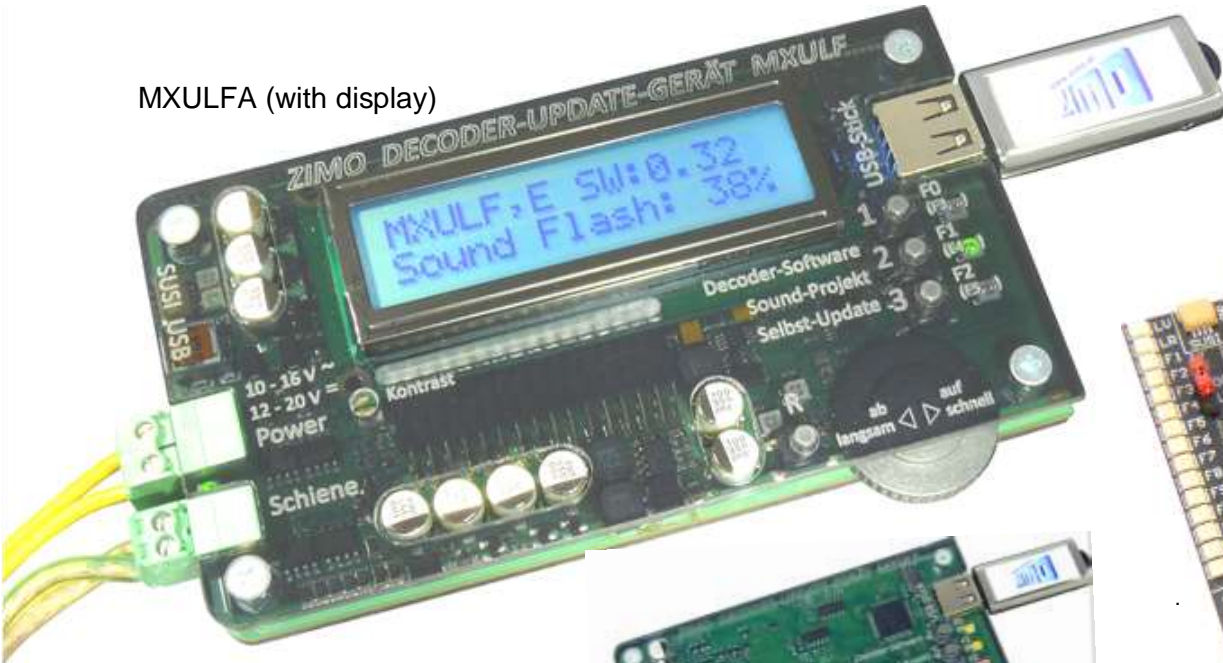


INSTRUCTION MANUAL

MXULFA (with display)



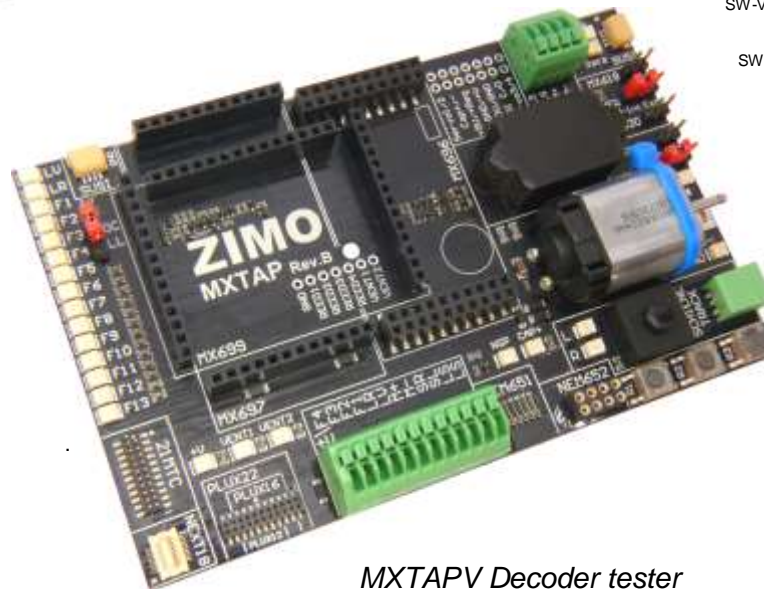
MXULF (w/o display)
no longer in production



Decoder-Update and Sound-Upload-Module
MXULF and MXULFA
 (Software Level 6)
Decoder tester MXTAPS and MXTAPV

EDITION

For the initial delivery in December - 2011 12 20	.
to April 2012	.
SW level 2 – SW-Version 0.22 - 2012 11 10	.
SW level 3 – SW-Version 0.32 - 2012 12 20	.
SW level 4 – SW-Version 0.40 - 2013 03 12	.
SW level 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 09 10
	2015 01 22
SW-Version 6 -	2015 07 05
	2015 08 24
	2015 11 25



MXTAPV Decoder tester

CONTENT

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1. Notes to software level 6

MXULF and MXULFA update modules delivered in late 2012/early 2013 contain software level 3, from March 2013 software level 4 and from September 2013 software level 5.

Software level 3 (early 2013)

- Software updates via USB stick for all ZIMO decoder and ZIMO sound decoder
- Sound project upload via USB stick for all ZIMO sound decoder
- Software updates of the MXULF itself, also via USB stick
- Automatic programming of the CV's that could prevent decoder updating (in particular to override the update lock in CV #144 and to disable the analog mode). These CV's will be reset to the previous values after a successful update procedure.
- Testing the engine (driving and functions) right on the update track with the control elements on the MXULF (scroll wheel, switches and LED's). This makes it easy to instantly test an uploaded software or sound project.
- High-speed sound project uploads with the help of the SUSI connector on the MXULF (about 30s for a typical 32Mbit project, which takes more than 10 minutes via "the track"), especially useful for sound uploads ahead of decoder installation.

Software level 4 (March 15th 2013):

- CV programming and read-outs in service, load-code entry.

Software level 5 (from SW level 0.56.03 included bug fix, since November 2013):

- Synchronized update (simultaneous software upload) for new accessory decoders MX820.
- Selection from several update or sound files on the USB stick is now possible.

Software level 6 (complete from SW version 0.61.20, December 2013):

- MXULF controlled by a computer via the USB client interface (as an alternative to the use of USB sticks). This opens comprehensive and convenient ways for software updates, sound uploads and configurations to optimize ZIMO decoders, also particularly useful for large vehicle fleets.

Software level 7 and more (planned for 2015):

- CV programming in Operations Mode, feedback via RailCom.
- Alternative programming mode for serial decoder programming (without unlocking update lock).
- The MXULF in this (final) stage can also be used as a DCC system under computer control (plus one vehicle under manual control with the MXULF); the most economical way of model railroading.
- It will be possible to select a decoder address with the control elements of the MXULFA during vehicle operation, which means that more than just one engine is allowed on the track output of the MXULF.
- Adding sound samples to existing ready-to-use sound projects; typically for adding station announcements, user-recorded whistles and other special custom sounds. However, this feature also requires a corresponding expansion of the decoder software.

