Digital 2020

www.zimo.at

MADE IN AUSTRIA

Decoders →

The System

170 x 200 x 40 mm

MX10 „big" version

Highest performance with the latest technology,

recognizable among other things by the small dimensions of the digital central unit MX10, which brings 20 A on the rail (600 watts total output) and manages without a fan. Both the central unit and the controllers are equipped with generously dimensioned processor and memory capacity, necessary for decentralized intelligence.

140 x 170 x 40 mm

MX10 EConomy

Digital centrals: The „big" MX10 vs. the „EConomy" command station MX10EC

The MX10 has two rail outputs: "rail 1" with 12 A and "rail 2" with 8 A; the MX10EC version is based on the hardware and software of the MX10, but does not have the " rail 2" output. Neverthelessboth versions, so also the MX10EC, are called high performance digital control panels.Most features of MX10 and MX10EC are identical: the finely adjustable voltages, Overcurrent thresholds, tolerance limits, the short-circuit spark suppression, the RailCom precision detector, CAN buses, "MiWi" radio, XPressNet, LAN for communication with Apps, Roco WLANMAUS and interlocking systems.The "full version" MX10 also has a built-in sound generator, more power for auxiliary voltages, more ABA pins, a USB client interface (MX10EC has "only" Ethernet), and a Loconet interface (not yet in use).

ZIMO controllers in the year 2020: from MX32 to MX33

ZIMO digital system controllers are traditionally referred to as "control desks"; their shape allows them to be used either as tabletop units or walk-around manual controllers. The new MX33 brings a formal and ergonomic upgrade, but also potential for future enhancements through software updates.

Right from the start, the MX33 controllers (and the MX33FU radio version) offer a larger screen (2.8 inches instead of 2.4) and the capacitive multi-touch glass, additional buttons (for stop handling and east-west direction), RGB LEDs (all colours can be displayed, integrated in the buttons), etc.

CAD drawing

Stationary equipement modul

One "StEin" is more than a pure synergy of elements

The StEin

StEin expansion boards at upper connectors
for 8 additional switches (coils, motor, servos), and 16 inputs

REPLACES a collection of occupancy detectors, RailCom detectors, accessory decoders, etc.

StEin = TRACK SECTION MODULE
Fully functional track sections with detection of occupancy and train number, RailCom local/global, overcurrent (short circuit) treatment, and ZIMO "HLU" train control.
The combination of continuous and intermittant ATPs allows a special stopping point accuracy, means a cost saving and brings the ZIMO system to the way to ETCS (European Train Control System).

StEin = Signal-MODUL
Signals are not connected directly, but via the outsourced "ICA boards" for mounting in close proximity to the respective signals. Up to 12 boards are powered and controlled from the I²C bus connector of each StEin: each ICA board has 16 outputs for signal LEDs.

