INSTRUCTION MANUAL MX32, MX32FU

Tethered controller

Radio controller

EDITION

2010 11 30
2010 12 18
2011 01 12
2011 03 15
2011 06 20
SW-Version 01.07 --- 2011 08 05
2012 02 15
SW-Version 01.12 --- 2012 07 30
2014 02 10
SW-Version 01.13 (Command station: MX10) --- 2014 07 15
SW-Version 01.13 (Command station: MX1and MX10) --- 2014 07 27
SW-Version 01.13 (Command station: MX1 and MX10) --- 2014 08 18
SW-Version 01.14 --- 2014 11 03
SW-Version 01.15.1120 --- 2014 11 28
2015 02 15
2015 03 23
SW-Version 01.15.1121 --- 2015 04 08
SW-Version 01.16.0008 (Command station: MX10 and Z21) --- 2015 04 24
SW-Version 01.16.0014 (Command station MX10) --- 2015 05 11
SW-Version 01.16.0033 (Command station MX10) --- 2015 05 27
2015 06 10
2015 06 25
2015 07 08
2015 07 21
SW-Version 01.17.0000 --- 2015 08 26
2015 09 07
2015 09 29
2015 10 13
2015 10 18
2016 02 20
SW-Version 01.19.0001 --- 2016 04 22
SW-Version 01.20.0001 --- 2016 09 22
SW-Version 01.20.0100 --- 2016 12 22
SW-Version 01.20.0150 --- 2017 03 10
2017 05 26
SW-Version 01.21.0001 --- 2017 07 25
SW-Version 01.21.0500 --- 2017 10 12
2017 12 31
SW-Version 01.22.0001 --- 2018 01 29
2018 04 13
2018 05 03
2018 07 08
SW-Version 01.24.0001 --- 2018 07 30
2018 08 24
2018 09 03
2018 11 07
SW-Version ---2019 03 25

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Betriebsanleitung MX32 Änderungsprotokoll ab 2019

2019 03 06
CONFIG*:* Funk-Zentrale, Home-System | ***CONFIG***: Dieses Pult, Clear Data, Das Löschen von Fahrzeug-Bildern |
FAHR-TRAKTIONSBETRIEB: Einrichten des Traktionsbetriebs

2019 05 05
WEI**:** Neufassung des Kapitels

2019 07 26
ADR … FUMZ, TACHO, … : Neufassung des Kapitels
OP PROG: diverse Korrekturen und neue Bilder in den Unterkapiteln OP PROG – A-Taste und OP PROG – ↑ + *A-Taste*
FAHR EIN: Hinweis auf A-Taste zum Aktivieren (unter F-Taste)

2019 08 27
IV *kleine Ergänzungen*
STEIN LISTE *kHLU und Ost-West-Einstellung – stark geändert*

2019 10 15
Ost-West-Richtung: Shift-Ri beim ersten Mal keine Ri-Änd.

2019 11 22
Traktionsbetrieb: Neufassung

2019 11 25
Betriebszustand WEI: Durch Muster-Schalten …

2019 11 27
Betriebszustand FAHR; überarbeite

2019 12 05
Betriebszustand WEI: Musterschalten in eingeblendeter *ZUB LISTE zum Einsetzen von Parametern in Panel-Felder*
IV Seiten korrigiert

2019 12 17
Traktionen: Traktionen in Zentrale, und Korr. in Kapitel „Traktionen"

2020 03 15
Betriebszustand „Einschalten...." Ergänzung über Home-System"
CONFIG – Home System

2020 05 01
Betriebszustand WEI: Ergänzung WEI DEF zum halbautom. Einsetzen von Signalen aus StEin, die Korr. im ganzen Kapitel

2020 05 08
Ergänzung Shift-U zur Übernahme ohne Fenster

2020 05 12
Kap 9 E+0: Shift-U, Shift-F; Kap 19: ZUB LISTE: TP > OP PROG; Kap 12 GUI Hinweis auf Home System, Kap 21 Funkbetrieb: Funkdiagnose-Info,
Kap 13 FAHR: Beschreibung Fortschrittsbalken des Backgroundreaders, Quality of Service, Beschreibung der Bildschirmdarstellungen.

2020 05 30:
Kapitel CONFIG, FAHR, … : Bilder nachtragen/ersetzen, kleine Text-Korr.

2020 06 01
Kapitel „FAHR – TRAKTIONSBETRIEB", neuer Abschnitt „Traktionen in die Systemzentrale verschieben"

2020 10 28
Kapitel „ADR … FUMZ, TACHO, ...), Neuer HINWEIS: „GUI-Design am Computer mit ZCS", und
Kapilte „GUI .. Speicherung im MX10 .."GUI vom Computer laden" 3 Bilder modifiziert

2020 12 22
Kapitel „Betriebszustand WEI", Neuer Text und Korrekturen im letzten Abschnitt (über „WEI DEF zum halbautomatischen Einsetzen …)

2021 01 14
Korr im Betriebszustand WEI, Programmierung von Weichenstraßen

2021 06 24, 2021 07 23
Ergänzung von Fotos im Betriebszustand WEI, ZUB LISTE, StEin LISTE

Notes to software versions and instruction manual

SOFTWARE and SOFTWARE UPDATES:

Information about the **current software version** is available on the ZIMO website www.zimo.at as free download from the “**Update & Sound**” (“Update – System”) page of the same website.

Information about the **currently installed software version** of the MX32 (version number and date) is shown on the first ***CONFIG*** page, accessible with **E-Key + 0** (Overview & HW/SW info).

THE SCOPE of this MANUAL:

The MX32 controller is part of the ZIMO digital system, consisting of the (other) important components MX10 or MX10EC and the “StEin“ modules.

However, the MX32 can also be used with “older” ZIMO DCC systems (various models of the command station MX1, “old” accessory modules MX8 and track section modules MX9) as well as with the Roco Z21 command station, although certain limitations apply (e.g. RailCom is not available if a MX1 or MX9 is used).

ACCURACY of this MANUAL:

The screenshots and the functions described in this manual may differ from the ones in the current software version, because improvements and enhancements are ongoing.

General information:

- This manual reflects (matches) the product- and software version at delivery. The device may show further features after an update. New versions of this manual are published on the ZIMO website www.zimo.at .
- ZIMO devices should not be operated in extreme surroundings (heat, humidity). The air circulation into and out of the device should not be restricted (i.e. by covering).
- The cable connection should not be squeezed or put under physical tension or twisted. In order to have a faultless power- and data transmission, make sure that all connections have a solid fit.
- The device should not sty under voltage unattended. The power supply unit(s) must be disconnected from the mains using a switchable socket strip or pulling the plug(s).
- Children under the age of 8 years must be under supervision of an adult when operating the device.
- Improper use or opening of the device without consulting ZIMO may lead to danger or loss of warranty.

Please visit our website **http://www.zimo.at** for more information about ZIMO products, loco sound files or software from ZIMO partners.

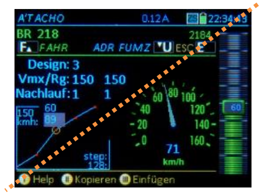
ZIMO ELEKTRONIK GmbH
Schönbrunner Strasse 188
1120 Vienna
Austria

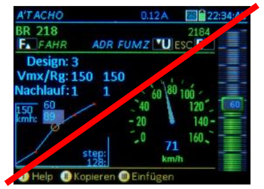
Durchgestrichene und noch nicht vorhandene Display-Fotos in der Anleitung:

Da die Software von ZIMO Produkten so auch von Fahrpulten - oft erweitert und korrigiert wird, müssen oft auch Display-Abbildungen in der Betriebsanleitung ersetzt werden. Diese Fotos stehen jedoch aus organisatorischen Gründen nicht immer rechtzeitig zur Verfügung.

Daher gibt es Kennzeichnungen für Bilder, die nicht dem aktuellen Stand der Anleitung entsprechen.

- Punktiert durchgestrichenes Bild: Bild passt nicht zum Kontext; z.B. innerhalb einer Sequenz von Bildern mit einem anderen Loknamen (weil eben aus verschiedenen Aufnahmeserien stammend).
- Rot durchgestrichenes Bild: veraltete Darstellung
- „Bild wird nachgetragen“: darauf zurückzuführen, dass die Software zum Zeitpunkt des Verfassens dieses Kapitels der Betriebsanleitung noch nicht in der Lage war, das Bild zu erzeugen.

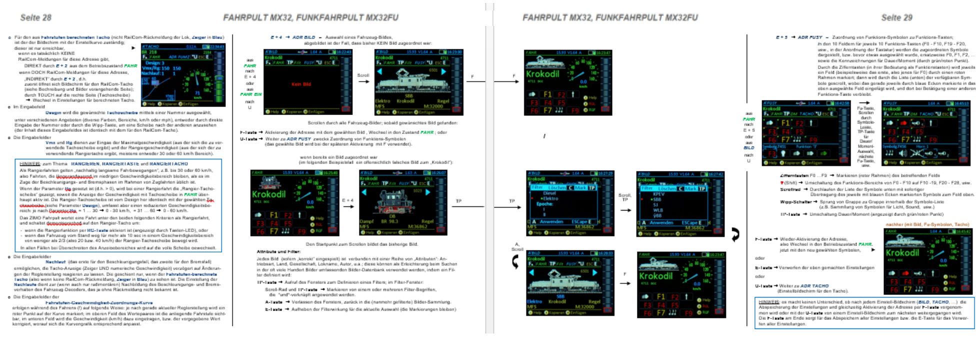


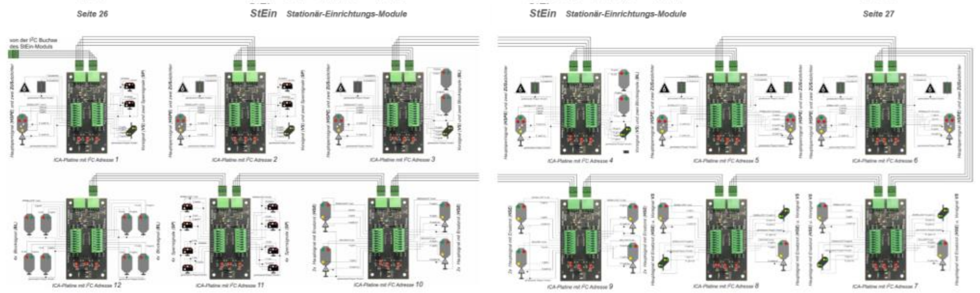


Wichtiger HINWEIS zum DARSTELLEN und AUSDRUCKEN der ZIMO Betriebsanleitungen:

Die ZIMO Betriebsanleitungen sind im A4 Querformat geschrieben; häufig im **Doppelseiten-Design**, d.h. eine linke und eine rechte Seite gehören inhaltlich und optisch zusammen. Die Druckausgabe (bzw. das von www.zimo.at herunterzuladende .pdf-File) sollte daher so betrachtet werden, dass jeweils zwei Folgeseiten nebeneinander liegen (links jene mit geradzahliger Seitennummer rechts jene mit ungeradzahliger); in .pdf-Ansicht dazu unter „**Seitenansicht**“: „**Deckblatt separat anzeigen**“.

Beispiele (aus Betriebsanleitungen für Fahrpult MX32 bzw. Gleisabschnitts-Modul StEin):

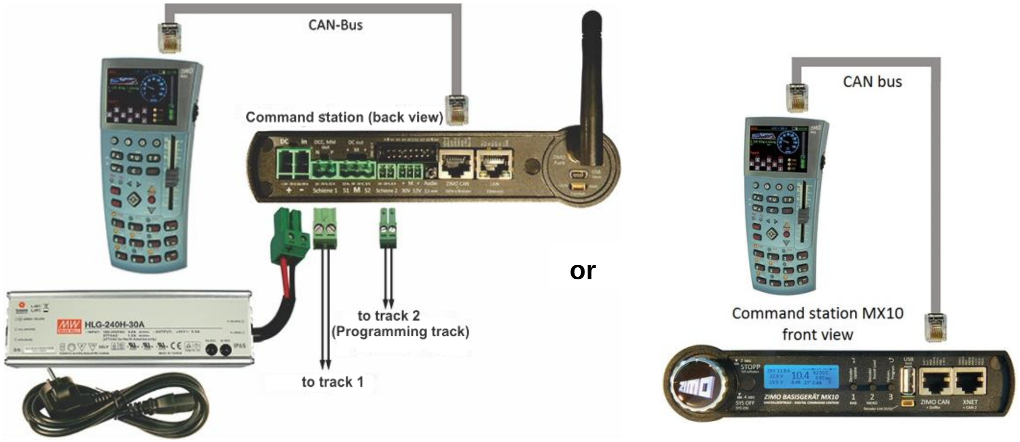

Seite 28
FAHRPULT MX32, FUNKFAHRPULT MX32FU
FAHRPULT MX32, FUNKFAHRPULT MX32FU
Seite 29


Seite 26
StEin Stationär-Einrichtungs-Module
StEin Stationär-Einrichtungs-Module
Seite 27

The usual system layout

The MX32 controller, as well as the radio version MX32FU are the most important input devices within the ZIMO DCC system. They are used together with the current **command station MX10,** but also (with reduced functionality) with its predecessors **MX1, MX1HS, MX1EC.**

The minimum configuration of a ZIMO digital system with MX10 & MX32 is as follows:



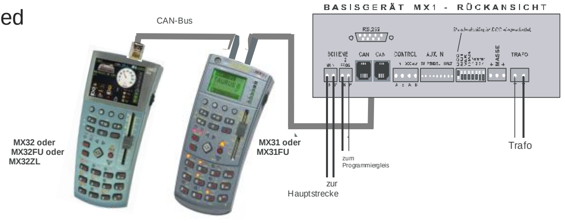
The MX32 and MX32FU (in tethered mode) can be connected to either the front or the rear CAN socket of the MX10 with a **6-conductor CAN cable**, such as our **6POL1M** (1 meter in length). Since these two CAN sockets are internally connected to the **ZIMO CAN 1** bus of the MX10, it is possible to connect controllers to the front and rear bus simultaneously. For example, to permanently connect tethered MX32 controllers to the rear socket, while the front socket is used to recharge the battery of a MX32FU radio controller when needed.
More connections (spec. of "Track 2" of the MX10) may be found in the MX10 Command station manual.

