

MX → MS – the replacement

With **software version 4.50**, two major milestones in the development of MS decoders have been reached:

the **mfX-mode**, and the alignment of a large part of the **DCC performance feature spectrum** (compared to the MX decoders).



Not all features known from the world of MX decoders are yet available for the MS decoders, but there are no more limitations for most applications and sound projects. Of course further software updates will be made available in the coming weeks and months, up to software version 5.00, where "nothing" should be missing by then.

For the current status: see operating instructions!

For those users for whom optimal sound is essential, an MS decoder can be recommended as the better choice.

There are already **a number of 16-bit sound projects**; and their number is growing rapidly. If there is no 16-bit project available for a certain model yet, this is no big limitation: MS decoders also accept 8-bit sound projects (from the MX world). A 16-bit project can then be loaded later, when available. Such a change is free of charge even for projects requiring a load code (i.e. surcharge). If the sound provider is identical, which is usually the case, the same load code applies.

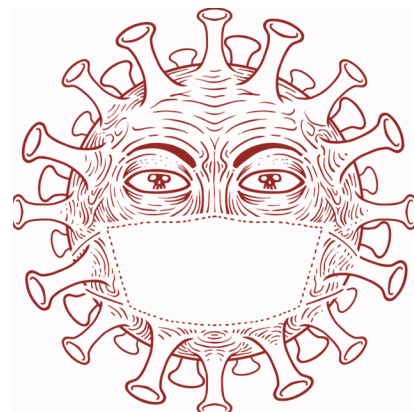
List of already (mid-October 2020) available and free 16-bit sound projects (extract from the ZIMO Sound Database):

| | | | | | |
|----------|-------|---------------|-------------------------|--|-----------------------------|
| Standard | Dampf | DRB / DB / DR | BR 56.20-29 (Pr. G 8.2) | Preloaded / Free - Petr Smutek (Jacek-modely)/ZIMO | 2018-09-06 |
| Standard | Dampf | DRB / DB / DR | BR 58 (Pr. G 12) | Coded / Coded - Alexander Mayer/Matthias Henning | 2017-10-08 |
| Standard | Dampf | DRB / DB / DR | BR 64 | Coded / Free / Coded / Coded - Alexander Mayer/ZIMO / Alexander Mayer/Matthias Henning | 2020-03-06 16Bit |
| Standard | Dampf | DRB / DB / DR | BR 78 (Pr. T 18) | Free / Coded - ZIMO/Georg Breuer | 2020-03-01 16Bit |
| Standard | Dampf | DRB / DB / DR | BR 80 | Coded / Free - Alexander Mayer/Oliver Zoffi | 2020-03-06 16Bit |
| Standard | Dampf | DRB / DB / DR | BR 86 | Coded / Free - Leo Sound Lab/ZIMO | 2020-04-30 16Bit NEW |
| Standard | Dampf | DRB / DB / DR | BR 89.70 (Pr. T 3) | Coded - Matthias Henning | 2014-07-11 |
| Standard | Dampf | DRB / DB / DR | BR 91.3 (Pr. T 9.3) | Coded - Alexander Mayer | 2020-09-29 16Bit NEW |
| Standard | Dampf | DRB / DB / DR | BR 94.5-17 (Pr. T 16.1) | Coded / Coded / Free - Alexander Mayer/Matthias Henning/Oliver Zoffi | 2020-07-17 16Bit NEW |
| Standard | Dampf | DRB / DR | BR 23 | Coded / Free - Alexander Mayer/ZIMO | 2019-10-04 |
| Standard | Dampf | DRB / DR | BR 43 | Free - ZIMO | 2013-09-30 |

The MS decoders are offered with loaded **sound collection** as standard, as was the case with MX decoders, but now of course in **16-bit version**.

At ZIMO, a "Sound Collection" is a special sound project that contains samples of 4 common types of locomotives (3 x steam, 1 x diesel). These can be selected via CV #265 (or mfx parameters) and can also be changed as often as desired. Of course, there is less storage capacity available for the individual vehicle in such a collection; therefore, an individual project is always the better choice, and for this reason there is an...