StEin 88V

StEin = SWITCH-MODULE
for all types of switch drives and feedback signals, two-way, three-way, comprehensive parameterisation.
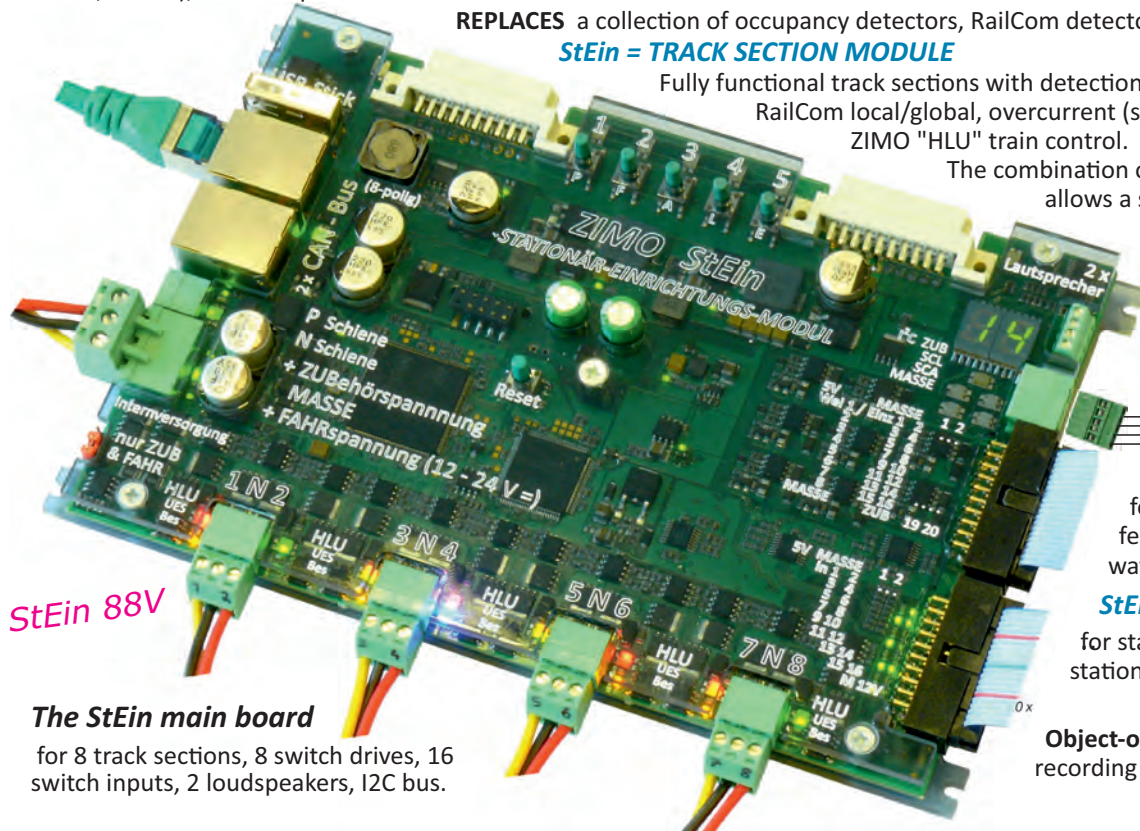