2. Technical Data

Operating voltage at "Power" input 12 - 20 V DC (power supply or from command station)
 or 10 - 16 V AC (transformer. If problems: use DC!)
 for software updates and sound uploads of large-scale decoder.....min. 16 V DC!
 Maximum power output at "Schiene" (Track) output (12V stabilized)..... 2 A
 Dimensions L x B x H 125 x 65 x 12 mm.

3. MXULF/MXULFA User Interface

The MXULF and MXULFA both have the same LED's for status and progress indications; the MXULFA also has an additional 2 x 16 graphic display.

The MXULF with LED's only is quite sufficient for simple update and sound upload operations; on the other hand, an MXULFA with display is highly recommended for driving, function actuations and CV programming.

Summary of the basic functions and LED indicators:

Power LED - after connecting a power source to the "Power" plug

(not all indications are fully implemented with software levels 1 - 3)

LED (Power) green: Voltage OK, amps not excessive
 yellow: Voltage is too low
 yellow, flashing: Voltage too high
 red, briefly lighting up: short term overcurrent, but still operational
 red: overcurrent, switched off

Track output LED – after connecting decoder (to output "Schiene")

(not all indications are fully implemented with software levels 1 - 3)

LED ("Schiene") yellow: Decoder found and recognized (decoder type read-out)
 green, flashing (in unison with LED 1 or 2): Update or sound upload in progress
 green: Update or sound upload finished
 red, flashing (1:1) in unison with LED 1 or 2: Update or sound upload failed

USB content and upload progress indicators

LED 1 yellow: USB stick recognized and readable, decoder SW file present; after pressing button 1:
 green, flashing: Decoder software update in progress
 green, solid: Update finished
 red, flashing: Update failed

LED 2 yellow: USB stick recognized and readable, decoder sound file present; after pressing button 2:
 green, flashing: Sound upload in progress
 green, solid: Sound upload finished
 red, flashing: Sound upload failed

LED 3 green-yellow-red-flashing (1:1:1): USB stick contains MXULF update software; after pressing button 3:
 green: MXULF update finished >> Details to MXULF self-update, see next page!

R-Key, press and hold (> 1 sec.): Enters the Menu (only visible in the MXULFA version, with display)

The menu lists other available operating modes, besides the update and sound upload (i.e. DRIVING, SYNC UPDATE OP PROG, SERV PROG).

Scroll down to the line **DRIVE** in the menu and briefly press the R-button to enter the driving mode:

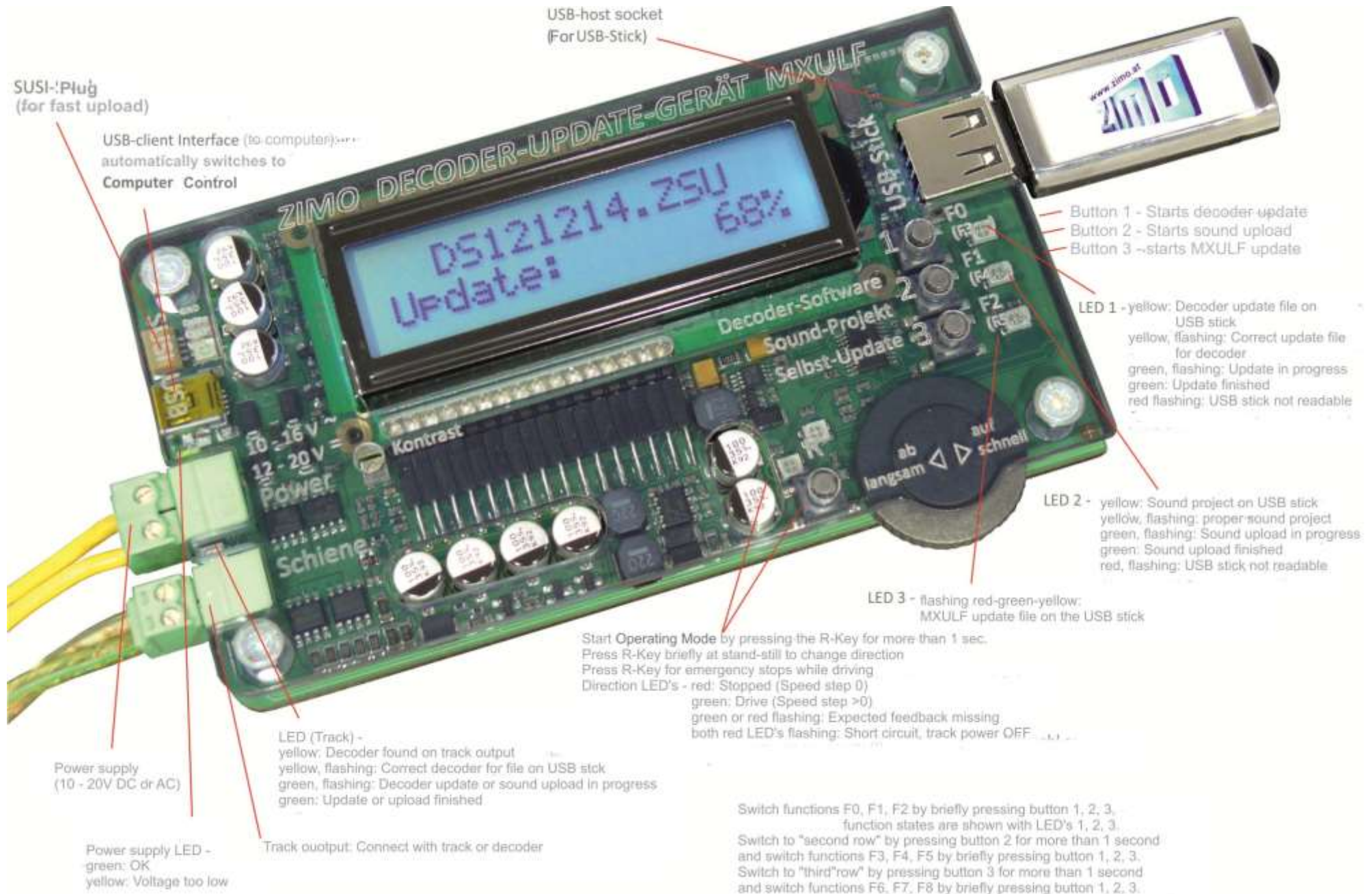
Direction LED's red: Driving direction at standstill - green: Direction while driving (speed step > 0)
 red, flashing (both LED's): STOP (after pressing the R-key while driving)

Briefly press the R button at standstill: Changes direction - while driving: STOP

Press and hold R button (> 1 sec.): Exit the driving mode!

LED's 1, 2, 3 function indicators F0, F1, F2 (or groups F3...F5, F6...F8 etc.)

Briefly pressing buttons 1, 2, 3: operates functions - Press and hold: switches between function groups.



