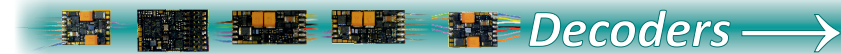


Digital

2021
APRIL edition



170 x 200 x 40 mm

MX10 "big" version



140 x 170 x 40 mm

MX10 Economy

MX33FU

80 x 177 x 40 mm



The System

The ZIMO starter sets with MX33 or MX33FU

Each starter set contains a command station, a cab (controller), a power supply unit and accessories (cables, ...):

START, -FU, -G, -GFU, -EC, -ECFU

The names of these 6 variants differ by the letters at the end ...

..**FU** = The start set contains a wireless cab of type MX33**FU**, otherwise MX33; the basic unit is always equipped with wireless cab.

..**G**.. = The starter set is preferably intended for large scale railways (**G**roßbahn); it contains a power supply unit with **600 Watt** power, which makes full use of an MX10 (otherwise 320 Watt).

..**EC**.. = The starter set contains an economy base unit MX10**EC**; not compatible with ..**G**.

The starter set with the mouse for the waiting time till the MX33



140 x 170 x 40 mm

MX10 Economy

The image shows a ZIMO MX33 remote control. It features a light blue plastic body with several control elements:

- Top Section:** Includes buttons for **(E+) SERV** (red), **(I-) MODE** (red), and a central joystick labeled **RvR** with a **Ruck** label below it. To the right of the joystick is a red button with a **S** and a red button with an **H**.
- Left Column:** A vertical slider labeled **on/off** and **A_y**. Below it is a button labeled **off** and **E_n**.
- Grid of Buttons:**
 - Row 1: **F0** (10/20), **F1** (11/21), **F2** (12/22)
 - Row 2: **F3** (13/23), **F4** (14/24), **F5** (15/25)
 - Row 3: **F6** (16/26), **F7** (17/27), **F8** (18/28)
 - Row 4: **F9** (19/29), **0** (10/29)
- Other Labels:** **West**, **Out**, **(I-) EIN**, **SSP**, **AUS**, **1 EM**, **ABC**, **DEF**, **GHI**, **JKL**, **MNO**, **PQRS**, **TUV**, **WXYZ**, and **MX33** at the bottom left.

MX33 CAD drawing

..EC.. = The starter set contains an economy base unit MX10EC; not compatible with ..G.

***The starter set with the mouse
for the waiting time till the MX33***

As long as the MX33(FU) cab is not available, we recommend a **START(EG)WM**, i.e. a **ZIMO** starter set with a **Roco Z21** **WLAN**maus. The price means that if is purchased mouse is a device at normal cost.

starter set with a **Roco Z21**
 The price means that if
 is purchased mouse is a
 device at
 normal cost

WLANmaus.
 structure
 an MX33(FU)
 later, the
 useful second
 half the

StE

Stationary equipment module

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

The StEin



The combination of **continuous and intermittent ATPs** allows a high stopping point accuracy, saves costs and brings the ZIMO system nearer to ETCS (European Train Control System).

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.

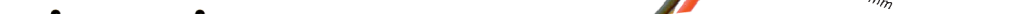
[illegible]

for all types of switch drives and feedback signals, two-way, three-

StEin 88V

The StEin main board

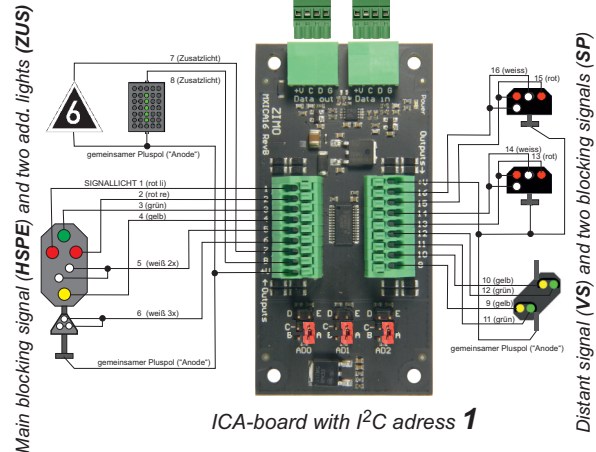
for 8 track sections, 8 switch drives, 16 switch inputs, 2 loudspeakers, I²C bus.