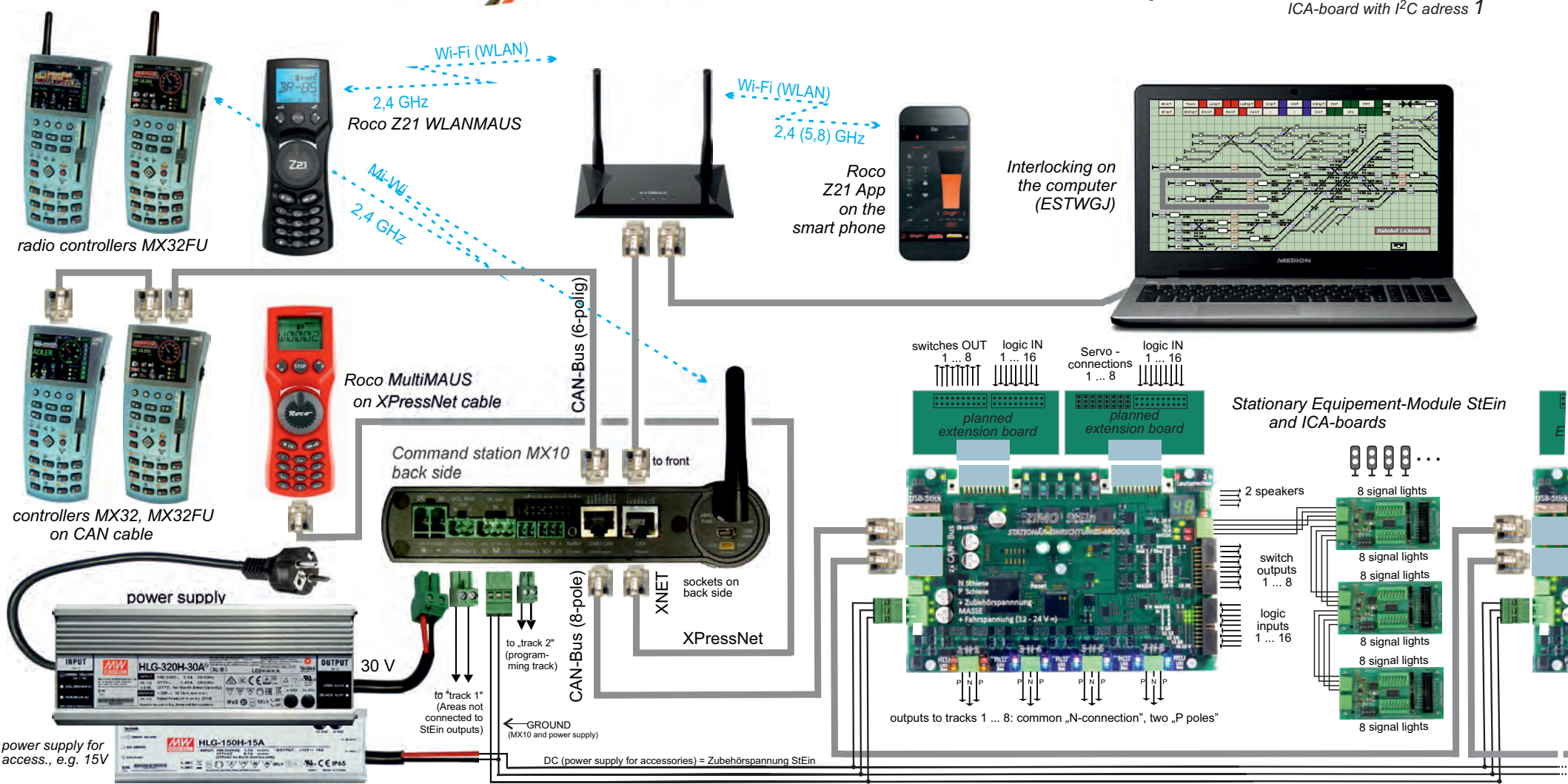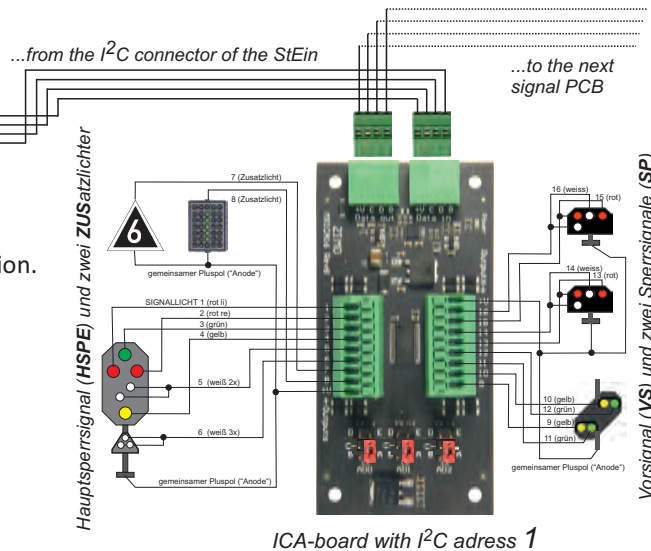
StEin = SOUND MODULE
for station announcements and all stationary railway noise.