4. MXULF or MXULFA self-update

New software for the MXULF(A) can be downloaded as a zip file from the ZIMO website at www.zimo.at (go to "Update & Sound" -> "Update – Decoder update module MXULF"). The zip file must be unzipped first (double click in Windows Explorer) if the browser doesn't unzip the file automatically. The unzipped file is the actual update file (i.e. the two files MXULF.ulf and MXULF.bin).

Copy the update file (.ulf and .bin) to the root memory of a USB stick. The USB stick supplied with the unit can be used but almost any other stick should work as well. Only one file with the same extension (.ulf or .bin) should be in the root area of the stick. Other files such as update or sound files don't interfere and may remain on the stick.

Proceed with the self-update as follows:

- Preparation: Remove all connections from the MXULF (Power, track, USB, SUSI, USB stick...)
 - Connect power, 12 – 20V DC (either power supply or track output of a DCC system)
 - Plug in the prepared USB stick. As soon as the .ulf and .bin files are found on the USB stick, the LED 3 flashes red-green-yellow
 - Start the self-update by pressing button 3 for >1 second.
- After a few seconds...
- LED 3 changes to green: Update is finished
 - Press button 3 to exit and reboot the MXULF (or reboot by turning power OFF/ON)

MXULFA Display

Booting
WAIT
CRC OK

General information to the MXULF instruction manual:

The term "MXULF" is often used as a collective term for both the MXULF and MXULFA.

Due to the ongoing development of the MXULF software there are sometimes slight differences between the manual and the actual behavior of the MXULF; particularly the display images may sometimes be ahead of the planned software version.

5. Decoder Software-Update, Sound-Upload

... via the track

The locomotive with built-in decoder is on the "Update track", which in turn is connected to the MXULF output marked "Schiene". Or a decoder is directly connected with its track input to the same outputs of the MXULF (the red and black wires).

Note:

As part of the update or sound upload process, the MXULF automatically removes the update lock (by programming CV #144 = 0) and turns off analog operation (CV #29, Bit 2 = 0). After the update or sound upload, the MXULF restores these CV values again.

If these automated programming steps are unsuccessful (i.e. a corresponding message in the display or suspicion in case of decoder without electric load and therefore no acknowledgments possible), they can be done manually with any DCC system before attempting a decoder update or sound upload by programming CV #144 = 0 and CV #29, Bit 2 = 0.

The update process (Initially: the MXULF is not connected to anything):

- **Connect power:**

LED (power) green → Sufficient voltage

MXULFA Display

MXULF.E SW 0.22
Vin=18 Vout=11,8

The currently installed MXULF software is shown (which is not the decoder software).

The letter immediately after "MXULF" denotes the MXULF hardware version. Also shown are the input voltage (planned) and the internally regulated output voltage (if possible @ 12V). NOTE: these measurements are taken without any load at the track output.

Special note for MXULF with software level 1 - 6:

The MXULF cannot yet check whether the input voltage is too low or possibly too high. Any input voltage is therefore internally regulated by the MXULFA to a maximum of 12.0V, to ensure decoders won't get damaged (16V if the decoder was recognized as large-scale).

- **Plug in the USB stick:**

If no suitable files are found on the stick's root memory: LED 1, LED 2 & LED 3 remain dark, if only a **decoder update file** is present → **LED 1 is yellow**, LED 2 & LED 3 remain dark, if only a **sound file** is present → LED 1 & LED 3 remain dark, **LED 2 is yellow**, if both update file and sound project is present → **LED 1 and LED 2 is yellow**, LED 3 is dark, if MXULF update file is present → **LED 3** flashes green-yellow-red.

MXULFA Display

SW 121022.zsu
Harzkamel-13.zpp

The display shows the names of the decoder update file (.zsu) and the sound project (.zpp) that were found on the USB stick. If the USB stick was already plugged in before the unit is powered up, the voltages are displayed first (see above) and 5 seconds later the display automatically switches to the file display. If several files of the same type (i.e. several sound files) are on the USB stick, only the latest one is shown (with the newest date). To see the complete list of files, press the R key for >1 sec, scroll down to the line "Update & Sound", briefly press the R key again, then scroll down to the desired file and press the R key once more.

Note for MXULF software level 1 - 4:

*File handling is not yet fully implemented; scrolling between files is not possible. It is therefore recommended to have **only one** decoder update file and/or **only one** sound project file in the root memory of the USB stick.*

- **Connect the loco decoder: after the decoder is recognized → LED (Schiene) turns yellow**

Note for MULF software level 1 - 6:

The MXULF does not know if there really is a decoder present, it only checks for current consumption.

MXULFA display up to Vers. 6

Track occupied
Ready for update

MXULFA from Vers. 7->

ZIMO Adr 3217
MX645 SW 32.00

Preview to Version 7 (when RailCom is active): The MXULF identifies and displays the decoder data; this information however (decoder type, current software version) is not important for the update or upload procedure. It is therefore NOT necessary to wait for them to be displayed, that is a software update (Button 1) or sound upload (Button 2) can be started immediately after connecting the decoder and the track LED (Schiene) lights up yellow.

For non-ZIMO decoders: Display shows manufacturer's name (i.e. ESU...) or "Hst xxx" (as per CV #8); other manufacturers don't use software sub-versions, only the version according to CV #7. Software updates or sound uploads with such decoders is of course not possible.

The MXULF may also be connected in reverse order, i.e. first the decoder followed by the USB stick; in this case the decoder information is displayed first, followed by the USB stick content. It is also possible to check the USB stick content after the decoder is displayed by removing and reconnecting the USB stick.

- **Update or sound-upload** is started with button 1 or 2 (the respective button is only operational if the associated LED and the track LED (Schiene) light up yellow):

Button 1 (= starts a software update) → **LED 1 and LED (Schiene) are flashing green**

Button 2 (= starts a sound upload) → **LED 2 and LED (Schiene) are flashing green**

After successfully completing a software update or sound upload

→ **LED (1 or 2) solid green** (stops flashing)

If unsuccessful: → **LED (1 or 2) flashes red.**

MXULFA display

SW 121022.zsu	First the CV's #29 and #144 are checked and if necessary changed to ensure that the update lock is not engaged and to disable the analog mode.
Read CV 29 & 144	
Write CV 144	
Write CV 29	LED 1 or 2 and LED (Schiene) are flashing green

SW 121022.zsu	Progress indicator during software update
Update 62 %	

or

Harzkamel-13.zpp	Progress indicator during sound upload
Upload 47 %	

to

Harzkamel-13.zpp	100 %
100 %	

Update OK	CV #29 and #144 are automatically set back to the original values. The corresponding LED is solid green.
CV 29 & 144 OK	

- **Confirm** a completed process by pressing the respective

button (1 or 2) → LED's again show the content of the USB stick (as after plugging it in), that is

if only a **decoder update file** is present → **LED 1 is yellow**, LED 2 remains dark

if only a **sound file** is present → LED 1 remains dark, **LED 2 is yellow**

if a **decoder update and a sound file** is present → **LED's 1 and 2 are yellow**

MXULFA display

SW 121022. zsu	File names are shown again (Decoder update file, sound project file) after confirmation.
Harzkamel-13.zpp	

Confirmation is only necessary if another update or sound upload for another decoder is to be performed. The unit may be turned off immediately without confirmation.