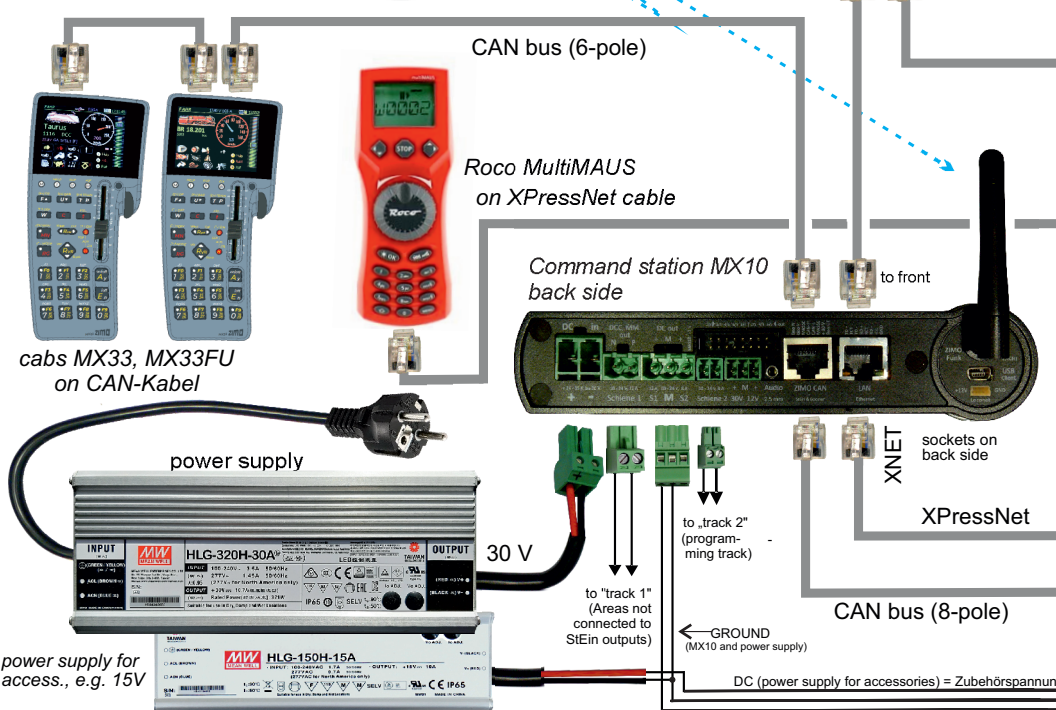
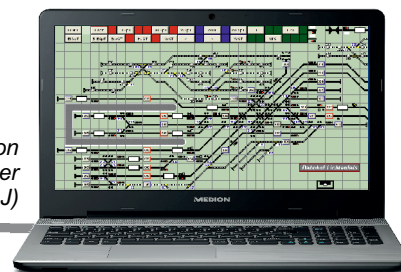
StEin = SWITCH MODULE
for all types of switch drives and feedback signals, two-way, three-way, comprehensive parameterisation.

StEin = SOUND MODULE
for station announcements and all stationary railway noise.

