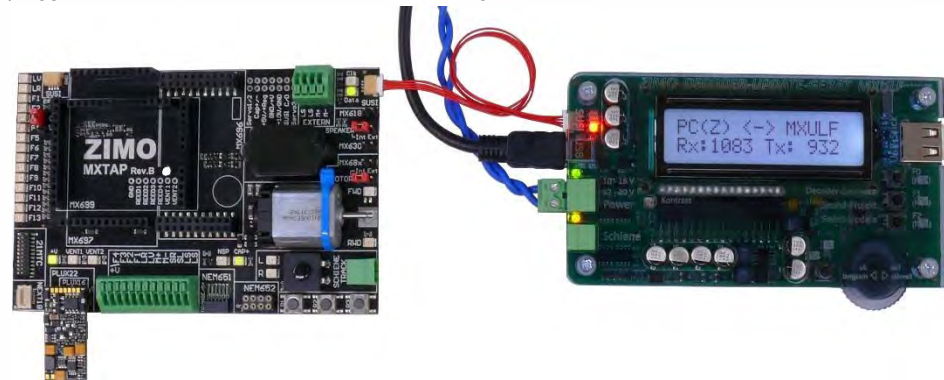
MXTAPV with decoder MX644D (MTC interface), connected to MXULFA:
Supply of the combination via connection "Power" on the MXULFA, 2-pole cable from "Schiene" (MXULFA) to "SCHIENE" (MXTAP); on the MXULFA, a **decoder update** was just started (according to the display), the decoder software is loaded **from a flash drive**.



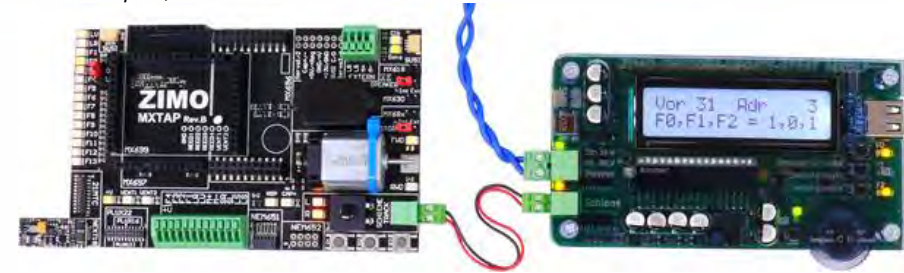
MXTAPV (not MXTAPS) with connected large-scale decoder MX696, connected to MXULFA: on the MXULFA **sound loading** was just started (according to the display), the sound project is loaded **from a flash drive**.



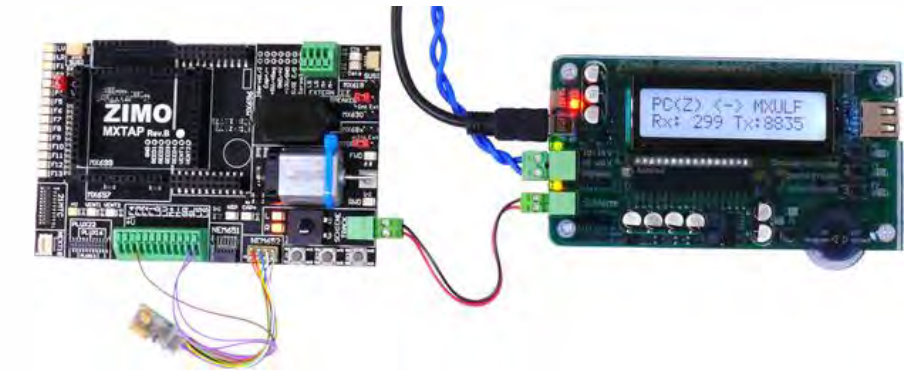
MXTAPV with decoder MX645P22 (PluX22), connected to MXULFA: additionally, **SUSI** cable between MXULFA and MXTAPV, for **faster sound loading via SUSI**, MXULFA in this case is controlled **by computer** (usually software ZSP - ZIMO Sound Programmer; USB cable to the computer; on the display information to communication between PC and MXULF). **ATTENTION:** The rail connection to the test stand must be disconnected. Never leave SUSI + rail plugged in at the same time, this can cause damage to the decoder!



MXTAPV with decoder MX648N18 (Next), connected to MXULFA:
Via operating elements and display of the MXULFA, **test operation** is active, i.e. tests motor control, function outputs, sound of the decoder.