Fast sound upload via the "SUSI" interface
from MXULF-SW 0.62 and decoder-SW 35.00 (some decoders for test purposes from 34.10)
Sound upload in 3 – 4 min at full memory capacity (instead of 20 min through the track), also several decoders in parallel is possible.

In this case, the decoder is connected between its SUSI interface and the SUSI plug at the MXULF; if necessary via the decoder tester MXTAP. Several decoders may be connected in parallel.

The decoder does NOT need extra power, so **DON'T** connect it to the track inputs (see description below).

Decoder with on-board plugs (**Piux, MTC, Next**): The SUSI interface is integrated in these plugs; see the decoder manual regarding pin-out; connection with mating plugs, via the locomotive's decoder board or the **ZIMO decoder tester MXTAP**.

Hard-wire decoder: The SUSI interface is available as solder pads, see decoder manual for details.

MXULFA display

NO *.zsu File	If a Decoder sound file is found → LED 2 turns yellow The name of the sound file found on the USB stick is shown in the display. If several are on the stick, only the newest file is shown.
Harzkamel-13.zpp	

A decoder update file that happens to be on the USB stick has no influence on the sound upload via the SUSI interface, but would still be shown in the MXULF display (because the MXULF does not "know" that a "SUSI upload" is planned).

The procedure to enter the SUSI sound upload:

Connect the decoder to the SUSI port,
 press the R-Key (> 1 sec.) → MENU
 (the display can only show 2 lines at a time)
 select "SUSI SOUND UPLOAD", press R-Key

RESET
SUSI SOUND LOAD
FAHR
.....

NOTE: SUSI SOUND UPLOAD procedure was different in older SW versions of the MXULF: back then, if a SUSI sound upload was planned, power and the USB stick had to be connected BEFORE the decoder was allowed to be plugged in.

After entering the SUSI sound upload (by selecting and R-Key, see above):

NOTE: IF only one sound project (.zpp file) is on the USB stick, the upload via SUSI starts IMMEDIATELY and AUTOMATICALLY after entering the SUSI upload (with the R-Key). This automatic start-up enables a particularly efficient upload operation when doing a series of sound uploads.

IF several .zpp files are on the stick: Scroll to the desired file and start the upload with the R-Key!

Harzkamel-13.zpp	The upload progress is shown separate for each phase: clear memory (up to @ 3 seconds),
SUSI MemDel 3s	
SUSI LoadCV 36%	uploading CV lists, and
SUSI SoundLd 64%	sound files
Harzkamel-13.zpp	upload successful
SUSI 100%	
SUSI Timeout	upload failed; briefly unplug decoder and try again
Reset Key 1 - 4	

Press the R-Key to return to the menu. A new or repeated upload is possible from there.

6. Synchronized-Update for accessory decoder MX820, MX821

From SW version 0.50

This method solves a problem well known to operators of large layouts: Decoders built into turnout motors (i.e. LGB) must be removed and connected to the decoder update module one at a time, in order to update the decoder's software.

With this new synchronized update method, the accessory decoders can remain on the layout. The decoder update module MXULF(A) is connected to the layout in place of the command station and sends the new software to all accessory decoders. Every accessory decoder has the option to send a negative response to request repeated updates, until all decoders are up-to-date. Vehicles can normally remain on the track during this procedure.

ATTENTION: The power supply connected to the MXULF(A) is limited in its capacity. The power demanded by the connected loads (including vehicles that happen to be on the track), as well as the in-rush current at power-on, can cause the short-circuit protection to turn the unit off!

Starting a synchronized update procedure:

UPDATE & SOUND SOUND ► SYNC UPDATE OP PROG OP PROG ID+LD SERV PROG SERV PR ID+LD	← Menu after pressing/holding R button (the display can only show two lines, scroll down to see the rest) Select SYNC UPDATE by scrolling to the line and briefly press the R button.
--	--

The update module starts searching for existing accessory decoders on the layout (which are suitable for the synchronized update) and lists their total number found by decoder family.

ATTENTION: the search process may take some time to complete (about 2 sec per decoder).

This list of the decoder families is maintained over the entire update procedure; each row displays the current process for the corresponding family.

Searching first decoder family, numbers counting up	→	MX820 SEARCH 3
Finished searching, indicated by black dot	→	■ MX820 FOUND 7
Automatically searches for the next decoder family (MX821)	→	■ MX820 FOUND 7 ■ MX821 SEARCH 2
Search completed	→	■ MX820 FOUND 7 ■ MX821 FOUND 5

All finished searches are indicated by a dot on the left.

Start updates by:

- Briefly pressing the R button → Starts software updates for all decoder families
- or after 10 second timeout → (also) Starts software updates for all decoder families
- or scroll to a line and press the R button → Starts update of the selected decoder family only (all other decoder markings will be erased)

Update progress is shown (black marker flashes during update while % increases) →

■ MX820 SY-UP 68%
■ MX821 FOUND 5

Successful updates (of the 7 decoders found, 6 were updated) (The marker is removed from this line) →

MX820 OK 6 (7)
■ MX821 FOUND 5

Exit the synchronized update and return to the menu by pressing/holding the R button.

7. Driving with the MXULFA

Driving with the MXULF is also possible (without a display); but a MXULFA (or MXULF with added display) is strongly recommended if the driving function is used often.

The MXULFA is used in this example to explain how the driving function is used:



Action

Messages displayed (examples)

... after powering up the MXULF → MXULF,E SW 0.22
the track voltage is displayed (regulated to about 12 V) 11.6 Vout

▶ UPDATE & SOUND
DRIVE
OP PROG
OP PROG ID+LD
SERV PROG
SERV PR ID+LD

← **Press/hold the R button to go to the menu**

If the menu line DRIVE is not preselected, scroll down to DRIVE and briefly pressing the R button.