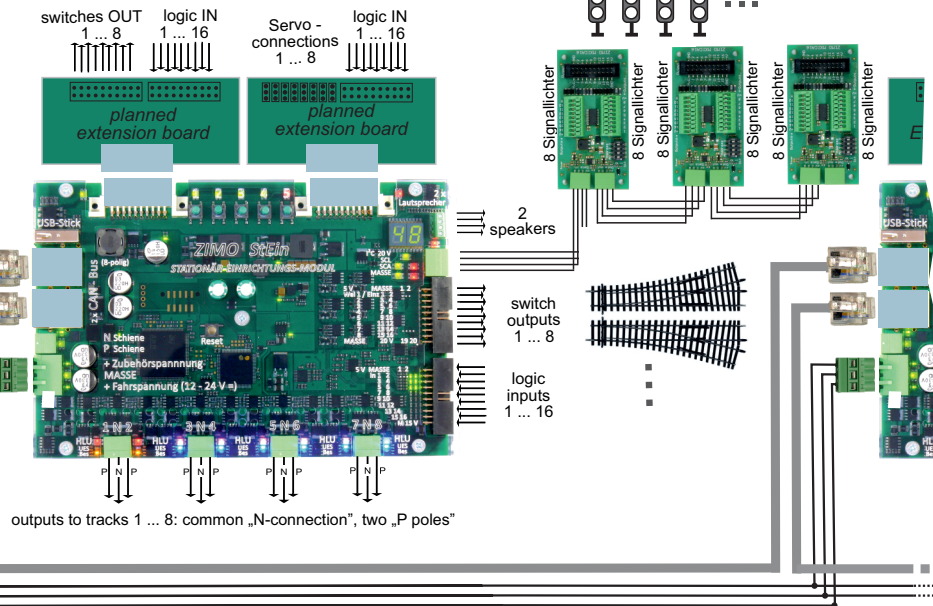
Object-oriented approach and tabular recording of the configuration.



Interlocking on the computer (ESTWGJ)



Stationary Equipment-Module StEin and ICA-boards



The Decoders

MS SOUND DECODERS

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

The *most powerful microelectronics* found in the model railway world are built into these decoders: "state-of-the-art" 32-bit ARM processors with DSP characteristics (80 MHz, 100 DMIPS).

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.

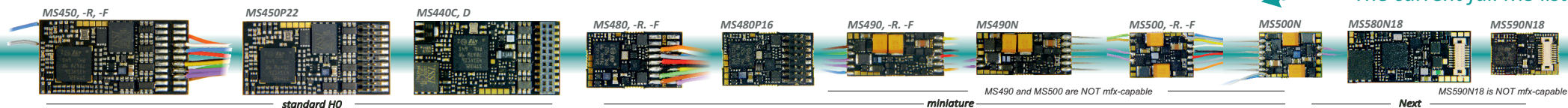
22 kHz Sample rate by default, but also (defined by the sound project) sound channels of **11 kHz** for simpler sounds (e.g. station announcements) and **44 kHz** for sounds of maximum hi-fi quality.

128 Mbit sound memory means 360 sec playback time of high quality (16 bits / 22 kHz); at economical memory usage (8 bits / 11kHz) up to 1440 seconds are possible (neglecting the overhead).

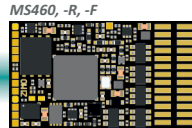
16 sound channels can be played back simultaneously and adjusted individually, and can also be distributed to two speakers in "stereo decoders" (especially, but not limited to, large-scale decoders).

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. (planned at the time of printing).

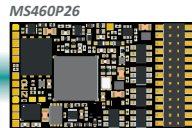
Note! Even "old" (not converted) 8 bit sound projects do sound better with the MS hardware!

[illegible]