The system layout with the "old" command stations MX1, MX1HS, MX1EC:

The MX32 cab is suitable for operation with the command station MX1 (only with SW Version 3.06). Simply plug the MX32 in to the CAN bus socket of the MX1. The MX32 when connected to a MX1 starts in the "MX1 mode" ("MX1" in the communications dot) and will therefore have some limitations such as: 12 functions, no RailCom, no OP PROG acknowledgements, different stop functions (see chapter "The stop option in connection with the old MX1 command station") and F8-F12 are sent less frequently over the CAN bus for long loco addresses.

The MX32FU can only be used as a tethered cab because there is no radio processor integrated in the MX1.

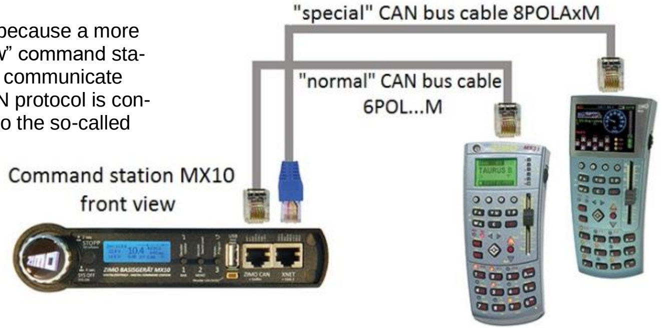
The shunting key of the MX32 is inactive with this set-up.



System layout with MX10 & MX32 & "old" controller types MX31, MXFU:

The following special connection scheme must be adhered to:

- The **"old"** devices (MX31…) must be connected with a 6-conductor CAN bus cable to one of the two ZIMO CAN sockets (**ZIMO CAN 1**, either front or back of the MX10).
- The **"new"** devices (MX32…) must be connected to the front **XNET socket (!)** with a CAN bus **adapter cable** (8-pin plug on the MX10's side, 6-pin plug on the controller's side; i.e. **8POLA1M).** This special cable connects the **ZIMO CAN 2** (which is available at the XNET socket) with the CAN socket of the controller.



The use of both CAN buses is necessary because a more modern, faster protocol is used in the "new" command station (MX10), which the old devices cannot communicate with. If a device operating with the old CAN protocol is connected, the MX10 automatically switches to the so-called "MX1 mode".

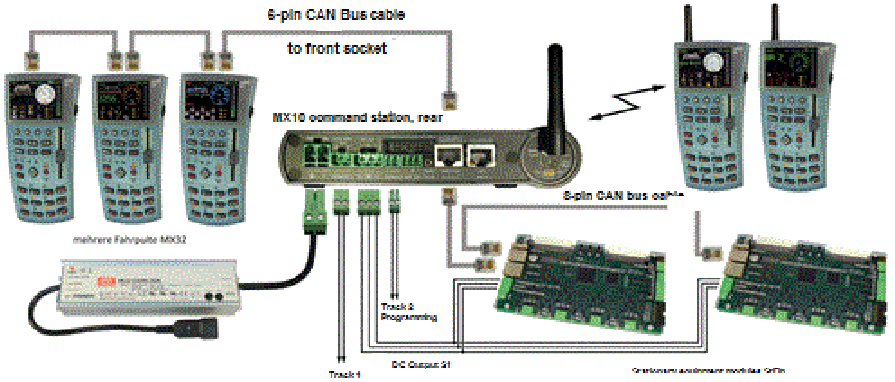
In order to use all new functions of the MX32 without limitations (i.e. RailCom), it must be connected to the ZIMO CAN2 (XNET socket). There are no such limitations when operating the MX32 as radio controller.

What looks like an "illogical separation" (the "old" devices on the ZIMO CAN 1 instead of the new), is found in the necessity of supplying the old controllers with about 30 V (which is only available at the "ZIMO CAN" socket), while the new devices (MX32) operate with 12 V (which is available at the XNET socket). If a MX32 is to be moved from CAN1 to CAN2 it must be turned off before reconnecting!

This connection scheme is also valid when MX7, MX8 and/or MX9 modules are to be connected. These modules must be connected, like a MX31 controller, to the "normal" ZIMO CAN 1 socket of the MX10 and the MX32 controllers to the CAN 2 at the XNET socket as described above.

A more extensive layout configuration with "new" devices exclusively:

The MX32FU radio controller can be operated tethered or in **radio mode.** In contrast to earlier ZIMO systems, the MX10 command station has a radio module built-in and therefore DOES NOT require an external module.



Notes to CAN bus wiring:

The MX32 and MX32FU (as well as all previous types from MX2 to MX31) have two identical CAN bus sockets, which are wired internally in parallel.

These sockets accept **6-pin plug CAN bus cables**, coming directly from the command station MX10, but can also be connected to an empty socket of a StEin module. The cable contains the power supply AS WELL AS the communication wires, and thereby connects all controllers in the system in parallel; usually by connecting the first controller to the command station (MX1...MX10), from the first controller to the second controller and so on.

ATTENTION: The “CAN bus“ is not just used by ZIMO, but meanwhile also by other DCC manufacturers; the CAN bus of the **Roco command station “Z21”,** for example, is in fact compatible and therefore suitable to connect a MX32 cab. Otherwise, they are independent and incompatible CAN bus implementations.

CAN bus cables 6-conductor and 8-conductor (**6POLxM, 8POLxM** as well as **CAN bus adapter cables 8POLAxM** (from 8 – 6-pin)) can be ordered in standard and custom length from ZIMO (see Product- and Pricelist).

The 6-pin CAN bus cables can also be homemade, the required material (6-conductor flat cable, plugs (50 per package)) and assembly pliers are also available from ZIMO. 8-pin CAN bus cables are exactly the same as conventional ethernet cables, which can therefore be used as well.

The CAN bus is designed to be part of a linear network, using a cable with a defined wave impedance and each with a terminating resistor at both ends, which would allow for a cable length of up to 1km. However, in practice different topologies of tree, star and linear structures are often mixed and can lead to losses. To ensure optimum data transmission and speed, such extreme cable lengths are not recommended.

There are absolutely **no restrictions** with a **total cable length of up to 30 yd.** (the sum of all 6-pin or 8-pin CAN bus cables); branches can be freely incorporated; this cable length can be extended if one or more termination resistors are used.

However, the CAN bus can also operate at higher bit-rates when needed, up to 1 Mbit / sec (instead of the 125 Kbit / sec in normal mode). If this is the case (i.e. for image or audio file transfer), and the CAN bus network exceeds the maximum length by a few yards, stricter wiring guidelines must be adhered to.

Please note that the total cable length is also important due to the current supply to the controllers: as a rule of thumb, there should be no more than 2 controllers at the end of a 50-yard cable, no more than 5 controllers at the end of a 20-yard cable and so on.

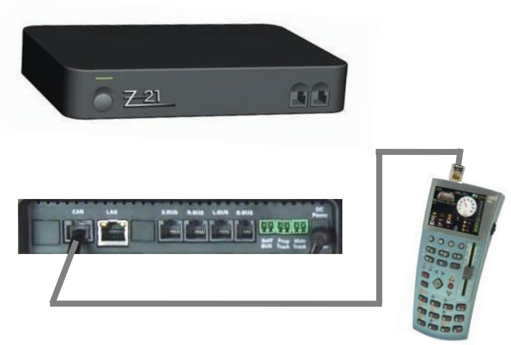
NOTE: Combining the "old command station" MX1 with MX32: the data for the function keys higher than F8 has a low priority in the CAN transmission cycle, which can therefore lead to delays.

Notes regarding radio operation:

Before a radio controller MX32FU can communicate with a command station MX10 via radio, it must “register itself” with the system. This happens when the radio controller is connected once with a CAN bus cable to the running MX10. On this occasion a logical connection is made by transferring a system code, which is permanently retained until a new cable connection is established with another MX10. Also see chapter “The Special Features in Radio Mode”.

The radio range can be improved by changing the supplied standard antennas (on the command station MX10 and the MX32FU) against antennas with higher gain. However, this is only practical for the command station since it is usually placed at a fixed location, whereby the radiating characteristics of the antenna can be optimally utilized and the extra length of the antenna is not an issue. Using a "large" antenna at the MX10 and "small" antennas on the MX32FUs is permitted!

Connecting a MX32 to a ROCO Z21 command station:



A maximum of **3** ZIMO MX32 controllers or 1 MX32FU *) radio controller can be connected to a **Roco Z21 command station** using a 6-conductor CAN cable.

*) The radio controller can only be operated tethered because the Z21 is not equipped with a radio module. Also, due to the larger batteries in the MX32FU, more power may be required from the Z21 compared to a non-radio controller.

This limitation is caused by the available power of the Z21; feeding power from an external power supply to the CAN bus cable (min. 12 V, about 200 mA per controller) eliminates this short coming.

The current consumption of the MX32 and MX32FU is also higher during a software update via flash drive, and therefore connecting one controller should be the limit.

There are hardly any functional limits with the MX32 when connected to a Z21 command station. However, reading and writing CVs (in OP PROG or SERV PREOG) is currently not transmitted via the CAN bus.

Technical Data

Tethered controller MX32, Radio controller MX32FU

Current consumption (with 20-30 V at the CAN bus)..….......70 mA to (while recharging battery) 300 mA
Battery in tethered MX32. ………………………………….…………………………………….. 100 mAh
Battery in radio MX32FU..…………….……………………………………………………………. 2200 mAh
Battery run-time in tethered MX32..……..……...………………………..15 min
Battery run-time in radio MX32FU.. ….…………………………………………………….………….@ 5h
Dimensions Wfront – W_{rear} x H_{front} – H_{rear} x L.. …… 160 x 70 x 20 - 40 mm
Weight MX32. .... 180g
Weight MX32FU.. 240g

RailCom is a registered trademark of Lenz Elektronik GmbH

The MX32 controller in typical LOCO - Display

QoS-Symbol ****)

Display header
Current operating mode, here ***LOCO;***
Voltage & current on the track
"Communications dot" *) for monitoring the data traffic with the command station;
RailCom logo **), when receiving data; Battery status; Clock and fast clock.

Loco Picture
if available, change size by **tapping** on the image.

Loco Name, Address, Data Format
if available; ***tap*** to increase size.

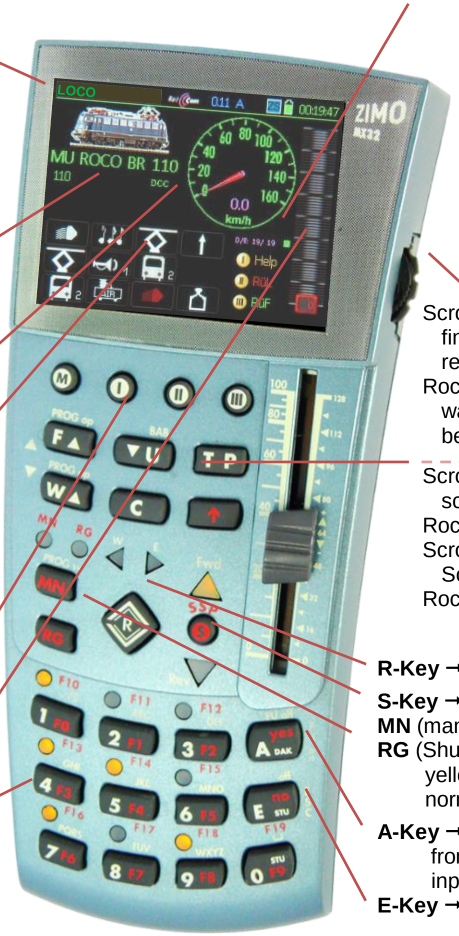
Speedo
shown here with actual speed derived from RailCom (magenta needle) - or derived from speed steps (blue needle);
Tap to switch to small digital speedo (in exchange for a big loco picture)

Function key icons
shown in the numeric key pad arrangement describe their current function and can be operated by the actual keys or through the touch screen. The picture shows the display in the "Black style" (= default style).

Softkeys M (= Menu), **I, II, II**
current meaning above in the display.

Speed step indicator
represents the speed slider and indicates the current speed step, loco take-over state, speed influence and more.

Number and Function Key Pad,
also used for text input



Scrolling wheel in ***LOCO*** – mode for
fine speed control (+/- 10 steps), or as a regulator for assigned parameters (i.e. volume control).
Rocker switch (above the scrolling wheel), for an alternative way to switch to the next or previous address or switching between assigned parameters.

Scrolling wheel in ***LOCO*** mode with visible ***LoR*** for scrolling among the address lines in the ***LoR***,
Rocker switch for switching the display level.
Scrolling wheel during programing ***SERV PROG***, ***OP PROG***
Scrolls among lines in the CV table,
Rocker switch to increment/decrement a value.

R-Key ➝ Direction
S-Key ➝ Stop, BCS, track power OFF
MN (manual) red flashing: MAN active
RG (Shunting,
yellow: Half or 1/3 or normal speed)

A-Key ➝ Select, Confirm,
from ***LOCO*** to address input page ***LOCO IN***
E-Key ➝ End, ESCape,
E-Display

The "small" keypad
F-Key ➝ switches from the address input page ***LOCO IN*** to the operating mode ***LOCO***, or
Scrolling forward among vehicle addresses within ***LOCO***.
U-Key ➝ Scrolling backwards among addresses within ***LOCO***, or takeover of a vehicle address from another controller.
TP- Key ➝ Switching between consist locos, or adding or removing locos from a consist.
W- Key ➝ Switching in and out of the operating mode ***SWI***
C- Key (Clear) ➝ Delete vehicles from the ***LoR*** and more.

*) The **"Communications dot"** indicates:

1) how quickly the command station reacts to requests from the controller by lighting up the BLUE SQUARE when, for example, a function key is pressed, and turning it off again when a confirmation from the command station is received. The communications dot therefore flashes only briefly; a prolonged illumination indicates a slow transmission (overloaded CAN bus, electrically limited or a poor radio link). A continuously lit dot means that the controller commands were not executed by the command station.
2) when communication errors occur: the EMPTY SQUARE indicates by brief illumination single disturbed transmission processes (which are corrected automatically); continuous illumination means loss of connection.