... offer (limited until the end of 2020) to **load any sound project** of your choice (as long as it is marked "Free - ZIMO" in the Sound Database) into the decoder **free of charge** instead of the "Sound-Collection". This means that the otherwise charged handling costs of 9.00 EUR are dropped.



Kostenloses Bild von Gordon Johnson auf Pixabay

Unfortunately another newsletter with this "logo"... We hope that in the next or at least the following newsletter the virus can be overwritten with an **X**.

In meanwhile we are expanding our **Video workshop offer**

Although it was set up on the occasion of the pandemic, it will continue to exist "afterwards".

An extensive programme is planned for the coming months:

Firstly, there are several aspects of the new MS decoders, i.e. the special topics for which separate workshops are planned:

- **mfX operation with Märklin CS**
- **'Swiss mapping' of the MS era**
- **MS decoders for large scale**
- **Configuration and GUI via ZCS**

As the title suggests, the latter (not necessarily the last one in terms of timing) concerns both decoders and the system (where the GUI is used).

For the system itself, workshops are also planned; these will cover the following topics::

- **The 'StEin' and it's configuration**
- **Interlocking technology with ESTWGI**
- **Interlocking technology with STP**
- **MX32 → MX33 the 2nd replacement**

Workshops on system and interlocking technology place special demands on presentation technology and demonstration equipment.

Preparations are therefore being made at ZIMO in this direction: the renovation of the (almost historical) "turntable layout", the expansion of the "H0 demo layout", and the construction of a room for holding workshops with permanently installed cameras.

Notes on MXULF for MS

As of **SW version 0.83.15**, the decoder update and sound loading device MXULF is able to perform the following tasks for MS decoders:

- Software update from USB stick (SW collection file) via tracks.
- Sound project loading from USB stick via track.
- ... also via SUSI.
- Sound project loading directly from Computer (ZSP) via SUSI.

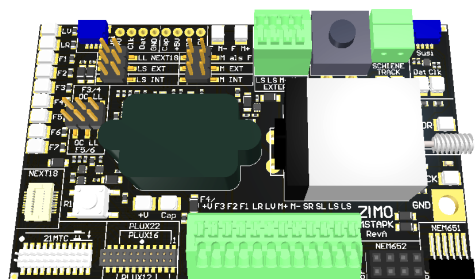
So this version still lacks SW update and sound project loading directly from the computer (ZSP) via track.

Caution when using the MXTAP test and connection board with MS440 decoders:

MXTAP is a development of the MX era; although it can also be used for MS decoders, some particularities have to be considered:

- The index pin of the MTC plug on the MXTAP is cut off, but the "stub" can pierce the solder lacquer on the MS440, contact a conductor track (on MX decoders MX644 none at this point) and destroy a diode (do not press it firmly for safety)
- The function outputs starting from FO3 now occupy different pins due to adaptation to the valid NMRA standard; therefore display LEDs or designations do not match.
- The pin assignment of the MS large scale decoder is similar, but not completely identical to MX.

Thus, an **MSTAPK** is offered though, but it only contains the connectors for the "small" MS decoders, not for large scale decoders; for latter an **MSTAPG** is in preparation.



Continued from page 1: **MX** → **MS** – the replacement.

Apart from the 16-bit sound there are other advantages of the MS technology, for example the greatly extended possibilities for connecting "stay-alives" (i.e. energy storage to bridge dead spots in tracks) to a certain extent by integrated capacitors (see decoder MS580) or by providing for the connection of external electrolytic capacitors and gold caps.