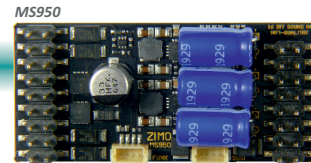
Servo - connect (complete with 5V supply)	2 of logic-level (NO, ext. 5V needed)	2 of logic-level (NO, ext. 5V needed)	2 of logic-level (NO, ext. 5V needed)	2 of logic-level (NO, ext. 5V needed)	2 of logic-level (NO, external 5V)	2 of logic-level (NO, external 5V)	2 of logic-level (NO, external 5V)	2 of logic-level (NO, external 5V)	2 of logic-level (NO, external 5V)	2 of logic-level (NO, ext. 5V needed)	2 of logic-level (NO, ext. 5V needed)
SUSI - connection alternatively SUSI, I2C, sound loading	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Switching Inputs for cam sensores, 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 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
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 max 1000µF	yes on PluX max 1000µF	yes on s.pads max 1000µF	yes on s.pads max 1000µF	yes on s.pads max 1000µF	yes on s.pads max 1000µF	internal buffer 940 µF/5 V AND/OR external tantals or Goldcaps on s.pads	no
Speaker Outputs dep.on dec. 8Ω or 4 Ω (2 x 8Ω in parallel)	1 3 watt / 4 Ω with wires	1 3 watt / 4 Ω on PluX	1 3 watt / 4 Ω on MTC	1 1 watt / 8 Ω with wires	1 1 watt / 8 Ω on PluX	1 1 watt / 8 Ω with wires	1 1 watt / 8 Ω with wires	1 1 watt / 8 Ω with wires	1 1 watt / 8 Ω with wires	1 1 watt / 8 Ω on Next18	1 1 watt / 8 Ω on Next18



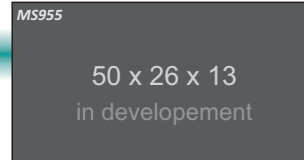
MS460, -R, -F



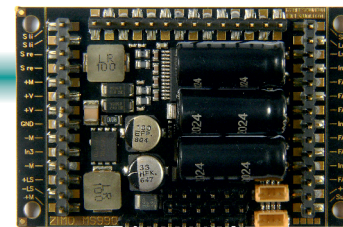
MS460P26



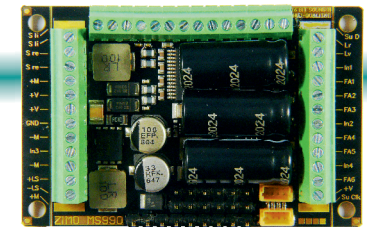
MS950



MS955
50 x 26 x 13
in development



MS990L
(63 pins)



MS990K
(38 screw terminals + 21 Stifte)

MS decoders ("stereo") for small and large scales

Dimensions (mm)	30 x 17 x 4.2	30 x 17 x 4.2
Connections	15 wires NEM-652, NEM-651 MS460 like MS450	PluX-26 *) PluX-22
Continuous Current motor+sound+FOs (peak)	1.6 A (2.5 A)	1.6 A (2.5 A)
Speaker Outputs dep.on dec. 8Ω or 4 Ω (2 x 8Ω in parallel)	2x 3 watts / 4 Ω with wires	2x 3 watts / 4 Ω on PluX

MS950	Loco board included	MS955	Loco board included
50 x 23 x 13	11 function outputs + 4 logic level outputs	50 x 26 x 13	11 function outputs + 4 logic level outputs
4 A (10 A)	2 servo control lines + 2 alternate use of logic level	4 A (10 A)	2 servo control lines + 2 alternate use of logic level
2x 3 watts / 4 Ω		2x 5 watts / 4 Ω	2 smoke generator pins

MS990L (63 pins)	Loco board available	MS990K (38 screw terminals + 21 Stifte)
50 x 40 x 13	15 function outputs + 2 fan outputs	50 x 40 x 13
6 A (10 A)	6 Servo control lines (3-pole)	all data like MS950L
2x 10 watts / 4 Ω		

StayAlive!