MXTAPV with decoder MX648R (8-pole NEM652 interface, speaker not on interface, therefore, wires on clamps), connected to MXULFA:
In this case, the **test operation** is controlled by the computer (display controller in ZSP or ZCS), therefore, on the display only information about communication between PC and MXULF.



ATTENTION: To load sound into large-scale sound decoders, the SUSI interface ("SUSI" plug) on the decoder itself has to be used; it is NOT provided on the pin connectors of the decoder and therefore also NOT on the SUSI pins of the MXTAPV!

Therefore, it is not possible to load more than one large-scale decoder at the same time like "small" decoders (see previous page - with more than one MXTAPVs). Instead, it is possible to build your own equipment to connect large-scale decoders in parallel by SUSI cables.



13. the decoder connection boards MSTAPK resp. -G

MSTAPK and MSTAPG are the "newer" test and connection boards (from the MS era); see previous chapter for the (functionally similar) "old" MXTAPS and MXTAPV.

The ZIMO decoder test and connection boards of the MS series were developed in connection with the MS sound decoders, in order to support their possibilities fully (therefore e.g. two loudspeakers for large rail-road decoders and PluX-26 decoders, interfaces for the new gauge 0 decoders. etc.).

MSTAP.. and MXTAP.. are nevertheless similar in many respects. MSTAP.. (i.e. the "more modern") test and connection boards are practically universal, applicable for MS as well as for almost all MX decoders (exception: not for MX696); in case of using MXTAP for MS decoders there are restrictions for large scale decoders (only 1 speaker, missing cut points for gauge 0 decoders).

However, because of the greater number of interfaces, in the case of MSTAP. there is no combined test and connection board for all decoders (as there is with MXTAPV), but two types:

MSTAPK: Test and connection board for "small" decoders (interfaces for H0, H0e, TT, N, ...)

MSTAPG: Test and connection board for large scale decoders (gauges 0, 1, 2, G, ...) and PluX-26.

9 Control LEDs for Fu outputs

Jumper for reconfiguring FA3, FA4 as amplified or logic level outputs (ZIMO decoder with 21MTC interface)

SUSI Forwarding to the next TAP

SUSI on solder pads

Jumper Speaker Pins: internal / external LS / Fu-Outputs (Non Sound) (Next18-Interface)

ELKO Plus, 5V, IN2, IN1 from decoder led out on solder pads

Control LEDs Function decoder "Motor pins"

Connections external speaker and external motor

Jumper Motor connection: internal / external Motor / Fu-Outputs (Fu-Decoder)

ON/OFF - Main switch

Connection RAIL (supply...)

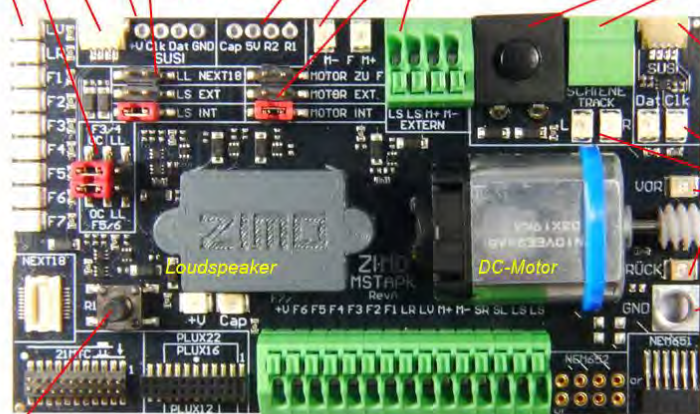
"SUSI" sockets available twice (internally connected in parallel):
1) from the MXULF, and
2) for forwarding to the next board (see top left next to LEDs).

Control LEDs SUSI

Control LEDs Rail

Control LEDs Motor (Connected in parallel to this one, to indicate the direction and estimate the speed).