The driving mode is now active → DRIVE CVs read
The address and other important CV's are read-out automatically CV 18 = 184

Address, decoder type (i.e. MX645), SW-Version is shown → DRIVE Adr 3217
MX645 SW 32.00

or manufacturer's name (for non-ZIMO) or the value of CV #8 → DRIVE Adr 3217
(non-ZIMO decoders use only CV #7 as version) Hst xxx SW 32

If read-out is not possible → .DRIVE CV read out
not possible

Run engine with thumb wheel (speed) and R button (direction) → Forw 57 Adr 3217
F0, F1, F2 = 1,1,0

the display shows: Direction "Forw" (forward)"/"Rev" (reverse), speed step, shunting button (RG), RailCom feedback (RCom),

currently selected functions triplet F0,F1,F2; Functions are controlled with buttons 1, 2 and 3 (Press/hold button 2 or 3 switches to F3, F4, F5 or F6, F7, F8)

Direction button while driving (= emergency stop) → STOP
F6, F7, F8 = 0,0,1

Direction button at standstill (= changes direction) → Rev 0 Adr 3217
F0, F1, F2 = 1,1,0

Press/hold button 1, 2 or 3: Switches to other function's triplet → Rev 0 Adr 3217
F0, F1, F2 or F3, F4, F5 or F6, F7, F8. Example: Button 2 F3, F4, F5 = 0,0,0

Note: F0 is turned on automatically as well as F8, if defined for sound in CV #310

- ▶ UPDATE & SOUND
- DRIVE
- OP PROG
- OP PROG ID+LD
- SERV PROG
- SERV PR ID+LD

← **Press/hold R button: Exits driving mode and returns to menu**
Menu returns to previous state
Scroll to different menu line if needed
Select by briefly pressing the "R" button

8. CV Read/ Write with the MXULFA

```

UPDATE & SOUND
DRIVE
OP PROG
OP PROG ID+LD
▶SERV PROG
SERV PR ID+LD
    
```

← Enter the menu by pressing/holding the R button

Scroll to SERV PROG (or OP PROG) and enter by briefly pressing the R button

```

SERV PROG
CV
    
```

After entering with the R button you are prompted to enter a CV number

```

SERV PROG
CV 122 =
    
```

Use the scroll wheel to dial-in the desired CV number, press the R button

```

SERV PROG
CV 122 =136 ACK
    
```

Dial-in the CV value and press the R button. "ACK" = success.

```

SERV PROG
CV 122 =136 NACK
    
```

"NACK" indicates a failed programming step

```

SERV PROG
CV 122 = 0 READ
    
```

Press the "R" button again to read-out the CV

```

SERV PROG
CV 122 = N-RD
    
```

"N-RD" = Not Read, read-out failed

```

CV 122 =136 ACK
CV
    
```

Continue with reading or programming CV's, the previous line moves up

```

CV 122 =136 ACK
CV 123 =
    
```

Other CVs ...

```

CV 122 =136 ACK
CV 123 =
    
```

Press/hold the R button: Exits SERV PROG, back to the menu

Scroll-back to previous lines will be possible from software level 7 onwards.
 OP MODE: identical, but additionally shows "SENT" as acknowledgment (when no feedback is active)

Decoder-ID read-out and Load Code entry

```

UPDATE & SOUND
DRIVE
OP PROG
OP PROG ID+LD
SERV PROG
▶SERV PR ID+LC
    
```

← Menu after press/hold the R button

Scroll to SERV PR ID+LC and enter by briefly pressing the R button

```

SERV PROG ID =
221, 56,242,102
    
```

The decoder ID number is read and displayed (contained in CV's 250-253)

```

SERV PROG ID =
NO-READ
    
```

a failed read-out is indicated with "NO-READ"

```

SERV PROG LC =
    
```

Press the R button again to enter the load code entry (contained in CV's 260-263)

```

SERV PROG LC =
196, 67, 23,
    
```

Dial in the first value, advance to the next value with the "R" button. Repeat for the remaining two sets; delete numbers with button "3"

```

196, 67, 23,244
LC READ
    
```

or: instead of entering numbers, press the "R" button again to read out the load code

```

196, 67, 23,244
LC ACK
    
```

display, after entering the last set of numbers and "R" button (LC ACK = load code confirmed)

```

196, 67, 23,244
LC NACK
    
```

this indicates a failed programming (NACK = not acknowledged)

```

196, 67, 23,244
LC ACK
    
```

Exit by press/hold the R button

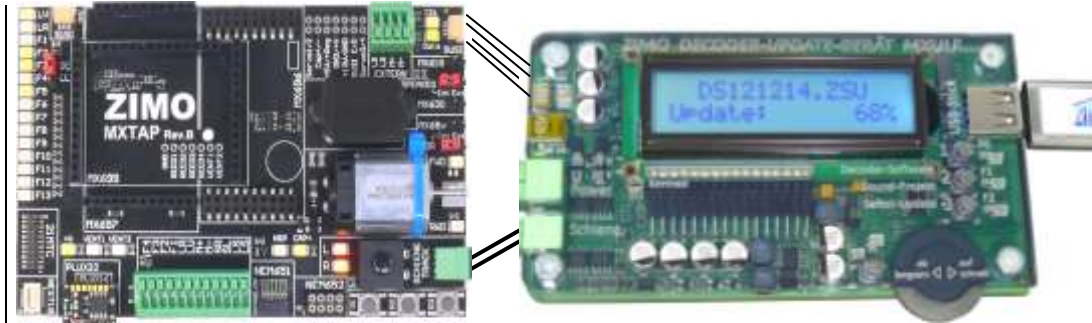
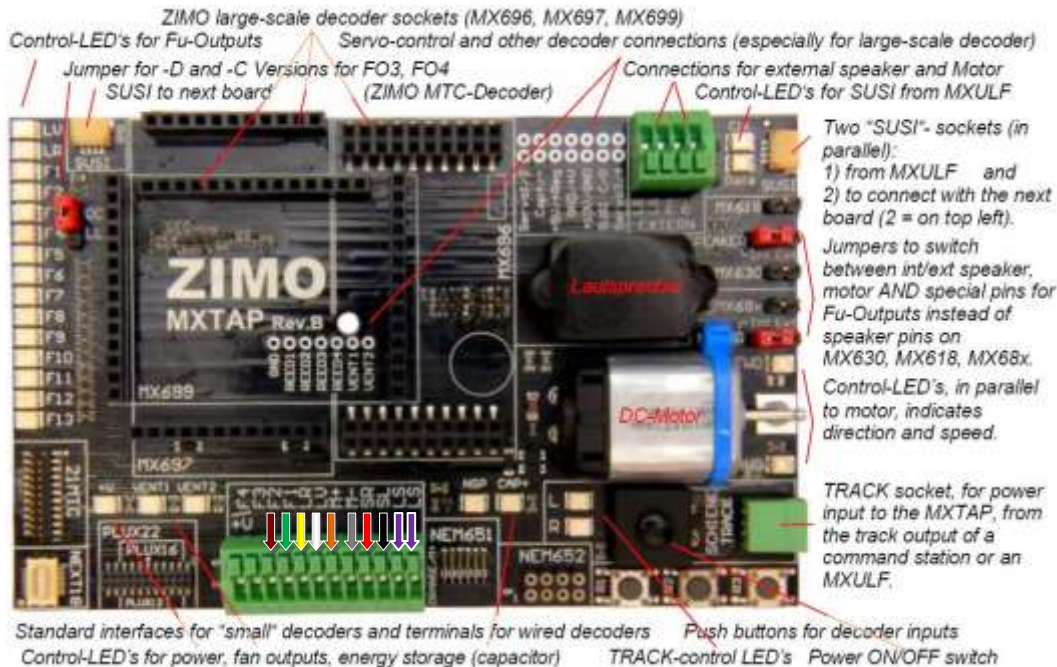
9. Decoder tester MXTAPS and MXTAPV

The ZIMO decoder test boards are preferably used together with the MXULF and MXULFA as well as the ZIMO command station MX10, but also with older ZIMO or third party DCC systems.