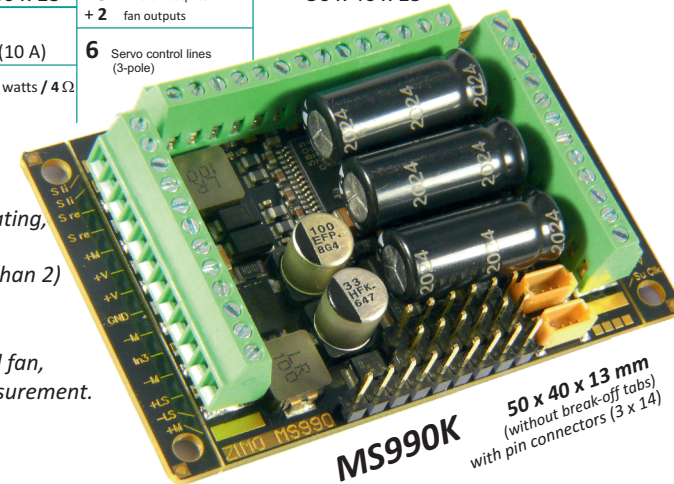
"StayAlive" - a ZIMO focus: NO bulky powerpacks, but *space-saving, economical, effective solutions:*

Mini Goldcaps (modules of 6) for direct connection for H0 decoders, (2 or 3 in series) via StayAlive controllers for miniature decoders, onboard capacities in Next decoders up to large scale (all types).



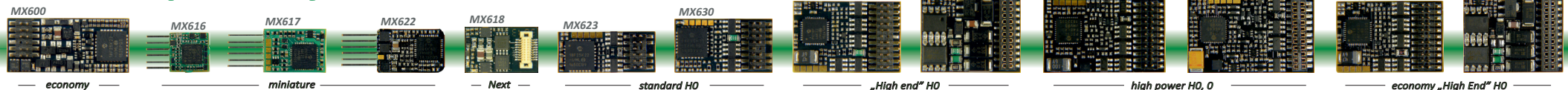
The flagship of decoder technology

Synchronous rectifier for high performance without overheating, *low voltages* (5 V, 10 V and variable) for functions, *3 StayAlive supercaps* onboard (*these 3 are more effective than 2* *loudspeaker outputs* (stereo and timbre filter), *2 SUSI-interfaces* (also as I²C, sound-load-connector, etc.), *2 smoke generators*, each with its own heating element and fan, *Gyro and acceleration sensor* for inclination and curve measurement.



MS990K
50 x 40 x 13 mm
(without break-off tabs)
with pin connectors (3 x 14)

MX (NON SOUND) DECODERS

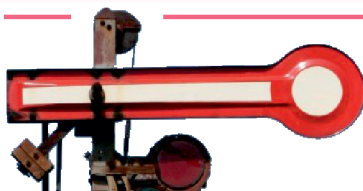


MX decoders (non sound)	MX600, -R, -P12	MX616, -R, -F, -N	MX617, -R, -F, -N	MX618N18	MX622, -R, -F, -N	MX623, -R, -F, -P16	MX630, -R, -F, -P16	MX633, -R, -F, -P22	MX634c,D	MX635, -R, -F, -P22	MX636c,D	MX637P22	MX638c,D
Dimensions (mm)	25 x 11 x 2	8 x 8 x 2.4	13 x 9 x 2.5	15 x 9.5 x 2.8	14 x 9 x 2.5	20 x 8.5 x 2.5	20 x 11 x 3.5	22 x 15 x 3.5	22 x 15 x 3.5	26 x 15 x 3.5	26 x 15 x 3.5	22 x 15 x 3.5	20.5 x 15.5 x 3.5
Connections wires and/or standardized interfaces	9 wires or PluX-12	7 wires or NEM-651	7 wires or NEM-651	Next18	7 wires or NEM-651	7 wires or PluX-12	9 wires or PluX-16	11 wires or PluX-22	21MTC	12 wires or PluX-22	21MTC	9 wires or PluX-22	21 MTC