Object-oriented approach and tabular recording of the configuration.

The StEin main board
for 8 track sections, 8 switch drives, 16 switch inputs, 2 loudspeakers, I2C bus.

...from the I²C connector of the StEin

...to the next signal PCB

Hauptsperrsignal (HSPE) und zwei ZUSatzlichter

Vorsignal (VS) und zwei Sperrsignale (SP)

ICA-board with I²C adress 1

Wi-Fi (WLAN)

2,4 GHz

Roco Z21 WLANMAUS

Wi-Fi (WLAN)

2,4 (5,8) GHz

Roco Z21 App on the smart phone

Interlocking on the computer (ESTWGJ)

radio controllers MX32FU

MiWi

2,4 GHz

Roco MultiMAUS on XPressNet cable

CAN-Bus (6-polig)

controllers MX32, MX32FU on CAN cable

Command station MX10 back side

to front

CAN-Bus (8-pole)

XNET

sockets on back side

XPressNet

switches OUT 1 ... 8

logic IN 1 ... 16

Servo - connections 1 ... 8

logic IN 1 ... 16

planned extension board

planned extension board

Stationary Equipement-Module StEin and ICA-boards

2 speakers

8 signal lights

switch outputs 1 ... 8

8 signal lights

8 signal lights

logic inputs 1 ... 16

8 signal lights

8 signal lights

8 signal lights

power supply

30 V

to „track 2" (programming track)

to „track 1" (Areas not connected to StEin outputs)