) The **RailCom Logo in the display header indicates the following:
RailCom messages are sent by the decoder to the command station, where they are processed and passed on to the controller. The flashing rate indicates the percentage of answered DCC data packets:

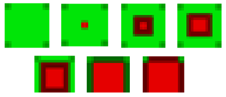
1:10 (i.e. the RailCom logo flashes briefly) = 1 to 5 % of the sent DCC packets were answered.
1:5 (i.e. the RailCom logo flashes a bit faster) = > 5 % to10 %

1:3 = > 10 % to 20 %	3:3 = > 20 % to 50 %	
3:1 = > 50 % to 80 %	5:1 = > 80 % to 90 %	permanent = > 90 %

RailCom is a registered trademark of Lenz Elektronik GmbH

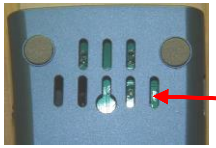
***) **DCC & RailCom statistics: Number of sent DCC packets of this address vs. RailCom responses to these packets - indicator for outgoing reception and response quality.**
AND
Progress bar of the CV background reader (The CVs of the decoder with this address are automatically read in the background to be available without further waiting time if needed (e.g. for configuration operations like "Swiss Mapping")).

****) The **"Quality of Service"** symbol shows the quality of the messages received from the decoder via RailCom. This is a percentage indicator of how many DCC packets arrived without damage from the decoder. All packets are used in this equation, not just the active address – thereby, obtaining a fairly meaningful value as about 80 or 90 events within one second are used as basis.


"Qualtiy of Service" Indicators

Important: Pressing the A-key for 10sec ➝ MX32 RESET

This reset option is sometimes handy, should the controller freeze due to software bugs, because the built-in battery prevents a hard-reset (small battery in non-radio controllers for about 10 min., large battery in the radio controller for about 5 hours) when the CAN bus is briefly disconnected from the controller (unless the battery is depleted).



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MX32 controllers produced until mid-2014, which don't offer a reset option with the A-key, can be reset by bridging the two solder pads through the slot on the right at the back side of the cab, AFTER the CAN bus cable is disconnected.

1. The MX32 HELP-System

Softkey I → is reserved for calling up the help screen in most operating modes. If this Softkey is pressed, it opens the proper help screen for the current situation.

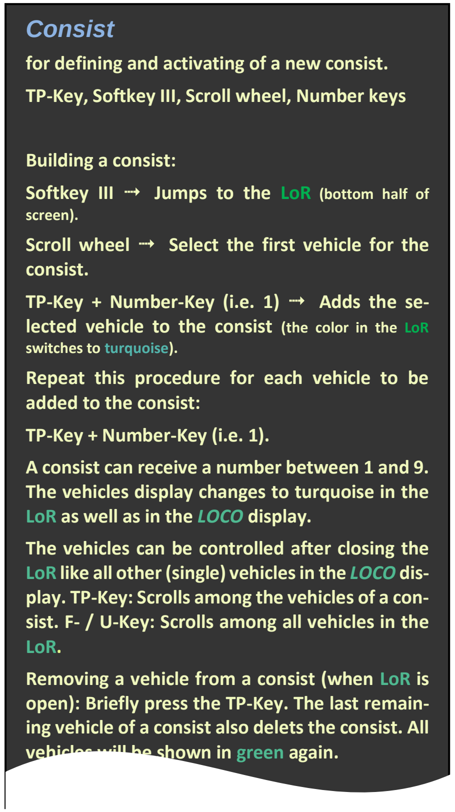
Each displayed help file is scrollable, if there is more content than the screen can hold. The controller remains operational in driving and switching modes (***LOCO*** and ***SWI***) while the help file is displayed; but not in the programming modes, which would make little sense without the programming screen present.

Softkey I → closes the help screen and returns to the previous operating mode.
Softkey II, III → in some cases these Softkeys are used to switch directly to other help files.

The help files shown in this manual are part of the explanations!

NOTE: The help system is currently under development and will be continuously updated.

HELP-EXAMPLES
(Attention – may not always be up to date)



Consist

for defining and activating of a new consist.

TP-Key, Softkey III, Scroll wheel, Number keys

Building a consist:

Softkey III → Jumps to the LoR (bottom half of screen).

Scroll wheel → Select the first vehicle for the consist.

TP-Key + Number-Key (i.e. 1) → Adds the selected vehicle to the consist (the color in the LoR switches to turquoise).

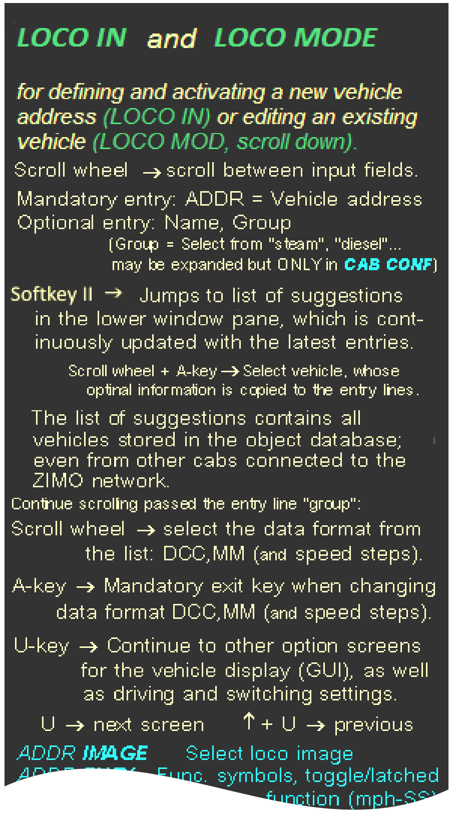
Repeat this procedure for each vehicle to be added to the consist:

TP-Key + Number-Key (i.e. 1).

A consist can receive a number between 1 and 9. The vehicles display changes to turquoise in the LoR as well as in the *LOCO* display.

The vehicles can be controlled after closing the LoR like all other (single) vehicles in the *LOCO* display. TP-Key: Scrolls among the vehicles of a consist. F- / U-Key: Scrolls among all vehicles in the LoR.

Removing a vehicle from a consist (when LoR is open): Briefly press the TP-Key. The last remaining vehicle of a consist also delets the consist. All vehicles will be shown in green again.



LOCO IN and LOCO MODE

for defining and activating a new vehicle address (LOCO IN) or editing an existing vehicle (LOCO MOD, scroll down).

Scroll wheel → scroll between input fields.

Mandatory entry: ADDR = Vehicle address
Optional entry: Name, Group
(Group = Select from "steam", "diesel"... may be expanded but ONLY in ***CAB CONF***)

Softkey II → Jumps to list of suggestions in the lower window pane, which is continuously updated with the latest entries.

Scroll wheel + A-key → Select vehicle, whose optinal information is copied to the entry lines.

The list of suggestions contains all vehicles stored in the object database; even from other cabs connected to the ZIMO network.

Continue scrolling passed the entry line "group":

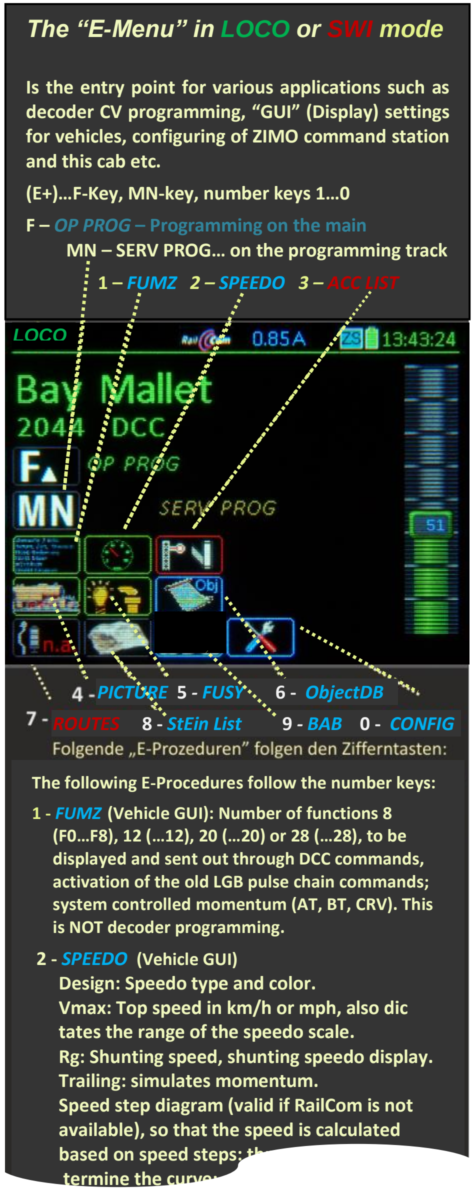
Scroll wheel → select the data format from the list: DCC,MM (and speed steps).

A-key → Mandatory exit key when changing data format DCC,MM (and speed steps).

U-key → Continue to other option screens for the vehicle display (GUI), as well as driving and switching settings.

U → next screen ↑ + U → previous

*ADDR **IMAGE*** Select loco image
ADDR FUNC Func. symbols, toggle/latched function (mph-SS)



The "E-Menu" in LOCO or SWI mode

Is the entry point for various applications such as decoder CV programming, "GUI" (Display) settings for vehicles, configuring of ZIMO command station and this cab etc.

(E+)…F-Key, MN-key, number keys 1…0

F – *OP PROG* – Programming on the main
MN – SERV PROG… on the programming track

1 – *FUMZ* 2 – *SPEEDO* 3 – *ACC LIST*

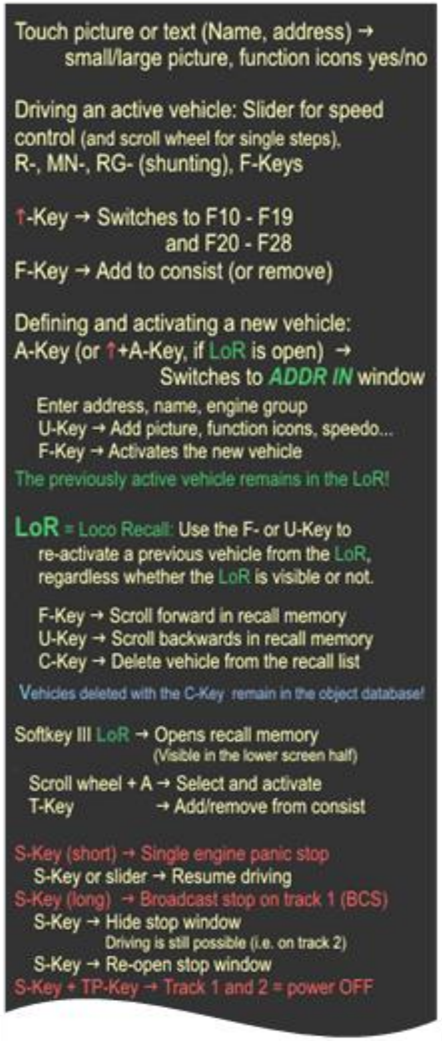
4 - *PICTURE* 5 - *FUSY* 6 - *ObjectDB*
7 - *ROUTES* 8 - *StEin List* 9 - *BAB* 0 - *CONFIG*

Folgende „E-Prozeduren" folgen den Zifferntasten:

The following E-Procedures follow the number keys:

1 - *FUMZ* (Vehicle GUI): Number of functions 8 (F0…F8), 12 (…12), 20 (…20) or 28 (…28), to be displayed and sent out through DCC commands, activation of the old LGB pulse chain commands; system controlled momentum (AT, BT, CRV). This is NOT decoder programming.

2 - *SPEEDO* (Vehicle GUI)
Design: Speedo type and color.
Vmax: Top speed in km/h or mph, also dic tates the range of the speedo scale.
Rg: Shunting speed, shunting speedo display.
Trailing: simulates momentum.
Speed step diagram (valid if RailCom is not available), so that the speed is calculated based on speed steps: th termine the curve



Touch picture or text (Name, address) →
small/large picture, function icons yes/no

Driving an active vehicle: Slider for speed control (and scroll wheel for single steps),
R-, MN-, RG- (shunting), F-Keys

↑-Key → Switches to F10 - F19
and F20 - F28
F-Key → Add to consist (or remove)

Defining and activating a new vehicle:
A-Key (or ↑+A-Key, if LoR is open) →
Switches to *ADDR IN* window
Enter address, name, engine group
U-Key → Add picture, function icons, speedo...
F-Key → Activates the new vehicle
The previously active vehicle remains in the LoR!

LoR = Loco Recall: Use the F- or U-Key to re-activate a previous vehicle from the LoR, regardless whether the LoR is visible or not.

F-Key → Scroll forward in recall memory
U-Key → Scroll backwards in recall memory
C-Key → Delete vehicle from the recall list

Vehicles deleted with the C-Key remain in the object database!

Softkey III LoR → Opens recall memory
(Visible in the lower screen half)
Scroll wheel + A → Select and activate
T-Key → Add/remove from consist

S-Key (short) → Single engine panic stop
S-Key or slider → Resume driving
S-Key (long) → Broadcast stop on track 1 (BCS)
S-Key → Hide stop window
Driving is still possible (i.e. on track 2)
S-Key → Re-open stop window
S-Key + TP-Key → Track 1 and 2 = power OFF

2. Turning the controller ON/OFF and rebooting it

Depending on the situation, a **tethered MX32 or radio controller MX32FU is turned on** as follows:

- **Starting up the system** (= connecting the power supply to the command station or turning on the power supply), with the controller already connected.
- **Connecting the controller to the command station** using a CAN bus cable (with the command station already running).
- **Radio controller: Press the A-Key for more than 1 sec** turns on the controller and establishes radio communication.

NOTE: The cab must be registered at the command station beforehand by connecting the radio cab with the command station at least once, using the supplied CAN cable. No radio communication will be established if the cab was connected to a different command station (which is no longer in range). The cab must be turned off before it can be connected to a different command station, because the registration only takes place during the cab's boot-up sequence.

NOTE: The **MAN-Key** flashes red when the cab is connected for the first time, which indicates that no vehicle has been selected yet. That's also the reason, the *LOCO IN* display is shown.