	-R, -P12	-R, -F, -N	-R, -F, -N	-R, -F, -N	-R, -F, -N	-R, -F, -N	-R, -F, -N	-R, -F, -P16	-R, -F, -P16	-R, -F, -P22	-R, -F, -P22	-R, -F, -P22	-R, -F, -P22
Dimensions (mm)	25 x 11 x 2	8 x 8 x 2.4	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	22 x 15 x 3.5	26 x 15 x 3.5	26 x 15 x 3.5	22 x 15 x 3.5	20.5 x 15.5 x 3.5
Connections <i>wires and/or standardized interfaces</i>	9 wires or PluX-12	7 wires or NEM-651	7 wires or NEM-651	Next18	7 wires or NEM-651	7 wires or PluX-12	9 wires or PluX-16	11 wires or PluX-22	21MTC	12 wires or PluX-22	21MTC	9 wires or PluX-22	21 MTC
Continuous Current	0.8 A	0.7 A	0.8 A	0.8 A	0.8 A	0.8 A	1.0 A	1.2 A	1.2 A	1.2 A	1.2 A	1.2 A	1.2 A
Function Outputs <i>incl. 2 x headlights (+ logic-level outputs)</i>	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 (+ 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)	10(9) PluX (+ 2 logic-level)	6(8) (+ 2(4) 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 (YES, version „V“)	2 alternate use of logic-level (NO, external 5V)
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	2 alternate use of logic-level
Energy Storage - connect. 15V - capacitors DIRECTLY to the decoder	-	-	-	-	-	-	-	yes via wires or PluX	yes via MTC	yes via wires or PluX	yes via MTC	-	-

SPECIALITIES

HLU unmatched for 20 years



H	Halt	7
5	UH intermediate	S
U	Ultraslow	t
LU	intermediate	u
L	Slow	f
FL	intermediate	u
F	Full speed	e
(A)	voltage OFF	n

The HLU speed limits
(including „Halt“ und „Full speed“)

From the beginning (1980), "HLU", initially under the designation "signal controlled speed influence", has been a fixed component of ZIMO digital systems and decoders.

While DCC, according to the standard, sends **addressed commands** to each individual vehicle, individual **separate track sections** can be given **HLU information** at the same time. These are not addressed, but are location-dependent for decoders located there.

In this way, trains receive HLU instructions to **stop before red signals** or **speed limits**.

HLU information is generated by the track section outputs of a **"StEin module"** (see front of this sheet), usually under the control of a computer controller (interlocking software).

on-track search

It's all PoM

For some time now, it has been the general standard to read and program CVs on the main track; however, the classic programming track output is still used for addressing decoders.

ZIMO has developed the **re-addressing on the main track** (i.e. in "Operational Mode", PoM).

The "on-track search" is used to **find the unknown address(es)** of one or a few vehicles. The vehicle currently being searched for is briefly de-energised:



EW right direction

That's only with ZIMO:

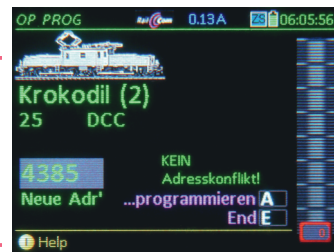
Features that are unique, or ahead of their time, make a difference to "normal" products. Much is based on sophisticated software. The hardware contributes its share: not geared to lowest cost, but to high quality and sustainability.

Since the model railway runs digitally, the direction selected on the controller is not track-related but locomotive-related (Forward = "cab 1 ahead"). This is often, but not always, advantageous. ZIMO offers the possibility to drive specifically in a **given layout-related direction**, called "East" and "West", if required. Technically, this is the phasing of the DCC track signal.

The characteristic feature is: the entire directional logic is NOT simply switched over, but "forward-backward" and "east-west" work together:

- always correct start-up without knowing the rerail direction
- display the complete directional information via RailCom on the controller ("Forward-Backward" and "East-West"), without loss of the usual handling.

innovative RailCom applications!



its address and (if already present) name appear after a few seconds.

MXULFA

The decoder update and sound loading device loads the new software or sound project either from the USB stick or from the computer, via the track or (the sound) via the SUSI interface (especially fast).