The principle features of these boards are:

- Provides mating plugs for all currently used ZIMO decoder connections (starting mid-2015), i.e. PluX12, -16, -22, Next18, MTC21, NEM651, NEM652 (all NMRA or VHDM standardized), as well as MX696, MX697, MX699 large-scale connectors (ZIMO proprietary).
Available in two versions - **MXTAPS** for small-scale decoders only small only, **MXTAPV** for all scales
- The decoder tester is connected to MXULF or ZIMO command stations or third-party DCC systems through the double-terminal "TRACK", and optionally (if available at the other device) through the "SUSI" cable.
- For decoder testing, the board contains: DC motor, speaker (1 Watt), various LEDs for function and fan outputs (large-scale), servo terminals (large-scale), and wire connections for external consumers.

The MXTAPS or MXTAPV can also be used with third-party products (decoders from other manufacturers): Naturally, the proper programming module from the respective manufacturer is also required for software updates and/or sound uploads of such decoders.



Connection between the MXULF (right) and MXTAPV (left):
2-conductor wire from "TRACK" to "TRACK" socket, 4-conductor "SUSI" cable (comes with the tester but is also available separately from ZIMO)



The 4-conductor "SUSI" cable SUSIKAB:

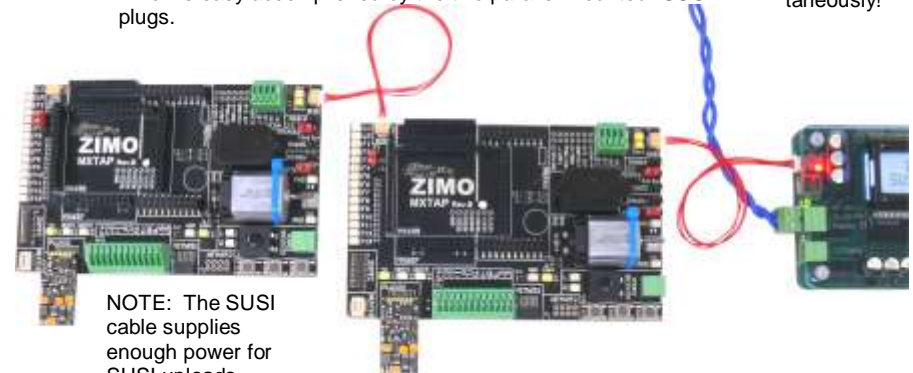
The decoder tester **MXTAPS** (or **MXTAPV**) is connected via the socket marked "TRACK" with the "TRACK" (or "SCHIENE") output of the MXULF, the track output of a ZIMO command station or a third-party command station. No other power supply is required.

The "SUSI" connections can also be used to connect the MXTAP with a MXULF (or a MX10 command station): a sound upload via "SUSI" is much faster than via the track output. With decoders that have the "PluX", "MTC" or "Next" connector, the SUSI outputs are also available at the "SUSI" interface of the **MXTAP** and can easily sent to the **MXULF**.

ATTENTION: Only one interface may be used at a time that is, it is NOT allowed to have several decoders plugged in to different sockets of the **MXTAPS** or **MXTAPV** at the same time.

Simultaneous sound-uploads to multiple decoders via "SUSI": Each decoder must be connected to a separate decoder test board MXTAP. The **test boards are connected in parallel**, which is easy accomplished by the two parallel mounted "SUSI" plugs.

ATTENTION:
Several **MX644** decoders **CANNOT** be uploaded simultaneously!

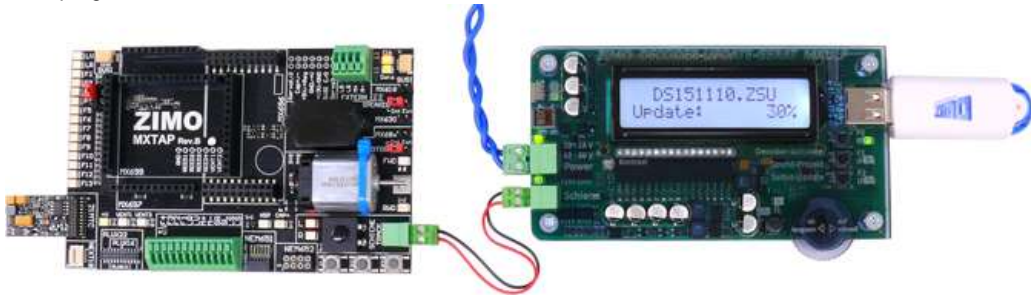


NOTE: The SUSI cable supplies enough power for SUSI uploads.

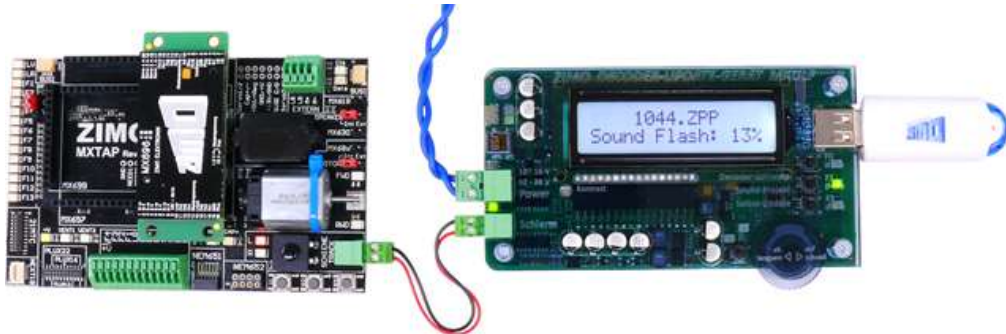
Hook-up key and wiring color for hard-wired decoders: LS = loud speakers | SL = Left rail | SR = Right rail | M- = Motor left | M+ = Motor right | LV = Front light | LR = Rear Light | F1 = FO1 | F2 = FO2 | F3 + F4 = FO3 & FO4.