GROUND (MX10 and power supply)

power supply for access., e.g. 15V

outputs to tracks 1 ... 8: common „N-connection", two „P poles"

DC (power supply for accessories) = Zubehörspannung StEin

DC S1 (MX10, running voltage on track/Schiene 1) = Fahrspannung StEin

MS - SOUND-DECODERS

MS450P22

30 x 15 x 4 mm

REAL 16 bits audio - **22 or 44 kHz** sample rate - **16** channels - **128 Mbit** memory

The **REAL 16 bits** refer to the complete sound project: from the sound files stored in the flash memory, to the I2S-bus (=Inter-IC-Sound) for playback in stereo, to the fully digital Class "D" amplifier.

22 kHz sample rate by default, but also (defined by the sound project) sound channels of **11 kHz** for simpler sounds (e.g. station announcements) and **44 kHz** for sounds of maximum hifi quality.

128 Mbit sound memory means 360 sec playback time of high quality (16 bits / 22 kHz); using the memory economically (8 bits / 11kHz) makes up to 1440 sec playback time possible (neglecting the overhead).

16 Sound channels can be played back simultaneously and adjusted individually, and can also be distributed to two speakers in "stereo decoders" (especially, but not limited to, large-scale decoders).

The *timbres* of driving sounds (e.g.: chuff sounds, diesel engine, whistles, horns, ...) can be adjusted via high and low pass filters via CV configuration.

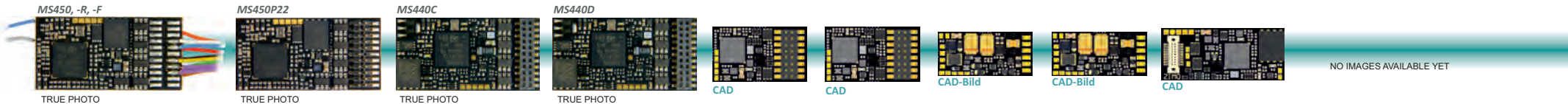*Note!* Even "old" (not converted) 8 bit sound projects do sound better with the MS hardware!

Multiprotocol: DCC, mfx, MM

Introducing the MS generation, ZIMO decoders do not only work with DCC and MM, like all ZIMO decoders, but also with the **mfx track format**, including RDS feedback and automatic **registration** with mfx central stations. They also work in analog operation, AC and DC, of course.
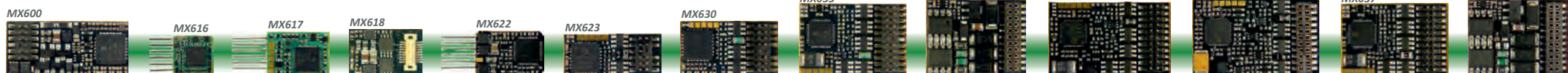
MS decoders as successors of the MX decoders

The new sound decoders contain many components which are important for the performance. Some of the most important are a state-of-the-art 32 bits ARM processor and DSP properties. Many things are new, but the MS decoders still represent a continuous development of the MX decoders: the well-proven power electronics (rectifier, amplifiers) were adopted, as well as the construction types and interfaces.

NOTE: The MX decoders will not be removed from ZIMO's product range, and are still offered - as long as there is demand. Due to the fact that the old decoders are continuously being developed, also during the development of the new decoders, there may be some situations where the MX decoders have an advantage.

MS450, -R, -F | MS450P22 | MS440C | MS440D

TRUE PHOTO | TRUE PHOTO | TRUE PHOTO | TRUE PHOTO | CAD | CAD | CAD-Bild | CAD-Bild | CAD | NO IMAGES AVAILABLE YET

(MS490 is NOT mfx capable!)