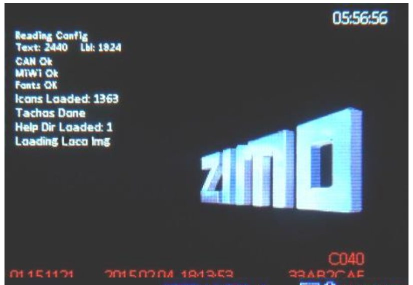
In all these cases, a **boot-up sequence** is performed first (10 – 50 sec. depending on HW/SW version and the amount of data). Also displayed is the currently loaded **software version** and the info about the command station **("connected with ...")** WARNING comes when connected control panel NOT home system.
The **controller automatically enters operation** after finishing the boot-up sequence by switching to the…

- … (**if** the controller is new or "**empty**") *LOCO IN* ▶ the address, data format and (if desired) the loco name and group can be entered here. The vehicle can then be activated with the **F-key.** See chapter "Simple Driving Mode".

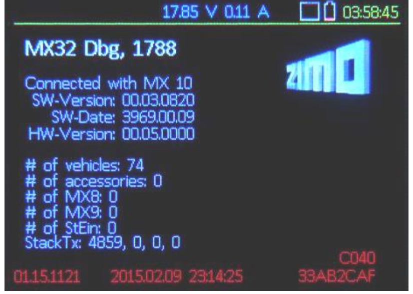
  Entries from the object database are displayed in the lower half of the display (after address entry). Press **Soft-Key II** to jump to the object database and use the **scrolling wheel** and the **A-key** to make a selection.

- …(**if** the controller is **not** empty because it was ▶ used before without deletion) *LOCO* or *SWI* display, showing the same vehicle and data that was active before the last shut down. The vehicle shown can now be operated immediately.

NOTE: there are differences (especially concerning the GUI) depending on whether connected MX10 is the "Home System" or not. See chapter *CONFIG, GUI!*



05:56:56
Reading Config
Text: 2440 Lbl: 1924
CAN Ok
MiWi Ok
Fonts OK
Icons Loaded: 1363
Tachos Done
Help Dir Loaded: 1
Loading Loco Img



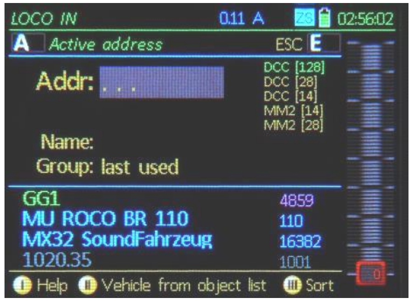
17.85 V 0.11 A 03:58:45

MX32 Dbg, 1788

Connected with MX 10
SW-Version: 00.03.0820
SW-Date: 3969.00.09
HW-Version: 00.05.0000

# of vehicles: 74
# of accessories: 0
# of MX8: 0
# of MX9: 0
# of StEin: 0
StackTx: 4859, 0, 0, 0

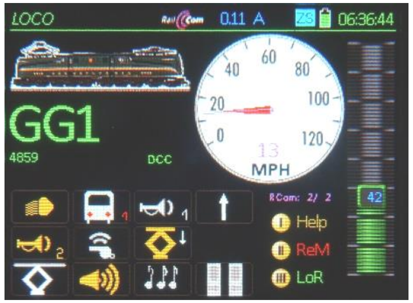
C040
01.15.1121 2015.02.09 23:14:25 33AB2CAF



LOCO IN 0.11 A ZS 02:56:02
A Active address ESC E
Addr: . . .
DCC [128]
DCC [28]
DCC [14]
MM2 [14]
MM2 [28]
Name:
Group: last used

GG1	4859
MU ROCO BR 110	110
MX32 SoundFahrzeug	16382
1020.35	1001

I Help II Vehicle from object list III Sort



LOCO RailCom 0.11 A ZS 06:36:44
GG1
4859 DCC
RCom: 2/ 2
I Help
II ReM
III LoR

NOTE: if a *SWI* panel is the first display, the ▶ function keys are assigned to the switches shown in the display. In order to access the loco functions switch to the *LOCO* mode with the **F-Key**!

- … (if the command station is set to **"START WITH CAB"**) the "Stop balls" are displayed. Power to track-1 or -2 remains OFF until the "ON" fields are tapped. ◢

Turning the controller off by disconnecting the cable:

This does not turn the controller off immediately, but thanks to the built-in battery *) remains on **stand-by** and counts down the time until the controller automatically turns itself off. This can take from 0 to 240 sec depending on the settings in *CONFIG.*

*) The tethered controller MX32 also contains a battery (a smaller one than in the MX32FU). The built-in battery is also used to power the clock while the controller (system) is turned off, as well as to store data (such as the recall memories) for about ½ a year (longer on the MX32FU). This is true as far as the battery has not been heavily depleted due to several long stand-by sequences. ◢

EXIT or Resume from Stand-by:

- **E-Key** ➞ immediate power-down.
- Reconnecting the controller during stand-by
  ➞ restarts without delay (no boot-up sequence).
- **A- Key** (radio controller only)
  ➞ immediately switches to radio mode, without going through the boot-up sequence. ▶

Controller sits idle:

After the controller sits idle for some time (i.e. no buttons are pressed), it switches to the **screen saver**.

Pressing any key ➞ resumes normal operation

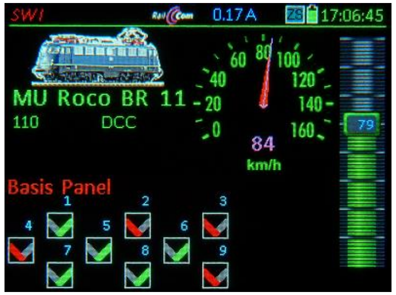
The idle time required before the screen saver mode engages can be set in *CONFIG*. ▶

Turning the system OFF:

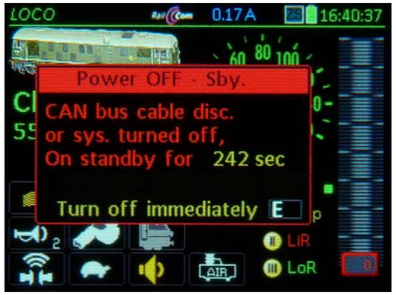
Turning off the command station MX10 (i.e. pulling the plug on the power supply) also turns off all connected controllers without them going to stand-by.

Shut-down procedure for radio controllers:

Occurs the same way as with the tethered controllers. In any other case: press and hold the **E-key**, meanwhile briefly press the **A-key** ➞ the radio controller shuts down immediately.



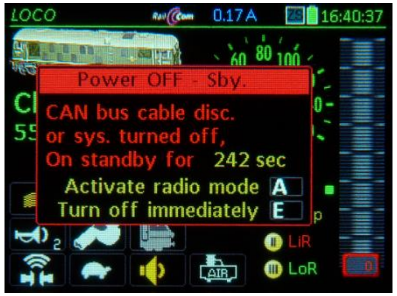
SWI RailCom 0.17 A ZS 17:06:45
MU Roco BR 11
110 DCC
84
km/h
Basis Panel



LOCO RailCom 0.17 A ZS 16:40:37

Power OFF - Sby.
CAN bus cable disc.
or sys. turned off,
On standby for 242 sec
Turn off immediately E

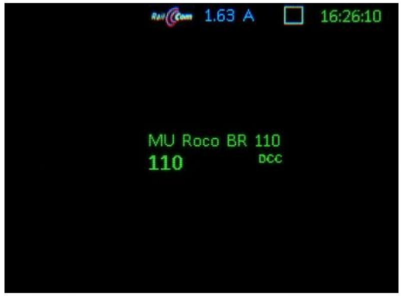
II LiR
III LoR



LOCO RailCom 0.17 A ZS 16:40:37

Power OFF - Sby.
CAN bus cable disc.
or sys. turned off,
On standby for 242 sec
Activate radio mode A
Turn off immediately E

II LiR
III LoR



RailCom 1.63 A 16:26:10
MU Roco BR 110
110 DCC

2a. The Special Features In Radio Mode *(MX32FU)*

This chapter is only valid for the operation with the MX10 command station; no radio with Roco Z21.

The wireless MX32FU controller can be operated in tethered mode or radio mode. The controller behaves exactly like a “normal” MX32 when operated in tethered mode. While connected to the CAN bus, the battery is charged when necessary: due to the extra power consumption the otherwise possible CAN bus cable length is reduced (not for charging purposes but for driving on the CAN cable), but this is only noticeable in rare cases.

The operation in radio mode is completely identical, but there are some inevitable limitations (i.e. ACC LIST and SWI), where delays in the synchronization between controllers are possible, because the radio transmission is generally less reliable and sometimes slower.

IMPORTANT: Registration in the System:

Before a MX32FU controller can communicate wirelessly with the command station MX10 it must be registered with that command station.

Therefore, the radio controller is connected with a 6-pin CAN bus cable to one of the ZIMO CAN bus sockets on the MX10, so the controller starts up in tethered mode (at least until the boot-up sequence is finished). During that time, a system code (= identification number of the command station) is transferred and stored in the controller.

ATTENTION: The controller must be turned OFF before connecting it to the command station for the registration to take place. Whether the command station itself is already turned on when the controller is plugged in, or turned on after, is irrelevant.

NOTE: If MX31, MX8 and/or MX9s are connected to the MX10 and the two ZIMO CAN sockets are thereby occupied, the registration can also be done via the 8-pin CAN cable on the XNET socket of the MX10 (see chapter “Typical MX32 System Configurations”).

Only then, the controller can operate in radio mode. The radio mode will be entered into immediately after registration, by disconnecting the CAN bus cable from the controller and pressing the A-key. The link to this command station through the system code is permanent until the controller is connected to another command station.

The MX32FU is turned on in radio mode by pressing/holding the A-key. The radio communication begins, if the MX32FU is in range of the MX10, the radio controller was registered with earlier.

The continuous monitoring of the wireless connection:

The quality of the wireless connection between the controller and command station (MX10) is indicated by two elements in the MX32 display header:

- Alternating display between **Antenna icon with bar graph** shows the field strength of the radio signal received:
  - green: good strength; no communication delay is expected,
  - yellow: satisfactory reception quality but close to the critical zone,
  - red: unreliable reception, that is, communication may still be OK but may fail at any time.
- and the number of **received messages** (number of received messages out of 20 sent from the control panel per sec)
  - 20 (even if occasionally 19 and rarely 18): optimal
  - <18 (frequent): critical, the smaller the worse.

In the event of poor reception (even with good field strength, it may be interference from external radio networks, such as Wi-Fi), it is first recommended to change the radio channel on the base unit: From normal operation key 2 → MENU, there select "Radio channel" (rotary button), activate (press rotary button), change channel number (rotary button).

- **Radio diagnostic information** in the green line (NOT necessarily to be observed by the "normal" user): radio transmission and reception processes become visible through color sections.
- **Communications dot** shows a delayed or failed connection:
  - Flashes every time a change is made on the MX32: high quality wireless connection,
  - Sometimes longer "dark" periods: Medium quality,
  - Permanently "dark": radio connection failed; see explanations below.

Inidcators and remedies for radio communication loss:

A time-staggered display system informs about radio reception problems:

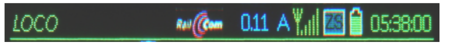
If no radio communication for **150 msec**: Communications dot is continuously red; see above,
If no radio communication for **1 sec**: the function key LEDs or the function icons in the display are flashing after they are pressed; the display’s speed regulator icon flashes after moving the actual regulator,
If no radio communication for **5 sec**: “No RF confirmation” is displayed in the header.

A- Key → Confirms and closes window (the warning remains in the header)
E- Key → Turns off the controller.

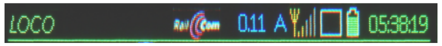
Battery charge status indicator:

- The **battery icon** in the MX32 display header informs about the approximate state of charge, from which the remaining operating time can be estimated.

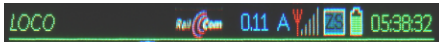
- The **“BATTERY BELOW 10%” - WINDOW** appears if the controller operation is only guaranteed for a short period of time (an estimate is given). The user then has two options:
A- Key → Confirm and close the window. The controller can then be used normally; the message “CHARGE BATTERY…” returns periodically with reduced time remaining.
E- Key → Turns off the controller immediately.



◀ Antenna symbol and communications dot during normal radio reception.



◀ … with poor reception

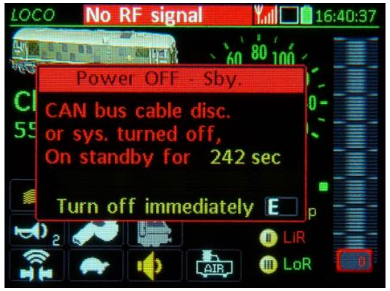


◀ … with brief interruptions

Header shows “No RF confirmation “ ▶

This means that no acknowledgements are coming to earlier commands (speed, functions…) sent to the command station. But this does NOT necessarily mean that the orders have not arrived; they could have been carried out anyway!

NOTE: the wireless range is not always symmetrical, i.e. the direction MX32 → MX10 may work better than the direction MX10 → MX32.


LOCO No RF signal 16:40:37

Power OFF - Sby.

CAN bus cable disc.
or sys. turned off,
On standby for 242 sec

Turn off immediately E

Turning the radio controller off:

Press and hold the **E- Key**, then briefly press the **A- Key,** release the **E- Key** → Radio controller turns off immediately. The radio controller also turns off automatically when the MX10 command station powers down.

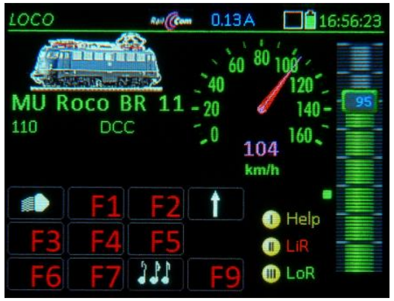
3. Simple driving mode (for first time users)

This chapter describes how a new user can quickly call up and drive his locomotives. It is assumed here that these engines have already been programmed with a known address, if not see chapter "*Simple Addressing & Programming"*.