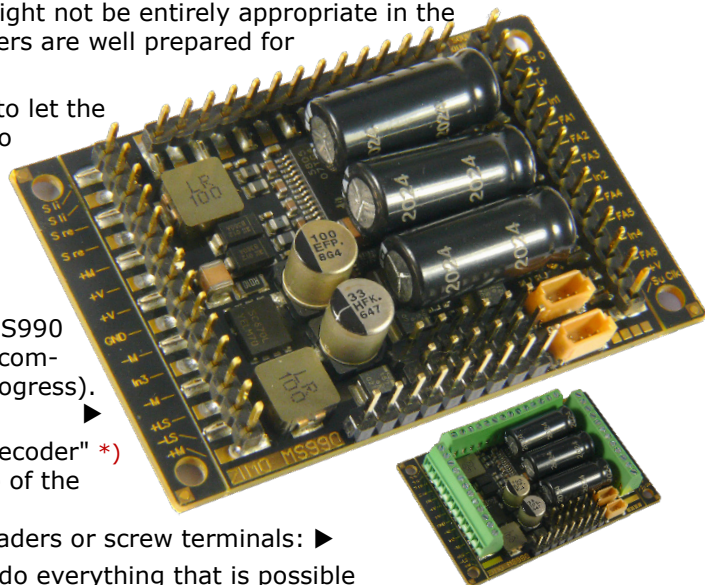
See also: Operating instructions or Newsletter April 2020

Above all, however, the **new processor and memory technology** of the MS decoders offers an incomparably larger space compared to MX for future extensions to be supplemented by software updates; published benchmark tests of the processor type built into MS decoders confirm at least 10 times the computing power compared to the processors built into MX sound decoders.

The **operating technology of the prototype**, which is in a state of upheaval, will increasingly affect model railways, and this requires, among other things, ever higher performance of the vehicle electronics, for which the term "decoder" might not be entirely appropriate in the future. The MS decoders are well prepared for these requirements.

Of course ZIMO tries to let the MX decoders grow into new times as far as possible, but there are limitations.

Meanwhile also the large-scale decoder MS990 (hardware) has been completed (software in progress).



The "big large scale decoder" *) MS990 is the Flagship of the ZIMO decoder range; optionally with pin headers or screw terminals: ►

It contains and "can" do everything that is possible today at reasonable cost. In many respects this is more than previous ZIMO large scale decoders have offered as well as other "big ones".

To sum up in a few key words:

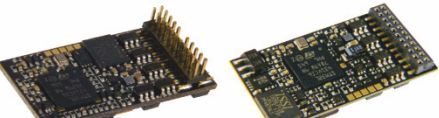
6 A Motor/total current with synchronous rectifier to avoid waste heat | **15** Function outputs | **3** „Stay-alive“ supercaps | **2** fixed and **1** variable low voltage | **2** independent loudspeaker outputs („Stereo“) | **2 x 10 W** Sound power | **2** independent connections for smoke generators without own electronics, each with its own fans | **6** three-pole servo connections | **1** gyroscopic sensor | **2** independent SUSI interfaces with auxiliary operating modes.

*) besides the "big" one there is also a "small large scale decoder", the MS950, especially for gauge 0 (or as a "replacement" when space is limited in G-gauge).

BTW: ZIMO does NOT use the term "large scale sound decoder" here, because sound today is or should be a matter of course - at least for the big ones. A splitting of the functionality into "driving decoder" and "sound module" is superfluous with today's technology - that's why there are no separate (SUSI) sound modules from ZIMO.

For detailed data, please refer to the manual and the April Newsletter.

Overview table of the other (i.e. small and gauge-0) MS-Sound decoders with the most important **technical data**:

| | | | | | | | | | | |
|--|-------------------------|---|---|-------------------------|--|--|-------------------------------------|---|--|-----------------------|
|  | | |  | | |  | |  | | |
| Standard HO | | | Miniature | | | Next | | Large Scale | | |
| MS450, <i>MS450R, MS450F</i> | MS450P22 | MS440C/D <i>MTC acc.to VHDM std. MTC variant ZIMO</i> | MS480, <i>MS480R, MS480F</i> | MS480P16 | MS490, <i>MS490R, MS490F</i> | MS490N, L | MS580N18 <i>MS580N18G</i> | MS590N18 | MS950 <i>MS950 in development, CAD-Drawing avail. approx. 1st quarter 2021</i> | MS990L, K |
| 30 x 15 x 4 | 30 x 15 x 4 | 30 x 15 x 4 | 19 x 11 x 3.1 | 19 x 11 x 3.1 | 19 x 8.6 x 2.9 | 19 x 8.6 x 2.9 | 25 x 10.5 x 4 | 15 x 9.5 x 3.5 | 50 x 23 x 13 | 50 x 40 x 13 |
| 13 wires | PluX-22 | 21MTC , FA3-FA6 logic-level (std.) / „amplified“ outputs | 11 wires | PluX-16 | 11 wires | NEM-651 <i>direkt</i> | Next18 | Next18 | <i>pin connection / or screw terminals</i> | <i>2 x 10 W sound</i> |
| <i>NEM-652, NEM-651</i> | ← 3 W sound → | | <i>NEM-652, NEM-651</i> | ← 1 W sound → | <i>NEM-652, NEM-651</i> | | | ← 1 W sound → | 2 x 3 W sound | 2 x 10 W sound |
| 1.2 A (peak: 2.5 A) | 1.2 A (2.5 A) | 1.2 A (2.5 A) | 0.8 A (1.5 A) | 0.8 A (1.5 A) | 0.7 A (1.5 A) | 0.7 A (1.5 A) | 0.8 A (1.5 A) | 0.7 A (1.5 A) | 4 A (10 A) | 6 A (10 A) |

GUI design for MX32 (MX33) controllers on computer with ZCS

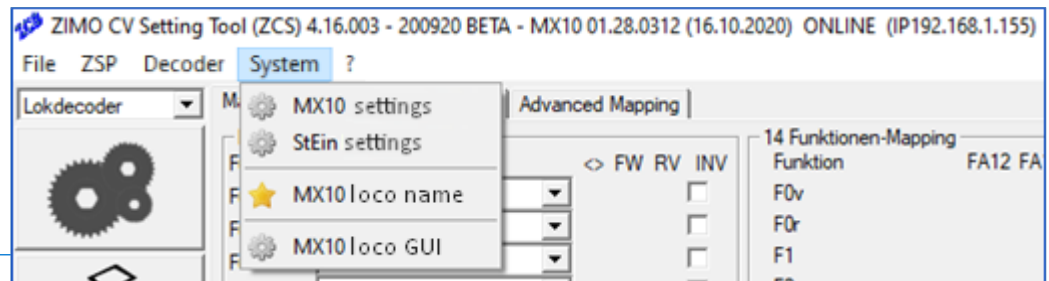
ZCS - **ZIMO CV Setting** – the tool for decoder configuration by **Matthias Manhart** – increasingly takes over **system configuration** tasks.

With the new version 4.16.000 of ZCS on the one hand

- settings of the MX10 parameters (menu item "MX10 settings", voltages, currents, ... and what else is shown and adjusted on the MX10 display) can be made, and on the other hand - this is new!
- **the GUI elements (GUI = Graphical User Interface)** of the vehicles are determined or modified, i.e. name, image, speedometer design and parameters as well as function symbols. The GUI is used to display the vehicles on the screen of the MX32/MX33 controllers.


On the menu bar (top) of the ZCS, select "System", and then "MX10 loco GUI":

there you can define name, loco image, speedo design and data, as well as function symbols, which are to form the GUI on the control panel for the set address.



MX10 Lok GUI


Lok-Adresse: 602 MX10 Lesen MX10 Schreiben

Lok-Name: MikeTest 2046 

Loktyp: Dampflok 1

Epoche: Epoche 3 (1945-1970) 3

Land: Deutschland 276

Loktacho: 

Vmax vorwärts [km/h]: 150

Vmax rückwärts [km/h]: 0

Vmax Rangier [km/h]: 0

Funktionstasten:

| | | | | | |
|---------|---------|---------|----------|----------|----------|
| 0: | 1: | 2: | 10: F10 | 11: F11 | 12: F12 |
| 741: | 800: | 753: | 710: F13 | 711: F14 | 712: F15 |
| 754: | 785: | 803: | 713: F16 | 714: F17 | 715: F18 |
| 6: | 855: | 850: | 716: | 717: | 718: |
| 853: | 802: | | | | |
| 20: F20 | 21: F21 | 22: F22 | 30: | 31: | 32: |
| 720: | 721: | 722: | 600: | 600: | 600: |
| 23: F23 | 24: F24 | 25: F25 | 33: | 34: | 35: |
| 723: | 724: | 725: | 600: | 600: | 600: |
| 26: F26 | 27: F27 | 28: F28 | 36: | 37: | 38: |
| 726: | 727: | 728: | 600: | 600: | 600: |
| 40: | 41: | 42: | 50: | 51: | 52: |
| 600: | 600: | 600: | 600: | 600: | 600: |
| 43: | 44: | 45: | 53: | 54: | 55: |
| 600: | 600: | 600: | 600: | 600: | 600: |
| 46: | 47: | 48: | 56: | 57: | 58: |
| 600: | 600: | 600: | 600: | 600: | 600: |

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Schliessen Standardeinstellungen Datei öffnen Datei speichern

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BR 98.3 Dampflok nicht def

Dampfspeicher Dampflok nicht def

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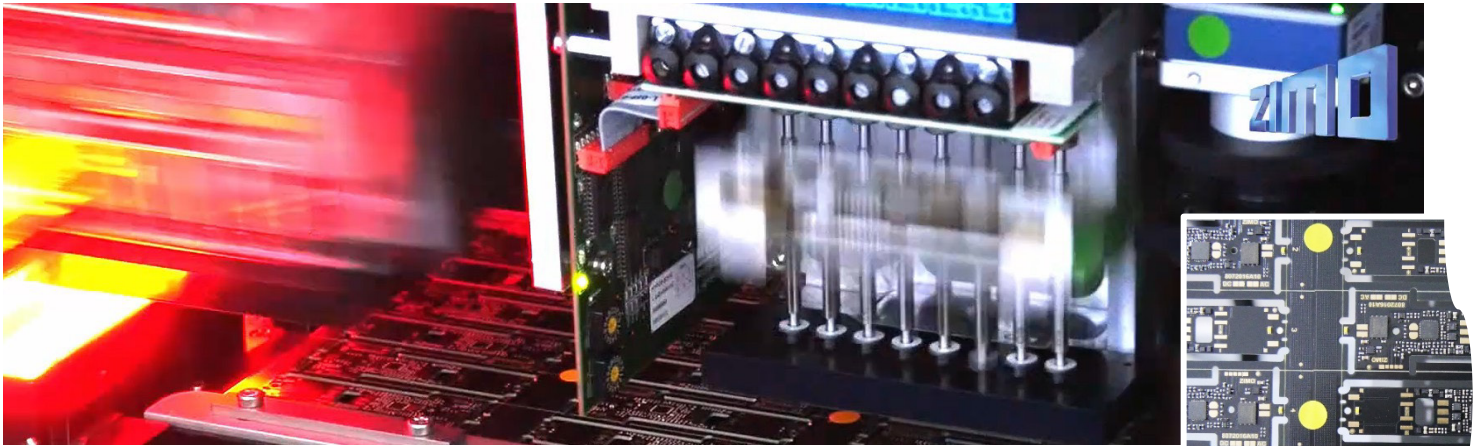


MX10 Funktionstasten

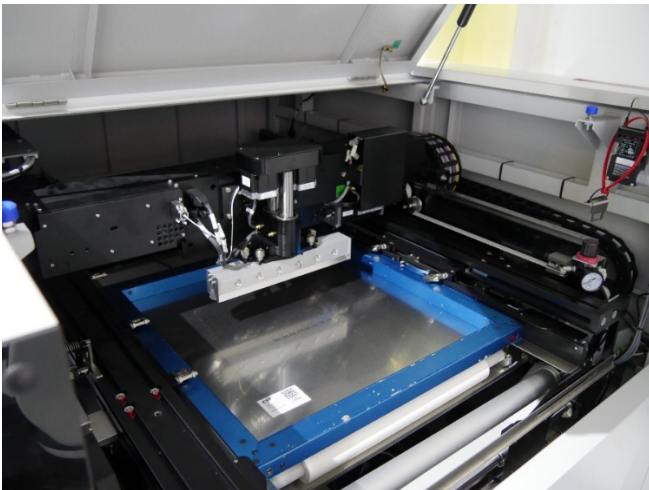
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The new SMD production line at ZIMO

ZIMO manufactures all products in-house; this is the only way to offer the wide range of products, especially in the decoder sector. In 2020 (for the fourth time in the company's history) new production machines were purchased to meet the increasing demands for quantity, miniaturisation and quality.