TYPICAL APPLICATIONS:

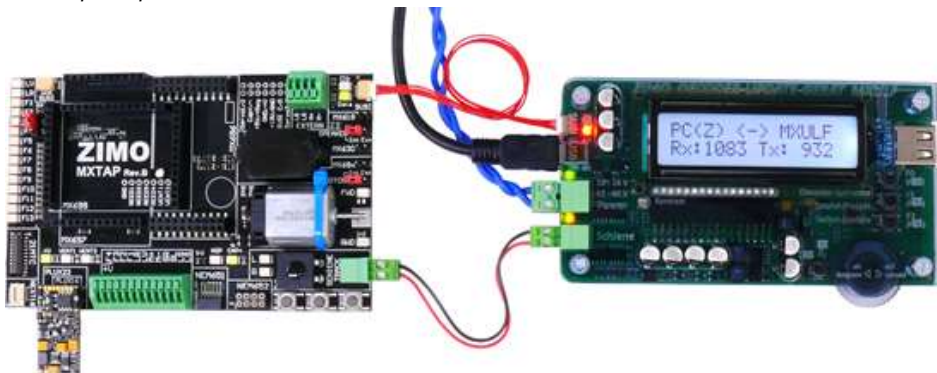
MXTAPV (or MXTAPS) with MX644D decoder (MTC plug), connected with MXULFA:
 The combination is powered via the "power" plug of the MXULFA (blue wire) and the 2-conductor cable between the "Track" sockets of the MXULFA and MXTAP. The display shows a **decoder update** in progress, the software comes **from the USB-Stick**.



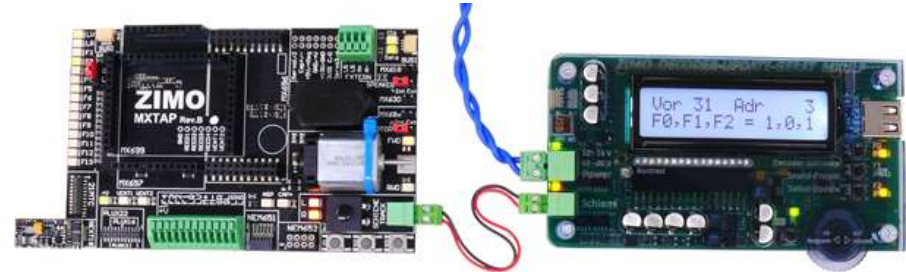
MXTAPV with a large-scale sound decoder MX696 plugged in and connected with the MXULFA:
 The MXULFA shows a **sound upload** in progress, the sound project comes **from the USB-Stick**.



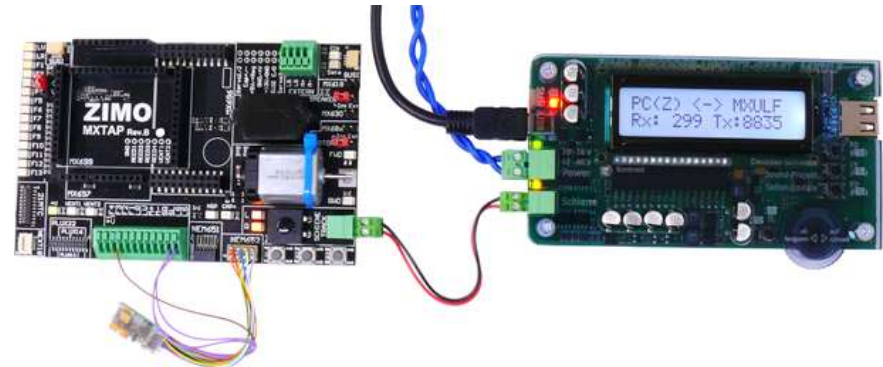
MXTAPV (or MXTAPS) with MX645P22 decoder (PluX22), connected with the MXULFA:
 Additionally connected with the **SUSI** cable (red cable) for **fast sound upload via SUSI (about 1 min instead of 20 min)**. This picture also shows a PC connection and the whole process is controlled by the PC, usually with the program ZSP (ZIMO Sound Programmer). The USB stick is therefore not needed and the only thing the MXULFA display shows is the communication between it and the PC. The upload process is shown on the PC.



MXTAPV (or MXTAPS) with MX648N18 decoder (Next interface) connected with the MXULFA:
 The MXULFA can also **test drive a locomotive**, using the display and the buttons/wheel as cab controls for speed, direction, functions etc. No other DCC equipment is needed.



MXTAPV (or MXTAPS) with MX648R decoder (8-pin plug, NEM652, the speaker wires are not on the plug, so they are connected to the wire terminal) connected with the MXULFA:
 In this case, the **locomotive test** is done with a computer (virtual cab in ZSP or ZCS), with the display only showing the established communication between the PC and MXULFA.



ATTENTION: For sound uploads on **large-scale sound decoders** use the decoder's own "SUSI" interface (SUSI socket); the SUSI interface is NOT on the decoder pins and therefore NOT on the SUSI socket of the MXTAPV either!

For this reason, the simultaneous sound upload of several large-scale sound decoders is NOT possible with the method described for "small" decoders (see previous page – with several MXTAPV's). Instead, a home-made device would have to be made for connecting "SUSI" cables in parallel.



10. The MXULF under computer control

The USB (client) interface of the MXULF (MXULFA) can be used with two different protocols for two different tasks:

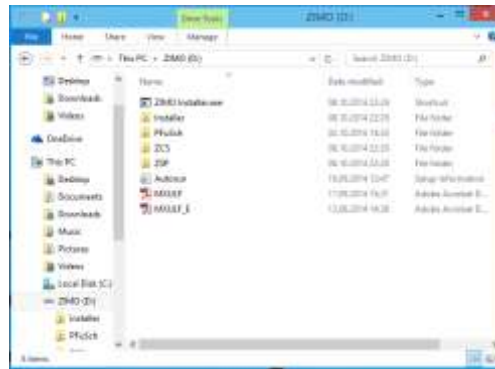
1. to update decoder software or upload sound with a PC (with program ZSP, ZCS or ZIRC); this is done with a special protocol that has already been used by the MX31ZL and
2. for CV programming as well as driving with a PC via the so-called binary protocol as it was used earlier with the RS232 interface of the "old" command station MX1 (Generation MX1 "compact", "multi-protocol"...). This has already been tested with the programs ZCS, ADaPT and TrainProgrammer (October 2014). Other programs will be added but need to be adapted and/or tested first.

Install MXULF driver and software from the "MXULF USB stick"

Each MXULF box comes with a "MXULF USB stick" which contains a Windows driver for the MXULF and some programs for updating and configuring ZIMO decoders.

Newer versions of the programs that come with the USB stick may be available at the [ZIMO web site](http://www.zimo.de) or the [web sites of the program vendors!](#)

Plug the USB stick in to the PC and open its location (i.e. in Windows Explorer). A list of contents is shown such as this



Double-click on the file "ZIMO Installer.exe" to install the MXULF driver.

Before connecting the MXULF with the PC, make sure it contains the software version 0.61.20 or newer. If not, update the MXULF first.

ATTENTION in case of an old Windows Operating system (XP or older):

If the installer cannot be opened, a .net framework from Microsoft must be downloaded and installed first:

<http://www.microsoft.com/de-at/download/details.aspx?id=1639>



The "MXULF USB stick" window lists beside the point "Install driver" also the programs located on the stick, among them ADaPT (PFuSch) and operating manuals (.pdf files), which may be installed as well.

NOTE: Shown here is a USB stick content from October 2014; later sticks may have other or additional possibilities.

If the MXULFA was bought as a "MXULFA-PF" (which includes a discounted ADaPT license), install and start the ADaPT program now. Go to "Register Information" and enter the code found on an accompanying paper.