From the **"normal" driving screens,** either ***LOCO*** (various representations, mostly with function icons or LoR in the lower display half) or ***SWI*** (with switch icons), the address input screen ***LOCO IN*** can be called up anytime with the **A-Key** (with ↑ -Key **+ A** from ***LOCO*** with visible LoR), to enter data of a new vehicle and activate it with the **F-key:**

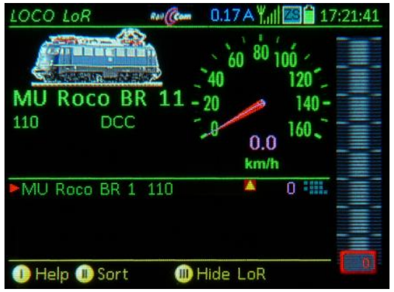
The ***LOCO IN*** screen appears by default only after booting up a **completely new** or **empty controller**!

Function icons in lower screen half



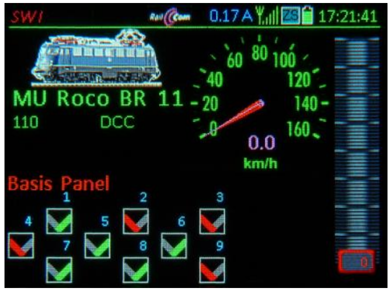
or

LoR in lower screen half



or

Accessory panel in lower screen half

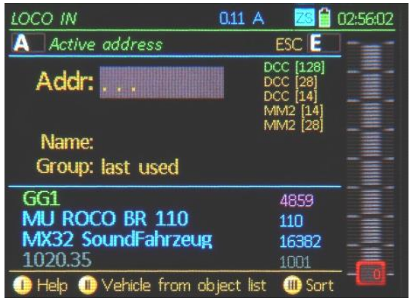


A

↑ + A

↑ first, because A-key by itself is used for selection in the LoR.

A



An excerpt from the object database of the controller is listed in the lower half of the screen, which matches the previously entered digits (of the address) or characters (of the name). This way, if a vehicle already exists in the controller, a quick selection can be made from this list.

Softkey II ➝ Switches to the vehicle list of the Object Database

Scrolling wheel ➝ Scrolls in the list

A- Key ➝ Accepts the selection and moves the same to the upper field

(From there: activate with the F-Key)

NOTE: If the address of the vehicle in question is unknown, it can be determined with the **"Address Search"** feature (activation with **TP-Key)**! See chapter ***LOCO IN***! Minimum software version 01.22.0001 (System) and 37.16 (Decoder).

NOTE: (to the photos on the left): The display pictures are examples for the many possible representations in the operating modes ***LOCO*** and ***SWI*** (with/without image, large/small image, with/without speedo, different speedo designs etc.).

NOTE: (to the pictured "MU ROCO…"): This vehicle with the address 110 is stored by default in the device and can be accessed as a template for a full GUI (graphical user interface) by typing and activating the address 110 on the ***LOCO IN*** page (see below). It can, of course, be deleted from LoR and Object Database if desired (as any other created vehicle). See "Object Database".

This factory stored address 110 is not the so-called "sample" address; the latter is address 16383 by default and does not appear in the Object Database, cannot be used as an operational address (because the address is outside the DCC range of 1 - 10239) and is only used to determine which GUI elements are to be assigned automatically when activating a new address (= not yet in the system). These are by default: a green speedo and the function icons "light" or "sound on / off") for F0 and F8; see chapter "***CAB CONF***" (in "Operating mode ***LOCO***").

After switching to ***LOCO IN***, the **desired vehicle address** can be entered (if not taken over from the object list, see left):

Numeric keypad ➝ **Vehicle address** ▶
(Use C-key for deleting individual characters)

After that, either immediately

F- Key ➝ **activates** the new vehicle (with the entered address, but without a name) and switches to the ***LOCO*** mode.

or

A- Key ➝ switches to the input field "Name" (or use the Scrolling wheel to move to the next line)

Keypad ➝ enter a **Name** using the ↑ (Shift) key to switch between ABC, abc, 123 (indicated at the end of a word)

and then

F- Key ➝ **activates** the new vehicle (with entered address and name) and switches to the ***LOCO*** mode.

or

right after entering a name:

A- Key ➝ switches to the input line "Group"

Rocker Switch ➝ Select a **Group**
(optional, has no functional significance)

F- Key ➝ **Activates** the new vehicle (with entered address, name and group); controller switches to operating mode ***LOCO***

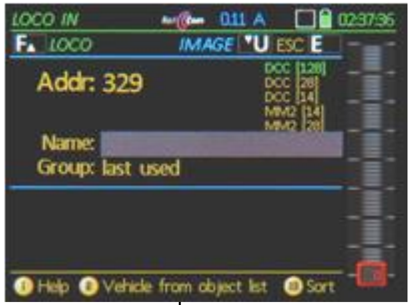
optional

The following is only necessary when a specific track format, other than the standard DCC with 128 speed steps, is required.

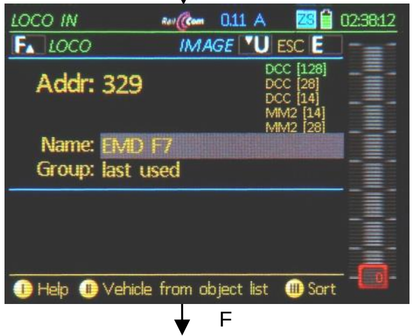
Scrolling wheel ➝ Select from the list **DCC** or **Motorola** (MM) **format** (with various speed steps) in the upper right of the display

F- Key ➝ **activates** the new vehicle with entered address and data format (possibly name and group); controller switches to operating mode ***LOCO***.

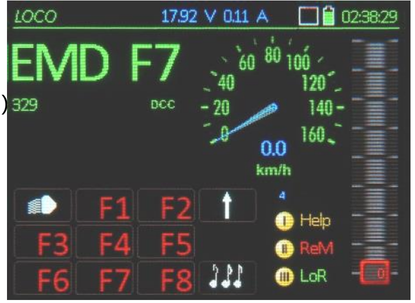
NOTE: Appropriate GUI elements from the controller or command station database are automatically added upon activation!



A



F

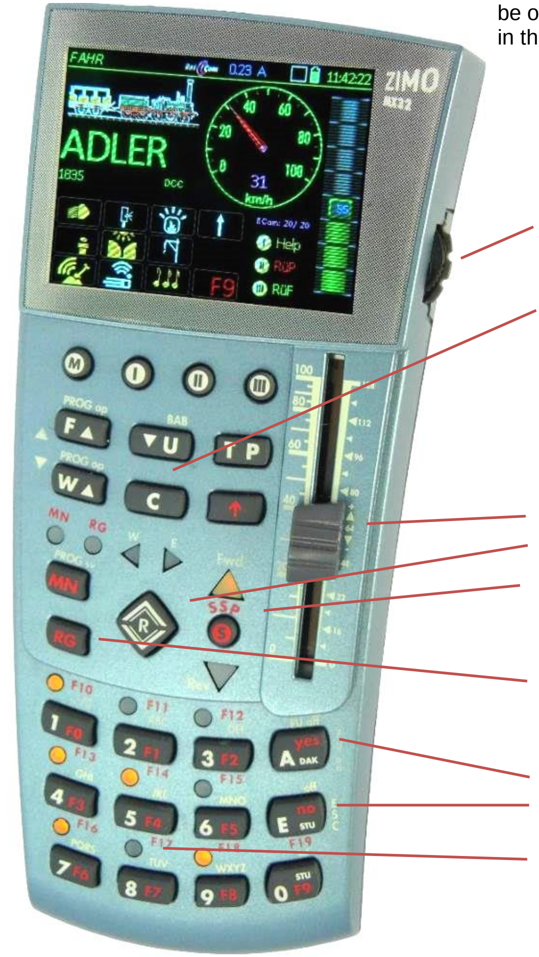


An **"Address in use"** warning appears when the address is already active on a different controller. The address can then, if desired, be taken over with the U-Key. Also see ***"External & Computer Control".***

After activating the new address, that is, after switching over to the driving mode ***LOCO*** with the F-Key***,*** the loco can be **operated with the following controller elements**:

- **Slider for speed control**,
- **Scrollinging wheel** for fine speed control (+/- 12 steps from 128) or scrolling inside ***LoR,*** if open, or volume control while function key is pressed.
- **Rocker switch** to browse inside the ***LoR *),*** if it is invisible (in the background).
- **R-Key** to change direction.
- Function keys F0 … F9 (= the **numeric keys 1 … 0**),
- and ↑ (Shift) key, for F10 … F19 or ↑↑ F20 … F28; ↑↑↑ back to F0 ... F9
- **S-Key**, pressed briefly = emergency stop (if set as default in ***CAB CONF***),
- **S-Key**, press/hold = broadcast stop (if set as default in ***CAB CONF***),
- **S-Key** + **TP-Key** = track power OFF.

*) ***LoR =*** "Loco Recall" memory, in which all previously active addresses are stored. Can be opened with softkey III. More information in the column to the right.



Rocker switch

Scrolling wheel

"Small" keys:
Switch between operating modes etc.
F (next address ***LoR***),
W (***SWI***tches),
U (Previous address ***LoR***)
C (delete visible address),
↑ (Shift) higher functions

Speed slider

R- Key (Direction)

S- Key (Stop)

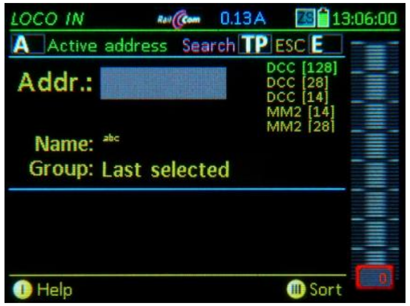
RG- Key (Shunting)
LED yellow: Half- or 1/3 - speed

A- Key (Enter ***LOCO IN***)
E- Key (***E-Screen***)

Function Keys F0 ... F9
(= Numeric keys 1 … 0); with ↑ (Shift) to the higher **F-Keys**

To activate **other locos:** **A- Key** → Switches to the ***LOCO IN*** display.

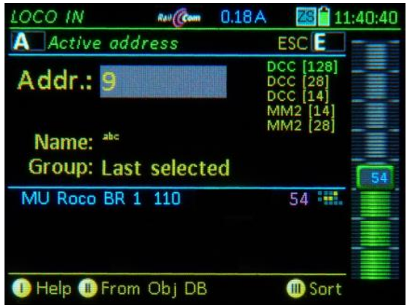
ATTENTION: only possible if ***LoR*** is NOT displayed.
If ***LOR*** is displayed, switch with:
↑ (Shift) **+ A-Key** → ***LOCO IN***)


LOCO IN 0.13A 13:06:00
A Active address Search TP ESC E
Addr.:
DCC [128]
DCC [28]
DCC [14]
MM2 [14]
MM2 [28]
Name: abc
Group: Last selected
Help Sort

◀ Enter new vehicle address.

NOTE: An accessory address can also be entered in the ***LOCO IN*** display but is activated with the **W- Key** instead of the F-Key. See chapter ***ACC LIST***!

↓ F


LOCO IN 0.18A 11:40:40
A Active address ESC E
Addr.: 9
DCC [128]
DCC [28]
DCC [14]
MM2 [14]
MM2 [28]
Name: abc
Group: Last selected
54
MU Roco BR 1 110 54
Help From Obj DB Sort

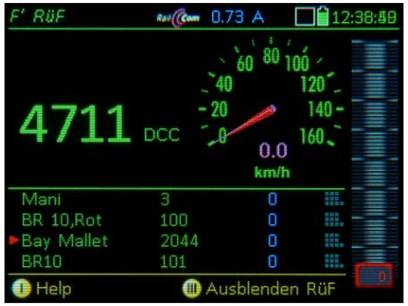
F-Key → **Activates** the new engine

(In this example without a name) and switches over to the operating mode ***LOCO***.

Softkey III → Show / hide Loco Recall (***LoR***)

The Loco Recall list opens in place of the function icons and lists the vehicles currently stored in the recall memory.

↓ III ↑


F' RüF 0.73 A 12:38:59
4711 DCC
0.0 km/h
Mani 3 0
BR 10,Rot 100 0
▸Bay Mallet 2044 0
BR10 101 0
Help Ausblenden RüF

◀ All vehicles that were activated once are automatically entered into the ***loco recall memory*** (LoR) including their last valid GUI and driving data, so they can be recalled and activated again when needed.

The LoR is also called "background memory", from which vehicles can be brought to the "foreground" by activating them.

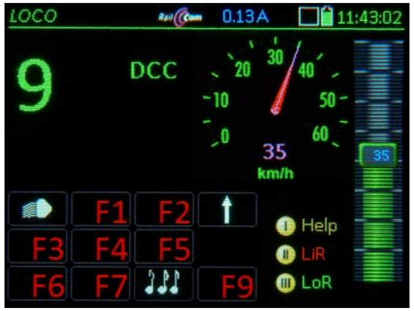
The LoR is also working when in the background, that is, when it is NOT visible. Making it visible with Softkey III offers a convenient overview and quick selection using the scrolling wheel.

However, vehicles can be activated one by one from the ***LoR*** with the F and U-Key, whether the ***LoR*** is visible or **invisible**. Vehicles can be deleted from the ***LoR*** with the C-Key.

The open ***LoR*** shows for each vehicle:

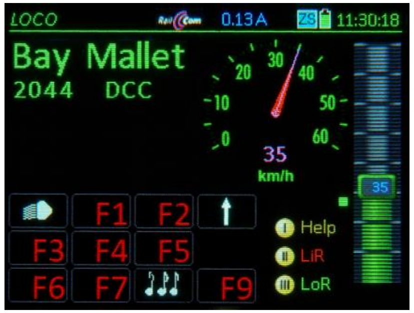
Name, Address, Consist Info, Speed step or RailCom-Actual speed, Functions F0-F9, (after rocker switch) Direction, MAN and Position.