MS Decoders (Sound)	MS450, MS450R, MS450F	MS450P22	MS440C MTC acc. VHDM Std.	MS440D MTC variant ZIMO	MS480, MS480R, MS480F	MS480P16	MS490, MS490R, MS490F	MS490N, L	MS580N18	MS960V, S	MS990 -KV, -KS, -LV, LS
	Standard H0				Miniature				Next		Large Scale
Dimensions (mm)	30 x 15 x 4	30 x 15 x 4	30 x 15 x 4	30 x 15 x 4	19 x 11 x 3,5	19 x 11 x 3,5	19 x 8,6 x 3,5	19 x 8,6 x 3,5	25 x 10,5 x 4	55 x 25 x 13	50 x 40 x 13
Connections *Wires and/or standardized interfaces*	**13 wires** NEM-652, NEM-651	**PluX**-22	**21MTC** FO3, FO4, FO5, FO6 logiq level (std.)	**21MTC** FO3, FO4, FO5, FO6 "amplified" outputs	**11 wires** NEM-652, NEM-651	**PluX**-16	**11 wires** NEM-652, NEM-651	**NEM-651** directly	**Next18**	**pin connection**	**pin conn. or screw terminals**
Continuous Current motor+sound+FOs (peak)	1.2 A (2.5 A)	1.2 A (2.5 A)	1,2 A	1,2 A	0,8 A	0,8 A	0,7 A	0,7 A	0,8 A	4 A	6 A
Function Outputs incl. 2 x headlights (+ logic-level outputs)	10 4 with wires 6 on s.pads (+ 2 logic level)	10 9 on plug 1 on s.pad (+ 2 logic level)	8 4 on plug, 4 on s.pad (+ 6 logic level)	8 all 8 on plug	6 4 with wires, 2 on s.pad (+ 2 logic level)	5 4 on plug, 1 on s.pad (+ 2 logic level)	4 all 4 with wires (+ 2 logic level)	4 2 on plug, 2 on s.pad (+ 2 logic level)	4 all on plug (+ 2 logic level)	8 or 14	8 or 14
Servo - control lines (complete with 5V supply)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	4 servo wires	4 full feat. 3-pole servo connections (YES)
SUSI - connection alternatively SUSI, I2C, sound loading	yes alternate use of logic-level on s.pads	yes alternate use of logic-level on PluX	yes alternate use of logic-level on MTC	yes alternate use of logic-level on MTC	yes alternate use of logic-level on s.pads	yes alternate use of logic-level on PluX	yes alternate use of logic-level on s.pads	yes alternate use of logic-level on s.pads	yes alternate use of logic-level on s.pads	yes	yes indiv. 4-pol. SUSI conn.
Switching Inputs for cam sensors, Reed switches, i.a.	1 on s.pads +2 alternate use of logic-level	1 on s.pads +2 alternate use of logic-level	2 on MTC +2 alternate use of logic-level	2 on MTC +2 alternate use of logic-level	2 alternate use of logic-level	2 alternate use of logic-level	2 alternate use of logic-level	2 alternate use of logic-level	2 alternate use of logic-level	3 on pin connector or screw terminals	3 on pin connector or screw terminals
Energy Storage - connect. 15V - capacitors DIRECTLY on the decoder	yes with wires (no limit)	yes on PluX (no limit)	yes on s.pads (no limit)	yes on s.pads (no limit)	yes on s.pads max 1000µF	yes on PluX max 1000µF	yes on s.pads max 1000µF	yes on s.pads max 1000µF	internal buffer 2000µF/5V AND external: 5V tantals on s.pads	internal energy storage: 2 Supercaps	internal: 3 Supercaps AND external on pins/screw terminals
Speaker Outputs dep.on dec. 8 Ω or 4 Ω (2 x 8 Ω in parallel)	1 3 watts / 4 Ω with wires	1 3 watts / 4 Ω on PluX	1 3 watts / 4 Ω on MTC	1 3 watts / 4 Ω on MTC	1 1 watts / 8 Ω with wires	1 1 watts / 8 Ω on PluX	1 1 watts / 8 Ω with wires	1 1 watts / 8 Ω with wires	1 1 watts / 8 Ω on Next18	2 10 watts / 4 Ω on pins/terminals	2 10 watts / 4 Ω on pins/terminals
Energy Storage - connect. 15V - capacitors DIRECTLY to the decoder	-	-	-	-	-	-	-	yes wires or PluX	yes wires	yes wires or PluX	yes wires	-
SUSI - connect. (altern. SUSI, I2C)	-	-	2 alternate use of logic-level	2 alternate use of logic-level	2 alternate use of logic-level	2 alternate use of logic-level	2 alternate use of logic-level	2 alternate use of logic-level	2 alternate use of logic-level	2 alternate use of logic-level	2 alternate use of logic-level
Servo - control wires (complete with 5V supply)	-	-	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (NO, external 5V)	2 alternate use of logic-level (YES, version „V")	2 alternate use of logic-level (NO, external 5V)
Function Outputs incl. 2 x headlights (+ logic-level outputs)	4 all 4 with wires or on plug	6 2 wires or pins 4 on s.pads	6 2 wires or pins 4 on s.pads	4 4 on plug (+ 4 logic-level)	4 2 wires or pins 2 on s.pads or PluX (+ 2 logic-level)	4 2 wires or PluX 2 pads or PluX (+ 4 logic-level)	6 4 wires or PluX 4 s.pads or PluX (+ 2 logic-level)	10(9) 4 wires or PluX (+ 2 logic-level)	6(8) MTC (+ 2(4) logic-level)	10(9) 4 wires or PluX (+ 2 logic-level)	6(8) (+ 2(4) logic-level)
Continuous Current motor+sound+FOs (peak)	0.8 A (1.5 A)	0.7 A (1.5 A)	0.8 A (1.5 A)	0.8 A (1.5 A)	0.8 A (1.5 A)	0.8 A (1.5 A)	1.0 A (,5 A)	1.2 A (2.5 A)	1.2 A (2.5 A)	1.2 A (2.5 A)	1.2 A (2.5 A)
Connections *wires and/or standardized interfaces*	**9 wires** or **PluX**-12	**7 wires** or NEM-**651**	**7 wires** or NEM-**651**	**Next**18	**7 wires**	**7 wires**	**9 wires** or **PluX**-16	**11 wires** or **PluX**-22	**21MTC**	**12 wires** or **PluX**-22	**21MTC**
Dimensions (mm)	25 x 11 x 2	8 x 8 x 2	13 x 9 x 2.5	15 x 9.5 x 2.8	14 x 9 x 2.5	20 x 8.5 x 2.5	20 x 11 x 3.5	22 x 15 x 3.5	20.5x15.5x3.5	26 x 15 x 3.5	20.5x15.5x3.5
MX-Decoders (Non-Sound)	**MX600,** -R, -P12	**MX616,** -R, -F, -N	**MX617,** -R, -F, -N	**MX618N18**	**MX622,** -R, -F, -N	**MX623,** -R, -F, -P16	**MX630,** -R, -F, -P16	**MX633,** -R, -F, -P	**MX634C, D**	**MX635,** -R, -F, -P22	**MX636C, D**	**MX637P22**	**MX638C, D**
	flat decoder	Miniature			Standard H0			High end H0		High power H0, 0		Ecomony high end H0