GROUND (for croco clip)



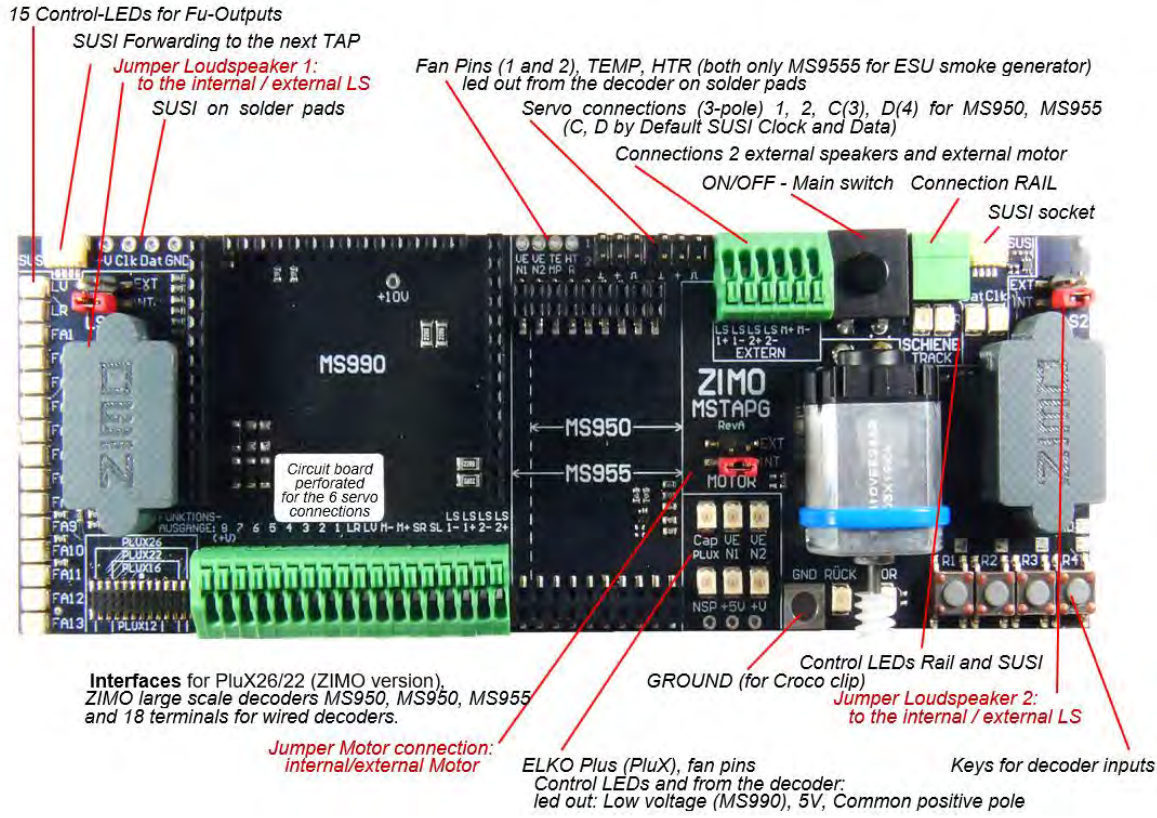
Button for Decoder-input IN1

Standard interfaces for "small" decoders (Next18, 21MTC, PluX22/16, NEM-652, NEM-651) and 15 terminals for wired decoders.

Typical applications MSTAPK together with MXULFA:

Power supply of the combination via connection "Power" at the MXULFA, 2-pole connection from "Rail" (MXULFA) to "RAIL" (MSTAPK); a decoder update has just been started at the MXULFA (according to the display), the decoder software comes from the USB stick.





Typical applications MSTAPG together with MXULFA:

MSTAPG with attached large scale railroad sound decoder MS990 (ZIMO interface for sizes G, 1), connected to MXULFA: **sound loading** has just been started at MXULFA (according to the display), the sound project comes from the USB stick.

IMAGE WILL BE ADDED LATER



Annex: Declaration of Conformity and Warranty

Declaration of Conformity:

ZIMO Elektronik GmbH hereby declares that the product MX10 bears the EC mark and is built in accordance with the provisions of Directives 88 / 378 / EWG ; 89 / 336 / EWG ; 73 / 23 / EWG.

24 months warranty:

Our products are technically sophisticated and are manufactured and tested with utmost care, therefore, ZIMO Elektronik GmbH guarantees its products for 24 months from the date of purchase (with proof of purchase from a ZIMO contractor).

The warranty covers the repair or replacement of defective parts. ZIMO Elektronik GmbH reserves the right to proceed at its own discretion only if the damage is proven to be the result of a design, manufacturing, material or transport fault. A repair does not extend the warranty. Warranty claims can be made with a ZIMO contract partner or ZIMO Elektronik GmbH. Proof of purchase is required.

The warranty does not apply:

- with normal wear and tear
- if devices are not used for the purpose intended by ZIMO Elektronik GmbH and in accordance with its operating instructions
- in case of modifications or alterations not performed by ZIMO Elektronik GmbH.

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