NOTE: By **tapping** the display areas (Name/Address, Picture, Speedo) different representations of the ***LOCO*** screen are displayed, i.e. large picture (full width), **Name** in large font or **in full length** (full display width, but possibly dropping other components). See Chapter ***"LOCO".***

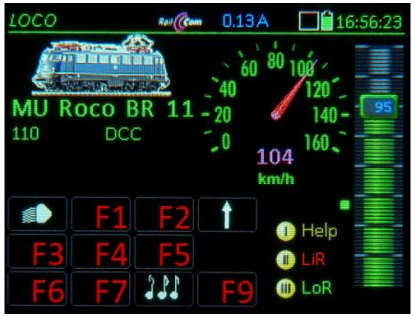


F →

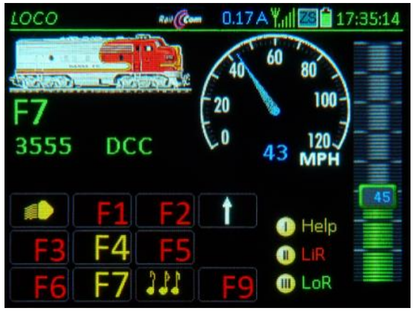
U ←



↓ F ↑ U



↓ F ↑ U



Switching between vehicles:

F- Key or **U- Key** ➞

in the ***LoR*** **=** Loco Recall ▶

Scrolls through the loco recall memory forward or backwards one address at a time. Every address is automatically activated as it becomes visible, which means that there is no need to close the driving mode ***LOCO*** during this procedure.

This works **regardless of whether** the ***LoR*** is **displayed** (visible) or not.

Deleting locos from the LoR (recall memory)

C- Key ➞ Deletes an address from the ***LoR***, and will therefore no longer appear when scrolling through with the **F-Key** and **U-Key**.

Recovering deleted addresses:

Addresses deleted from the ***LoR*** remain in the ***Object Database*** with all their data (especially the GUI's).
To restore an address back in the ***LoR***, simply activate it again on the ***LOCO IN*** page. Entering the address is all that's needed since the GUI settings such as name, group and speed steps (DCC, MM2…) will be added automatically from the ***Object Database.***

To delete the address permanently from the ***Object Database,*** the corresponding operations mode must be entered first: **E-Key + 6** ➞ ***Object DB*.**

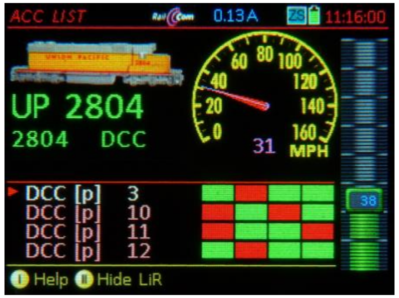
NOTE: to assign a **New Address** of an existing vehicle:
- go to ***SERV PROG***: **A- Key** (read-to address), enter new address, confirm with **F- Key**.
- through "Clone vehicle" (see page 28): clone a vehicle using a new address.

Das „REGLER-EINFANGEN" …

beim Wechseln zwischen Fahrzeugen (nicht nur im oben beschriebenen Fall, sondern zu verschiedenen Gelegenheiten) passt die **Stellung des Reglerknopfes** meistens nicht zur aktuellen Fahrstufe; eine **flackernde rot-grüne Linie im Fahrbalken** markiert, wohin der Knopf bewegt werden muss.

Blue speedo needle: value for the speed is calculated from speed steps
Magenta speedo needle*:* actual speed feedback from vehicle
The RailCom speedo may need to be adjusted with CV #136 to show the actual speed.
A quick way to calculate and program CV #136 for speedo adjustment is possible with E + 2 keys.
(See chapter ***ADDR SPEEDO***).

↓ II ↑



Softkey II *LiR* ➞ Opening and closing the ACC ***LIST***

is an alternate option for activating the accessory items (switches and signals: it is **address-oriented** instead of object-oriented)

W- Key ➞ **Object-oriented** mode for ***ACC*** switching (see next chapter).

Accessory decoder addresses can be added to the ***ACC LIST*** and addresses already there can be accessed, operated and modified. All addresses assigned to the ***SWI*** panels are automatically added to the ***ACC LIST*** and can therefore be operated there as well. Any MX8, MX9 or StEin modules in the system will also be listed here automatically and can be operated with the corresponding function keys.
.

To define an **additional address,** it is necessary to first scroll down to the line >NEW<; to **edit an existing address,** it must be marked first with the red cursor (**Scrolling wheel**):

- **A- Key**: "DCC [e]" (single) is created and can be changed with the rocker switch to:
  "DCC [p]" (paired) "MM1 [e]" (Motorola; single)
  "DCC [x]" (extended) "MM2 [p]" (Motorola; paired)

- **A- Key** press again to confirm the format and mode (single or paired outputs) and continue to the address input using the keyboard.

- Press the **A-Key** again to store and activate the accessory decoder address.

Other than that, the keys are used for the following tasks:

Numeric keys ➞ operate the individual turnouts (or single functions)
Scrolling wheel ➞ select a line in the ***ACC LIST***
C- Key ➞ delete a line in the ***ACC LIST***

Exit the *ACC LIST* with:

Softkey II ➞ closes the ***ACC LIST*** and returns to ***LOCO***.
↑ (Shift) + **A- Key** ➞ ***LOCO IN*** (to enter a new vehicle)
E- Key ➞ ***E-Screen***

With the *ACC LIST* visible in the lower screen half:

U- / **F- Key** ➞ switches between vehicles (within the ***LoR***) without leaving the ***ACC LIST.***
TP- Key ➞ consist functions, same as in the ***LOCO*** mode (but only if ***LoR*** is not open).

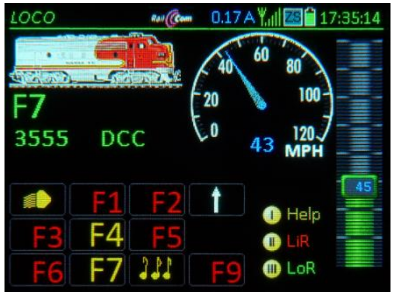
More information concerning driving, especially about the different representations, consists, and operating turnouts and signals in the accessory list:
See chapter ***LOCO*** and ***ACC LIST***!

4. Simple turnout control (the first time)

Operating turnouts and signals in the MX32 follows an **object-oriented** approach: In a "panel" of turnout and signal icons (the "panel" as a precursor to the track diagram), the individual "object" is operated by pressing the corresponding function key. Each object or display icon must be assigned to the corresponding decoder address (and/or sub address, number etc.) in a **previously executed definition process**.

> **NOTE**: Entering and operating an accessory address: **A- Key** ➞ ***LOCO IN***, enter the desired address, then **W- Key** ➞ ***ACC LIST***, operate or edit turnout / signal. Softkey II ➞ returns to ***LOCO.***

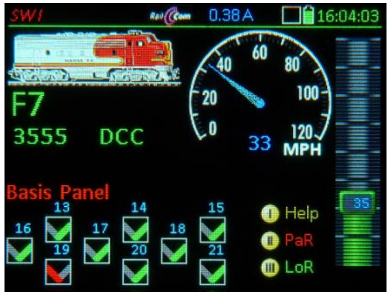
W- Key (from ***LOCO*** mode) ➞ Operating mode ***SWI:*** the lower display half shows a “Basis Panel” filled with 18 “V” symbols, of which 9 are visible:



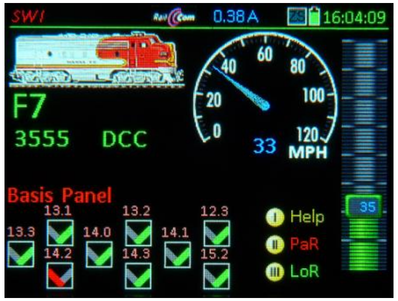
←

W

→



Numeric keys **1…9** ➞ operate the visible icons. The 18 fields of the “Sample Panel” are preassigned to the accessory decoder addresses 10.0, 10.1, 10.2, 10.3, 11.0, 11.1, 11.2… with its 4 sub addresses (0…3).



↑ (Shift) ➞ displays the decoder addresses instead of the field numbers. ▶

Scrolling wheel ➞ Scrolls within the panel

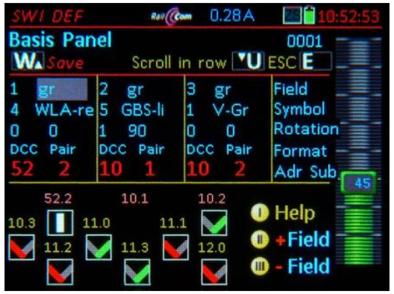
The default “V symbols” can be interpreted as universal left-right switches or as red-green signals. They are, however, not real switchboard fields but can be exchanged with proper icons (on the ***SWI DEF*** definitions page).

The quickest way to change the default accessory addresses is with this shortcut:

↑ (Shift) **+ W + ↑** (Shift) ➞ Opens the ***SWI DEF*** page, but (because of ↑) the cursor jumps immediately to the address input line (with sub addresses…) and enables the “inline scroll option”, which allows the addresses to be changed one by one without any further scrolling, confirming each with the **A-Key**; use the **U-Key** to switch between “scroll in line” / “scroll panels”.

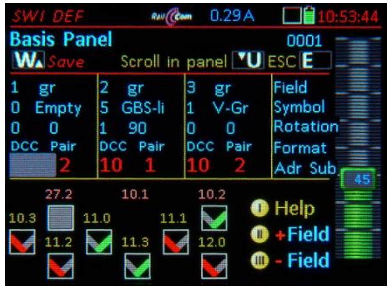
↑ (SHIFT) **+ W** (without the extra ↑ (Shift)) ➞ Opens the definition’s page. Start with the top left field gr/rg – setting, go to all other fields using the scrolling wheel.

↑ W

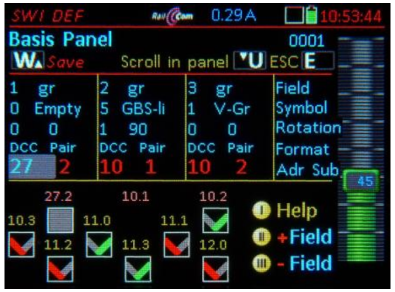


→

↑

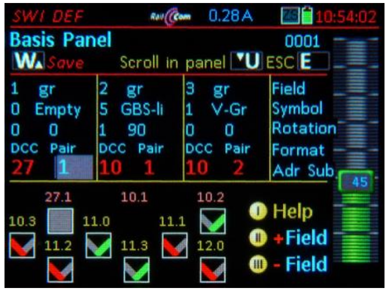


26



→

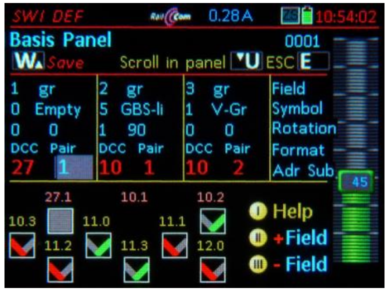
A, 1

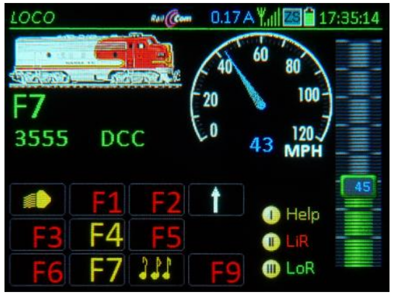


Exit to the ***SWI*** panel after the desired changes are made in ***SWI DEF*** with:

W- Key ➞ saves the newly entered data (i.e. the addresses) and returns to the ***SWI*** mode. ▶

E- Key ➞ exits the definition screen WITHOUT saving, back to ***SWI***





◀ **W- Key** ➞ returns to the ***LOCO*** mode.

For more info: go to the chapter dealing with the ***SWI*** operating mode.

5. Simple Address & CV Programming

in *SERV PROG* (at the programming track; **for first time users**)

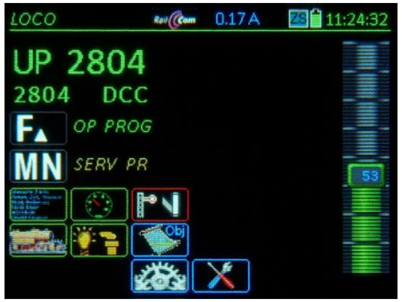
This chapter describes how a first-time user can program a vehicle decoder (or more precise, a locomotive equipped with a DCC decoder) with a new address and how to program and read-out configuration variables (CVs).
For information about accessory decoder programming, go to the chapter ***SERV PROG!***

This section deals with programming in **SERVICE MODE** on the **programming track**, which is connected to the command station output that can be switched over to the programming mode; on the MX10 it is the output "Schiene-2" (on ZIMO command stations it also serves as another "main track").

Start the programming procedure (usually from the ***LOCO*** screen) with the

E- Key → followed by the **MN- Key** ▼ → enters the operating mode ***SERV PROG*** ▼

E →



LOCO 0.17 A ZS 11:24:32

UP 2804

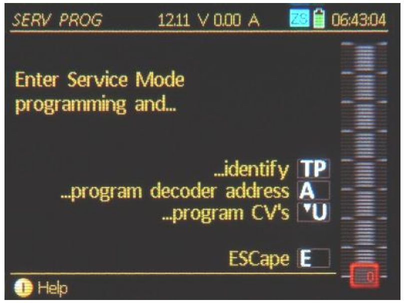
2804 DCC

F OP PROG

MN SERV PR

53

MN →



SERV PROG 12.11 V 0.00 A ZS 06:43:04

Enter Service Mode
programming and...

...identify TP
...program decoder address A
...program CV's U

ESCape E

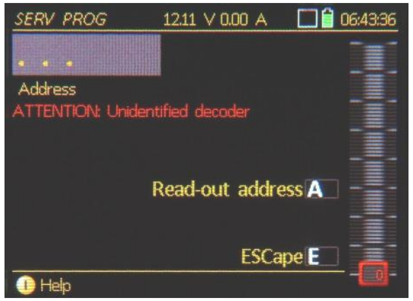
Help

↓ A + A (= zweimal A-Taste)

TP- Key → "identifies" and displays important decoder data such as address, type, version, serial number…

"Identification" can be aborted with:
E-Key → **abort** and return to Serv Prog menu
U-Key → **abort** and switch to CV programming
A-Key → starts address programming and read-out procedure. ▶

If the decoder identification is aborted by immediately jumping into the addressing / programming process, the message "ATTENTION decoder not identified" appears. This only means that there is an uncertainty about the decoder type and the addressing / programming operation is done at one's own risk.



SERV PROG 12.11 V 0.00 A 06:43:36

. . .