MX600 | MX616 | MX617 | MX618 | MX622 | MX623 | MX630 | MX633 | MX634 | MX635 | MX636 | MX637 | MX638

DCC | FITS mfx

Every ZIMO decoder is technologically advanced, being ahead of their time. Making a unique difference through advanced features which are realized thought the use of innovative software and hardware that in many cases integrates the use of RailCom. All of this is designed and made inhouse, at ZIMO in Austria, using high quality components, while providing an extra
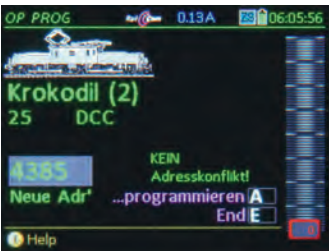
MXULF *Updating and Sound loading device for decoders*

Updating and loading sound onto ZIMO decoders can be done via flash drive or computer.
Alternatively, the SUSI interface can be used to load sound within a few minutes,to test the driving operation and for many other feartures.

HLU *unmatched for 20 years*

Almost from the beginning (1980), the "signal controlled speed influence" (HLU's predecessor) is integrated in all ZIMO decoders and digital systems.
DCC is known to be a communication format from the digital command station to the vehicles; a single command is distributed on the whole layout, to which (only) one decoder reacts due to the loco address sent with the command.
HLU information is always bound to one specified track section, does NOT contain addresses and is valid for all trains on the track section. Usually those are commands to stop the trains or limit the speed; practically without delay (100 times/sec).

	H	Halt		7
5	UH	Zwischenstufe		
L i m i t s	U	Ultralangsam	S t u f e n	
	LU	Zwischenstufe		
	L	Langsam		
	FL	Zwischenstufe		
	F	Volle Fahrt		
	(A	Spannung AUS)		

Die HLU - Geschwindigkeitslimits (einschließlich „Halt" und „Fahrt")

PoM *all over the place*

Standardized PoM allowing the reading and programing of CV's on the main track; Zimo has also implemented the VHDM standard allowing addresses of decoders to be changed on the main track.

EAST-WEST

Since 2018 always in the right directon

RailCom application

Since the time the model railway also works digitally, the driving direction is not track-bound, but dependent on the vehicle (forward means chimney or driver's cab 1 ahead). This is often, but not always, an advantage. Therefore, the ZIMO system with its decoders has the possibility to set the train's direction in a layout-dependent direction: "East" and "West". The driving direction might as well be interpreted as "right" or "left", technically it depends on the polarity of the DCC track signal.
One of the characteristic features is that East-West does not work against, but together with the driving directions forward-backwards. This means:
- driving off in the "right" direction without knowing in which direction the train is placed on the tracks
- to send "both directions" via RailCom to the controller, so the driver always has all the information
- without losing the known handling (change of directions).

Fwd | E | W | Rev

Track-on search *RailCom application* and Rolling stock search *(project)*

The "track-on search" is used to determine the unknown address of one or a few vehicles. The vehicle currently being searched for is temporarily disconnected from the power supply (or placed on the layout again); after the procedure is started, the address and (if available) the name of the vehicle found appears. This is done within seconds .

The Rolling stock search has been included in the RCN-217 standard of the "RailCommunity" manufacturers' association.
The "stock search" covers all decoders found on the track. This is done by a request "to all" to report via RailCom. In this way the system database can be (semi-)automatically supplemented and cleaned up.

Adr. 2044 gefunden
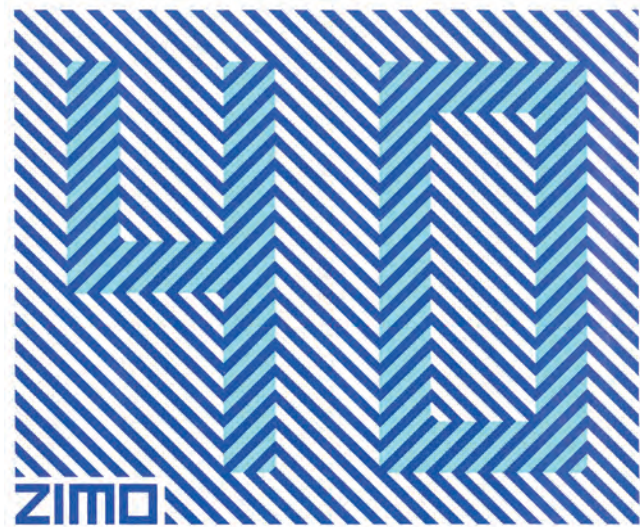Aufgegleist vor 35s
Name: Bay Mallet

ZIMO Systems and decoders 1980 to 2020

Below: The first command station (digital central), the second (!) controllers, the first "vehicle receivers" (later: decoder).

In several generations (4-7 depending on the article group)the ever growing ZIMO development department has created the most comprehensive product range on the market for model railway electronics from 1980 to 2020.
The in-house electronics production, on which ZIMO relies as one of few suppliers, allows the flexible processing of all orders from the model railway industry and from retailers.
in 2020 (already for the fourth time in history) a large part of the machinery of the SMD production line (assembly machine, solder paste printer, AOI system, etc.) has been renewed. ZIMO is now more efficient in several aspects: higher quantities, more indivi-dualization, even lower error rate, progressive miniaturization.

Photo: New 3D AOI at training.

40 years

ZIMO