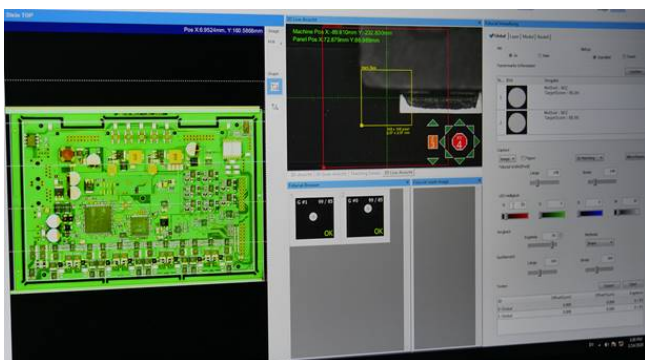


SMD Placement machine: View of one of the 8-fold placement heads, which take up to 40,000 chips (~ 200 sound decoders) per hour from the racks and place them precisely (0.02 mm) on the board. On the left side of the picture (shining red, in fast motion) the laser unit for the optical control of the components can be seen. 'Individual sound decoders' are currently being manufactured (in the picture); these are "tailor-made" for vehicle manufacturers if there is no space for standard decoders.

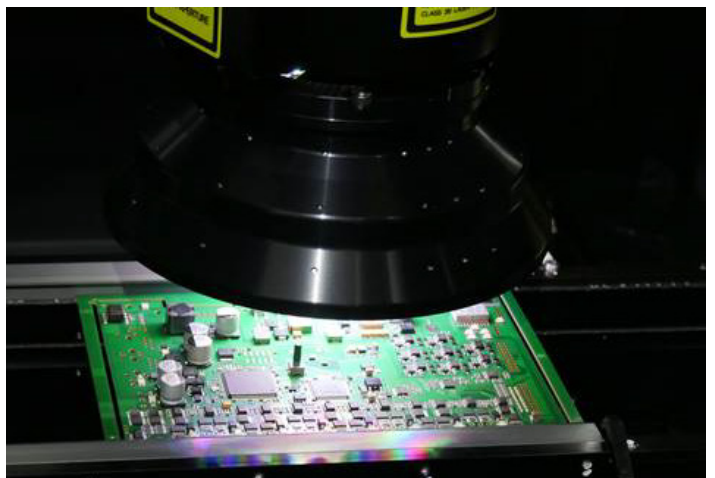


ZIMO video workshops
info and dates at www.zimo.at

Before the placement can be done (top), the soldering paste is applied: in the stencil printing machine a squeegee is guided over an individually manufactured stencil and presses the paste through its high-precision openings onto the soldering points of the circuit board below. Integrated cameras control the perfect result of this process.



The entire production process is aimed at achieving the highest possible quality by means of checks at each stage. Particularly important is the optical final inspection in the 3D AOI system (Automated Optical Inspection). A large laser head, supplemented by cameras, scans the entire board, creates a height profile and, in addition to the presence and position of the assembled electronic components, checks above all the correct formation of the individual solder joints, because so-called "cold" solder joints are among the greatest failure risks of electronics during their life cycle. The current BGA components (Ball Grid Arrays), which are essential for the continued miniaturisation, can also be effectively checked for reliable contacting by exact measurement of the assembly planarity.



New software version for StEin: 7.1.80

Bug fixing of the current measurement on the track outputs. This was incorrectly calibrated by 25%, resulting in premature response of overcurrent and short-circuit thresholds (e.g. at 2 A, although 2.5 A according to configuration); noticeable only at higher loads (near the maximum of 8 A of e.g. gauge 1 locomotives in consist).