Address

ATTENTION: Unidentified decoder

Read-out address A

ESCape E

Help

↓ 110, F

A- Key twice → **reads** the current address

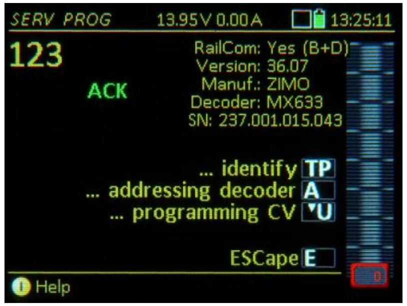
Reading out the address can be omitted (i.e. to enter a new address immediately); without any problems if the decoder was first "identified"; with a certain risk, if it was not.

The vehicle address is **programmed** by

typing a new address - **F- Key**

The system answers with: ▶

ACK Address programmed and confirmed;
NACK Address sent but not confirmed.



SERV PROG 13.95 V 0.00 A 13:25:11

123

ACK

RailCom: Yes (B+D)
Version: 36.07
Manuf.: ZIMO
Decoder: MX633
SN: 237.001.015.043

... identify TP
... addressing decoder A
... programming CV U

ESCape E

Help

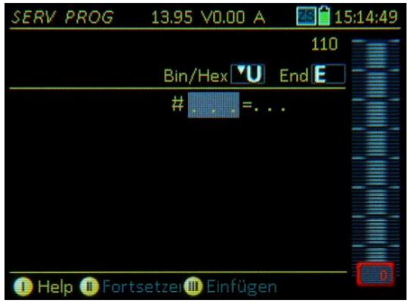
The alert "ATTENTION: Addressing not confirmed" means: the decoder does not send acknowledgement pulses, but the address MAY have been programmed successfully anyway, BUT: when switching from a "small" (0…127) to a "large" address (>127) previously set values in CV #29 (e.g. analog operation) MAY have been erased in the process.

Right after entering ***SERV PROG*** or after reading-out/programming the decoder address or after decoder "identification":

U- Key → to CV programming ▶

> <u>Note</u>: CV programming on the programming track is possible even if the decoder address is NOT known; i.e. if the address has NOT been read out.

U ↓



SERV PROG 13.95 V0.00 A ZS 15:14:49

110

Bin/Hex U End E

. . . =. . .

Help Fortsetze Einfügen

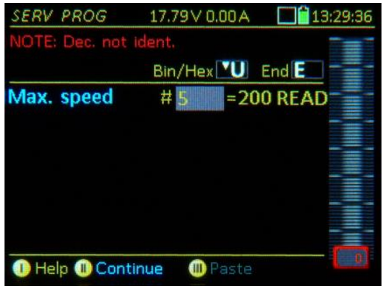
CVs are **programmed** by

Entering a CV number – A-Key – enter CV value – A-Key

or **read-out** by

Typing a CV number – A-Key – A-Key (again)

5, A, A ↓



SERV PROG 17.79V 0.00A 13:29:36

NOTE: Dec. not ident.

Bin/Hex U End E

Max. speed # 5 =200 READ

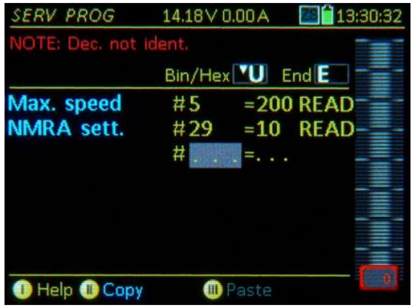
Help Continue Paste

Programming and read-outs are confirmed by the system and displayed in the corresponding line with

ACK	after each successful CV programming
READ	after reading out a CV value
NACK	when programming w/o acknowledgement
NO-R	when read-out was not successful
and	various ERR messages

A read-out attempt (after 2 x A-Key) that causes the CV value to "run" usually means that the read-out will likely fail (only a few old decoders behave like that); it is recommended to abort the read-out with the E-Key!

29, A ↓



SERV PROG 14.18V 0.00A ZS 13:30:32

NOTE: Dec. not ident.

Bin/Hex U End E

Max. speed #5 =200 READ
NMRA sett. #29 =10 READ
. . . =. . .

Help Copy Paste

An automatic line feed occurs after each programming or read-out step in order to immediately proceed with the programming.

To modify a previously processed CV number or value use the scrolling wheel to move up or down a line, even past the visible area.

The MX32 shows the meaning of each CV, if known, in the first column (blue font). If a decoder identification was performed earlier (with the **TP-Key**) and the decoder was therefore identified as a ZIMO decoder, more CV numbers will have a description than third-party decoders or from unknown decoder manufacturers.

E- Key → **exit CV programming** (also: **Interrupting** a running process) or returning to the menu screen (TP, A, U).

E- Key (again) → returns to operating mode (usually ***LOCO***)

> For more info on addressing and CV programming see:
> Programming in Service Mode – Chapter ***SERV PROG,***
> Programming in Operations Mode – Chapter ***OP PROG!***

6. Simple Programming in Operational Mode

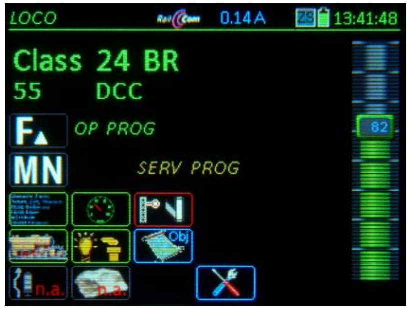
in *OP PROG* (on the main track; **for first time users**)

This chapter explains how configuration variables (CVs) can be read out and programmed.

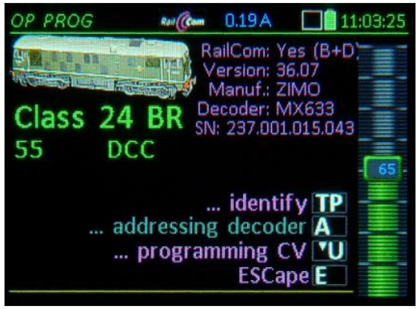
In contrast to Service Mode programming (see previous chapter), **Operational Mode** programming discussed here is NOT done on the programming track but rather on the "normal" **main track** (i.e. track 1 on the MX10 command station) under normal operating conditions. For this reason, Operational Mode programming is also called **"Programming On-the-Main"** (POM).

Start the programming (usually from the driving mode ***LOCO***) with the

E- Key ▼ → and (shortly after) the **F- Key**→ Entry to vehicle identification in ***OP PROG*** ▼



→ F



RailCom: Yes (B+D)
Version: 36.07
Manuf.: ZIMO
Decoder: MX633
SN: 237.001.015.043

Class 24 BR
55 DCC

... identify TP
... addressing decoder A
... programming CV U
ESCape E

From the ***OP PROG*** menu screen, select:

TP- Key → "Second identification" (has already been identified automatically at the beginning) and display of important decoder data such as address, type, version, serial number

> Note: This happens much faster (starts automatically after entrance) in ***OP PROG*** than in ***SERV PROG*** but only if "RailCom" is operational; otherwise, the message "No acknowledgement in OP PROG from this decoder" will be shown.

A- Key → starts **decoder address** programming; where the decoder address can be read out by pressing the A-Key again (i.e. A + A), → the current decoder address will be **read**, or a new address can be typed in and written into the decoder with the **F-** or **W- Key**; see below.

U- Key → starts **CV programming**; where CVs can be read out and programmed; see further down in this chapter!

E- Key → **ends** the Service Mode programming, switches to menu.

E- Key → pressing the E-Key again switches to the operating mode ***LOCO*** with the same address that was active before the programming was started (unlike the **F- Key**, which would activate the identified decoder address).

CVs are **programmed** by

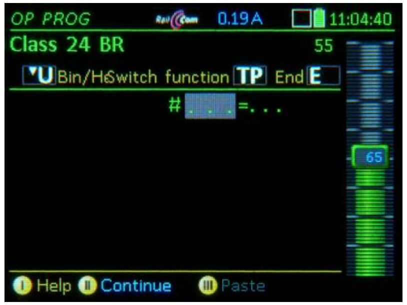
▶

Typing in a CV-number - **A-Key** -
- Entering CV-value - **A-Key**

or **read-out** by

Typing in a CV-number - **A- Key** - **A- Key** (twice)

Programming or read-out steps are acknowledged by the system and displayed (see below).

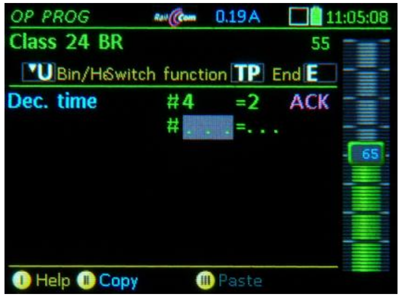


Class 24 BR 55
U Bin/H&Switch function TP End E
. . . =. . .

An automatic line feed occurs after each programming or read-out step in order to immediately proceed with the next CV.

Previously programmed lines can be returned to with the scrolling wheel and edited with different values or CV numbers.

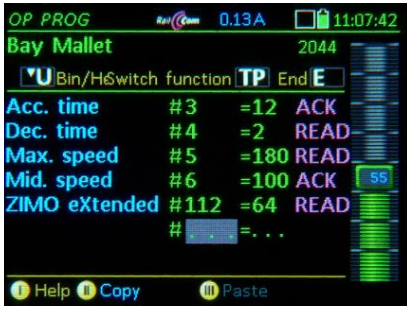
The MX32 also shows the meaning of the individual CVs, if known, in the first column in blue font. If the decoder was recognized as a ZIMO decoder (earlier with **TP-Key**), it shows more information than with another decoder.



Class 24 BR 55
U Bin/H&Switch function TP End E
Dec. time #4 =2 ACK
. . . =. . .

ACK after programming a CV and confirmation by "RailCom".
READ after a CV read-out with "RailCom" (or other feedback system).
SENT after programming a CV when feedback is not available.
NACK after programming attempt without acknowledgement (although feedback system is active)
NO-R after an unsuccessful read-out attempt (usually due to missing feedback).

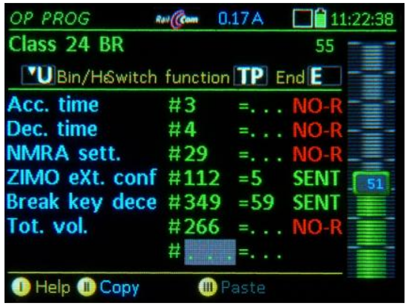
OP PROG ***WITH*** *"RailCom"*



Bay Mallet 2044
U Bin/H&Switch function TP End E

Acc. time	#3	=12	ACK
Dec. time	#4	=2	READ
Max. speed	#5	=180	READ
Mid. speed	#6	=100	ACK
ZIMO eXtended	#112	=64	READ
	# . . .	=. . .	

OP PROG ***WITHOUT*** *"RailCom"*



Class 24 BR 55
U Bin/H&Switch function TP End E

Acc. time	#3	=. . .	NO-R
Dec. time	#4	=. . .	NO-R
NMRA sett.	#29	=. . .	NO-R
ZIMO eXt. conf	#112	=5	SENT
Break key dece	#349	=59	SENT
Tot. vol.	#266	=. . .	NO-R
	# . . .	=. . .	

E- Key → **exits CV programming** (also: **Interrupting** a running process) or exits address programming, and returns to the menu screen.

E- Key (again) → returns to the operating mode (usually ***LOCO***).

For more info to addressing and programming see:
Programming in Service Mode – Chapter ***SERV PROG,***
Programming in Operational Mode – Chapter ***OP PROG***

7. SOFTWARE-UPDATE, uploading ICONS, PICTURES as well as: Saving GUI and other object data, EXPORTING GUI

A flash drive that matches the following criteria is required for carrying out these steps:

FAT32 file format (with an **allocation unit size** of **4096 bytes**) formatted in low-level format, in order to save the large number of files in the USB root directory. A flash drive reserved for MX32 updates (otherwiese empty) is of practical advantage. A proper flash drive comes with each ZIMO controller.

Software-Update and/or loading Data (Icons, Pictures etc.):

The **latest zip file** for the MX32 (i.e. MX10_MX32_01.21_0500 full.zip) is available as free download from www.zimo.at (go to the MX32 update page under **"Update & Sound"**).

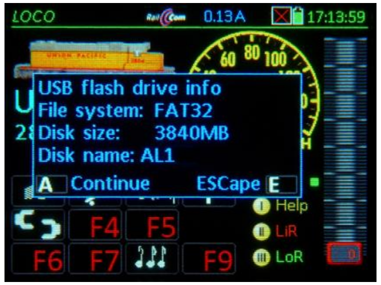
Beginning with software version 01.16.00 (this version MUST be in the MX32 BEFORE it is updated with the next higher update), the zip file comes as a **"container file"**, which holds full versions for both the **MX10** AND the **MX32**. So, if your current version is lower than 01.16 (i.e. 01.15 or lower), the version 01.16 must be installed first BEFORE the version 01.17 or higher can be installed!

After downloading the **.zip file, it must be unpacked** first and the unpacked container file copied to the above mentioned **flash drive,** but NOT the zip file itself. The files must be stored in the **root directory** (not in a folder) of the flash drive because the target devices (MX10 or MX32) cannot open subfolders.

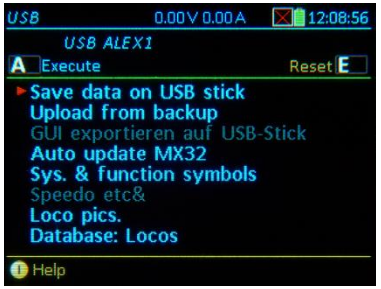
The same flash drive (with the same update file) is then used to update the command station MX10 as well as all MX32 controllers.

> NOTE for controllers built up to 2015: The update process described here has been modified in May 2015 in order to simplify the update procedure.
> The description here does not apply for updates **to** version 01.16, but does **after** 01.16. From a version older than 01.16 (i.e. 01.15 or lower), the version 01.16 must be installed first BEFORE the version 01.17 or higher can be installed!