Set-up and connect the MXULF with the computer

Power up the MXULF(A). Connect the MXULF's USB client interface (mini USB plug) with the computer using a USB cable. The communication starts automatically and is shown in the MXULFA display with "PC <- -> MXULF", byte-counter still at "0".

As soon as the user software is communicating with the MXULFA, the sent and received bytes are counted and displayed; identified with a "Z" = ZSP protocol used by the program ZSP or "B" + Binary protocol used by ZCS, ADaPT, TrainProgrammer and other (future) programs.

The communication between the user software and the MXULF is currently (October 2014) quite different among the various programs; but will be standardized shortly (i.e. largely automated).

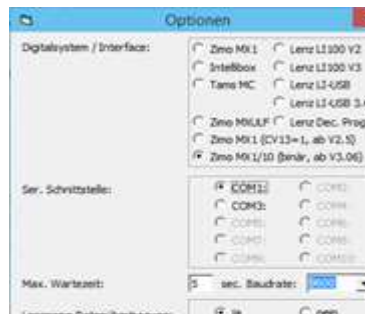
PC <-> MXULF
Rx: 0 Tx: 0

PC(Z) <-> MXULF
Rx: 492 Tx: 8512

PC(B) <-> MXULF
Rx: 492 Tx: 8512

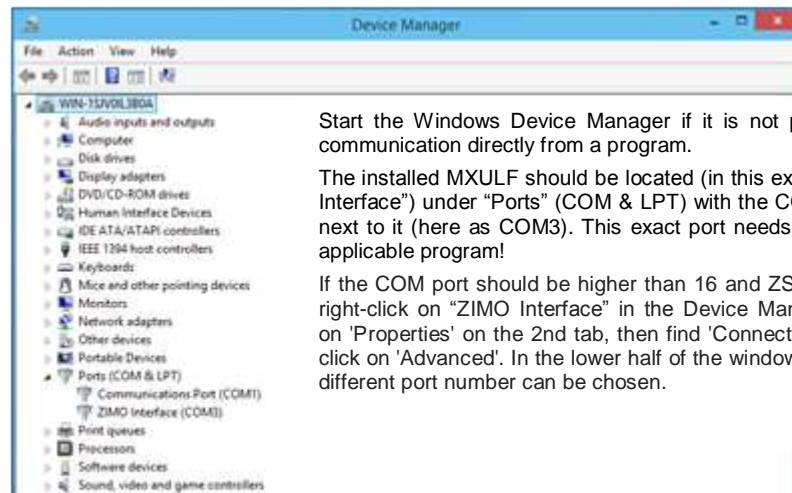
ZSP locates the correct port (which was assigned by Windows for the MXULF during the driver installation) automatically (since October 2014).

ZCS opens a set-up window after clicking on "?", where the proper COM port is either already suggested or can be selected from a pull-down window with the matching reference ("ZIMO Interface", "MX31ZL" or "MXULF").



Following the tab "Parameter" and "Options" opens a window in the program ADaPT where the COM port can be selected. It is often more convenient to use the Windows Device Manager for this, where the previously installed MXULF can be found under "ZIMO Interface", "MX31ZL" or "MXULF"; see below.

Find the installed MXULF with the Windows Device Manager:

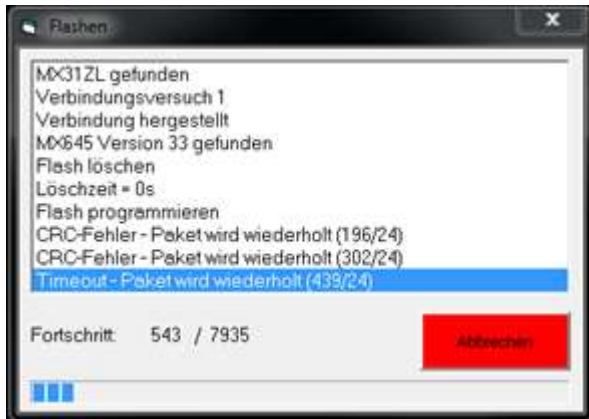


Start the Windows Device Manager if it is not possible to start communication directly from a program.

The installed MXULF should be located (in this example as "ZIMO Interface") under "Ports" (COM & LPT) with the COM port number next to it (here as COM3). This exact port needs to be set in the applicable program!

If the COM port should be higher than 16 and ZSP is to be used, right-click on "ZIMO Interface" in the Device Manager, then click on 'Properties' on the 2nd tab, then find 'Connection settings' and click on 'Advanced'. In the lower half of the window that appears, a different port number can be chosen.

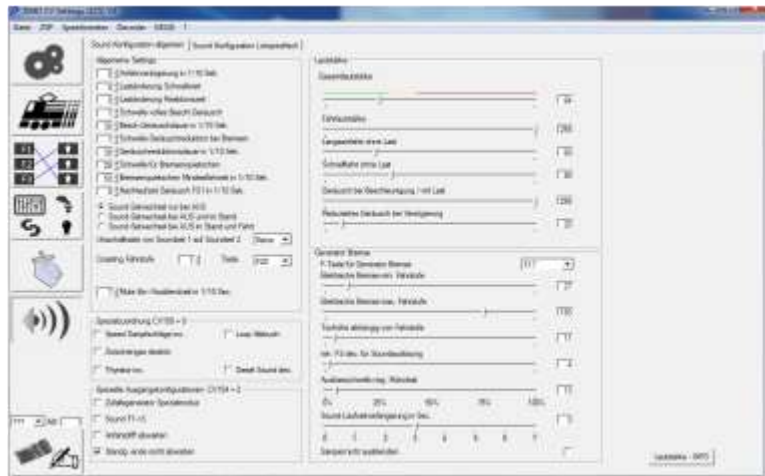
A selection of Windows Software for the MXULF(A)



NOTE: Pictures shown on this page are from German program versions.
All currently supported programs are available in English as well.

▲ **ZSP:** Display window during a decoder software update or sound upload procedure of a sound decoder MX645; the MXULF is identified as a MX31ZL (because of the similarities to the MXULF!).

ZCS ("ZIMO CV Setting", from Matthias Manhart, <http://www.beathis.ch/zcs/index.html>): Easy to use tool for decoder configurations with a number of windows, in special for modifying sound projects allowing adjustments in real time that is, the parameters can be changed while driving and the modifications take effect immediately.



▲ **ADaPT:** CV programming pages, Computer Cab for driving an engine by Ewald Sperrer (www.stp-software.at)

TrainProgrammer: Computer Cab for driving and engine by Freiwald Software (Railroad & Co; www.freiwald.com)

ZIRC - ATTENTION: This program has not been maintained for some time now (May 2014): Because of this you have to select "MX31ZL" under "Select update module" (instead of MXULF) and, because the online-update of the ZIRC is currently not functional, the desired file has to be downloaded from the ZIMO update or sound page first and then selected from your PC.