The flash drive is then **plugged into the running MX32,** which may be done in any operating mode (mostly in the operating mode ***LOCO***). MX32FU must be connected with a CAN bus cable to the MX10. The stick is automatically recognized and read, while some information (size, name…) is being displayed in the flash drive window:


LOCO 0.13A 17:13:59
USB flash drive info
File system: FAT32
Disk size: 3840MB
Disk name: AL1
A Continue ESCape E

USB-Stick → A


USB 0.00V 0.00A 12:08:56
USB ALEX1
A Execute Reset E
- Save data on USB stick
- Upload from backup
- GUI exportieren auf USB-Stick
- Auto update MX32
- Sys. & function symbols
- Speedo etc&
- Loco pics.
- Database: Locos

A- Key → the **"table of contents"** is displayed: a list of entries (in order): "DATA BACK UP to flash drive", "Restore Data", "Automatic MX32 Update" and, after that, the names of expected data (not the actual file names), such as data currently present on the stick (blue) as well as expected that is not on the stick (gray) but could be.

> NOTE: The MX32 display remains readable even if the font is deleted after the update, albeit with a very small font (6 pixels). A new font can be downloaded from the ZIMO website and installed manually: http://www.zimo.at/web2010/updatefiles/fonts120.zip

Scrolling wheel → **select** the desired line from the list

A- Key → starts the selected list position;

Selecting the "**Automatic MX32 Update"** installs the following:

1) the actual software update and
2) the data that is usually part of the new software version (but not data the user created himself or downloaded at his own request. This is being preserved throughout the update), such as

- the fonts and texts in the key operator languages German and English
- the system, function and switchboard icons, speedo dials and instrument graphics,
- the device sound files (Controller sound accessible in ***LOCO IN*** with address 16382)
- the help screens.

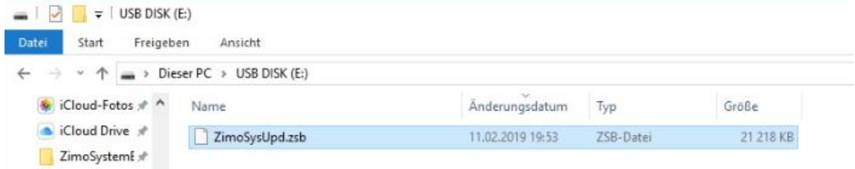
Displayed below that, a list of **data** which is available **either in addition** to the "Automatic Update" (for the new software version) **or alone** (without new software version) on the stick: the detailed composition of these files may change from version to version (new finished features...), but essentially, they are the following:

- System and function icons for functions, speedo, speed slider etc.
- Vehicle instruments (speedos): various speedo designs, amp meter and more
- Switchboard elements: for switch panel displays of the MX32,
- Device sound files: among others warning signals, ambient sound for the MX32 sound (.wav-files),
- Vehicle pictures: lists the picture collections on the flash drive, from which one or the other can be loaded into the controller,
- Databases: vehicles, accessories, switch panels
- CV lists and sets

Automatische Datensicherung auf USB-Stick im Zuge des „Automatic MX32 Updates"

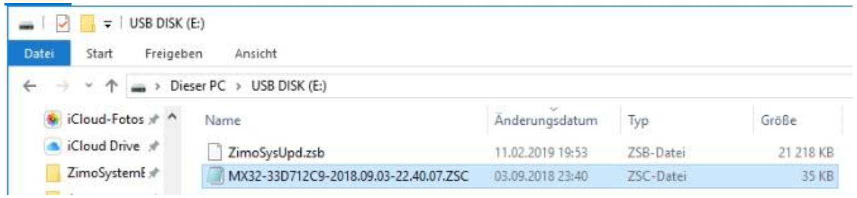
Ab SW-Version 1:26 (ca. März 2019): bei Aufruf des „Automatic MX32 Update" wird automatisch eine Datensicherung der OBJDB (Fahrzeuge) gemacht und auf dem USB-Stick, abgelegt.

VOR dem Aufruf des „Automatic MX32 Update" enthält der Stick das Container-File für das Update und ist idealerweise ansonsten leer:


USB DISK (E:)
Dieser PC › USB DISK (E:)

Name	Änderungsdatum	Typ	Größe
ZimoSysUpd.zsb	11.02.2019 19:53	ZSB-Datei	21 218 KB

Wenn der USB-Stick NACH der Durchführung des Updates wieder am Computer angesteckt wird und überprüft wird, befindet sich zusätzlich eine .ZCS-File mit der Fahrzeugdatenbank am Stick.


USB DISK (E:)
Dieser PC › USB DISK (E:)

Name	Änderungsdatum	Typ	Größe
ZimoSysUpd.zsb	11.02.2019 19:53	ZSB-Datei	21 218 KB
MX32-33D712C9-2018.09.03-22.40.07.ZSC	03.09.2018 23:40	ZSC-Datei	35 KB

Dieses File kann im Falle eines Datenverlusts durch das Update zur Wiederherstellung der Fahrzeug-Datenbank verwendet werden; siehe dazu Abschnitt unten „(Händisch aufgerufene) Datensicherung …".

Importing data (after making a selection, i.e. “System and function symbols” etc.):

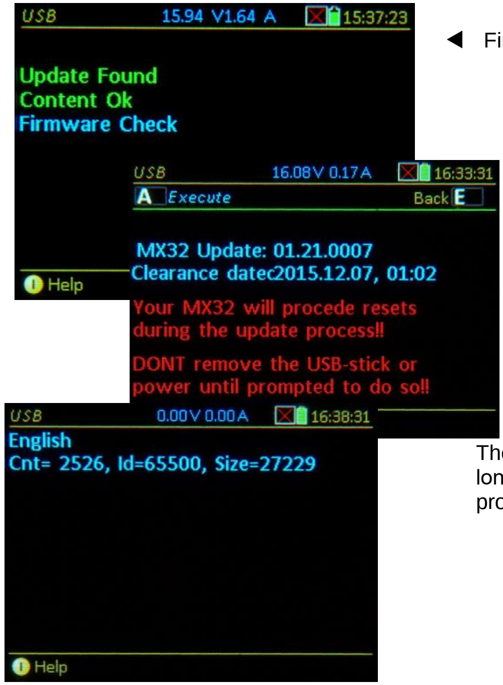
TP- Key → Marks the position to be imported

A- Key → Displays the details of this data line, **scroll** again**, TP- Key** → Select

- Last line: **“Import all marked (selected) data”** **A- Key** → Starts importing data.

The actual update process (after selecting the “Automatic MX32 Update”):

After starting the **“Automatic MX32 Update”** (with the **A- Key** or making a selection and “Import all marked …”) first, an information screen is displayed (current and new software versions as well as other data). From there, a decision has to be made if the update shall really be made:



Update Found
Content Ok
Firmware Check

MX32 Update: 01.21.0007
Clearance datec2015.12.07, 01:02

Your MX32 will procede resets during the update process!!

DONT remove the USB-stick or power until prompted to do so!!

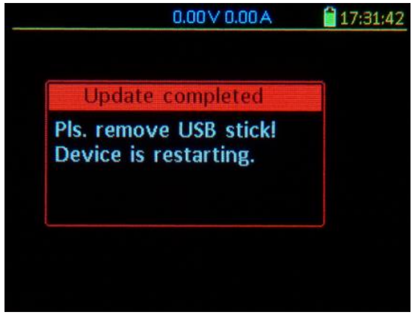
English
Cnt= 2526, Id=65500, Size=27229

◀ Firmware Check: The MX32 tests the software to be loaded for bad or corrupted data and shows the result. After this presentation, the control panel automatically goes to the update information screen.

A- Key (Execute) →

◀ Update information screen: Listing of the software version to be loaded, and its creation date. In addition, it shows the note: "The M32 makes several restarts during the update*!* “

The software update and installation of all data belonging to the “Automatic MX32 Update” is now in progress. This will take a few minutes.



Update completed
Pls. remove USB stick!
Device is restarting.

After the update has finished the controller displays a **screen- prompt to remove the flash drive.** After that, the MX32 always performs an **automatic reset.** →

NOTE: When the SOFTWARE-UPDATE FAILS:

The MX32 display remains dark. In this case DO NOT disconnect the CAN bus cable and DO NOT switch off the command station. A self-protection algorithm reloads the previous software to the microprocessor after a **5 min** waiting period. After this process is finished, the software update can be tried again. An **error message** on the MX32 (cable version only) about the update of a (missing) radio processor is normal, please ignore this message.

Data backup on flash drive / restore from flash drive:

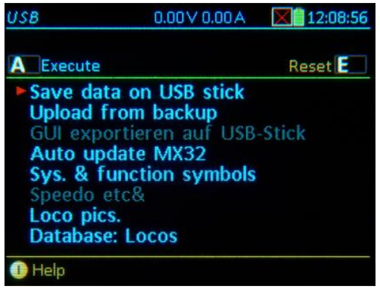
It is best (for clarity's sake) to use an empty flash drive for this purpose (See chapter Software-Update about formatting); although it may contain updates or other data.

As mentioned above, the first table entry that becomes visible after the flash drive is plugged in, is: **"Save data to flash drive"**. If this is selected and started (**A- Key**), a list of securable data such as "Object Database", "Image Database"... appears.

This list may change depending on the software version.

Scrolling wheel → Select a position
TP- Key → Mark the position

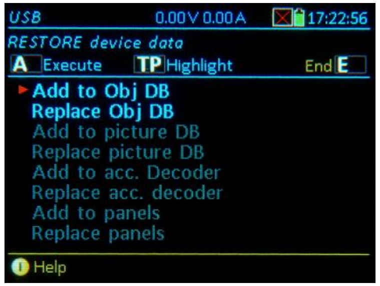
Last line: **“Back-up marked data”**
A- Key → Starts back-up



Save data on USB stick
Upload from backup
GUI exportieren auf USB-Stick
Auto update MX32
Sys. & function symbols
Speedo etc&
Loco pics.
Database: Locos

If there is a **backup** on the flash drive - this can be **from the device itself** or **from another controller**! - the second entry **"Restoring the data backup"** becomes visible and - after selecting it - the list of saved data.

Each position is presented in two forms: with **"... replace**" and "... **add**", depending on whether the previously contained data of the respective type in the controller should stay or be deleted.



RESTORE device data
Add to Obj DB
Replace Obj DB
Add to picture DB
Replace picture DB
Add to acc. Decoder
Replace acc. decoder
Add to panels
Replace panels

Exporting the GUI data of an address to the flash drive:

only usable together with suitable versions of the decoder and the sound programmer ZSP

Unlike the data backup described above, the purpose of exporting is NOT to secure the data, but to **provide the GUI data for sound project expansions.** The exported data such as name, image, function icons, and some other data are then integrated into existing or future sound projects, from where they can be retrieved by the controller as needed; this saves the tedious "manual" input of the "GUI" on the controller.

For this purpose, the entry **"Export GUI to flash drive "** is displayed in the table of contents. Upon this, a file is created for the GUI of the currently active address (currently located in the foreground) and stored on the flash drive. This is a memory-optimized format, so that a future transmission from the decoder does not take too long.

Loading self-made vehicle images:

A “configuration file” (as a “zsc” file; a sample is available from www.zimo.at, MX32 update page) must be created first and then copied together with the images to a flash drive.

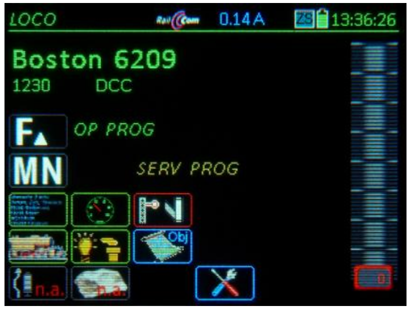
The configuration file must contain at least the red mandatory lines: [FileInfo], Content =Image.Loco, Version=03.02.0002, [/FileInfo], [Image], Id=**...** (the loco pictures) and the links File = 1|… and File = 2|… of the pictures (which must also be on the stick). The Id=… (max. 4-digit 1-9999) should be unique, otherwise a picture with the same ID would be replaced.

The "configuration file" is written in the Windows editor and saved as "…zsc" file (File / Save as / (file type "All files") / "...zcs" / Encoding "ANSI" / Save.

```
// Vehicle images                * Optional commentary lines
//
[FileInfo]
Content=Image.Loco               * * Content description of the following database
Version=03.02.0002               * Version of the loco data bank, 03.02.0002 requires SW 01.20.0150 in the MX32/FU
Date=2016.12.16                  * Date the dataset was created
Name=My loco pictures            * Name the loco database (all black entries are strings!)
[/FileInfo]
// ---------------------- P 8      * Optional comment line: Vehicle description
[Image]                  * Image opens
Id=1004                  * Unique image number (.bmp file), which must also be included in the image name.
Name=P8                  * Name (Type…) of the vehicle (is also shown in the MX32)
Engine=S                  * Attribute “Propulsion”, for display and as a filter for image selection in the MX32
                                                        (S=Steam, E=Electro, D=Diesel)
Country=DE                * Attribute “Country“, for display and as a filter for image selection in the MX32
Company=KPEV              * Attribute “RR-Company“, for display and as a filter for image selection in the MX32
Epoch=1                   * Attribute “Era“, for display and as a filter for image selection in the MX32
Gauge=N                   * Attribute “Gauge”, for display and as a filter for image selection in the MX32
Author=Peter M.           * Attribute “Author“, for display and as a filter for image selection in the MX32
PartNum=M37031            * Attribute “Manufacturer and article number” (M: Märklin, R: Roco ...)

File=1|Loco 1004.01 P8 [M37031].bmp  * Link to small image (.bmp-File 150 x 50 px, 24 bit)
File=2|Loco 1004.02 P8 [M37031].bmp  * Link to large image (.bmp-File 279 x 92 px, 24 bit)
[/Image]                 * Image is closed
//
```

8. THE “E-SCREEN”



The "E-screen" is the menu page for different applications.

E-Key (from the ***LOCO*** or ***SWI*** mode)

→ *E-Screen* ▶

The meaning of the **E- Key** in this instance is not for “Escape” but for “**E**instellungen”, which is the German word for “Settings”.

The E-screen symbolically shows which "setting" each key leads to (application, operating status).

The key sequences E + ... have the following meaning:

E + F → ***OP PROG,***
Entry into Operational Mode programming for CV and address programming on the main track. See chapter “OP PROG”.

E + MN → ***SERV PROG,***
Entry into Service Mode programming for CV and address programming on the programming track. See chapter “SERV PROG”.

E + 1 → ***ADDR FUMT,***
Various settings for the GUI of each vehicle (this is NOT decoder programming), in particular the number of function keys. See chapter “ADDR: FUMT…”.

E + 2 → ***ADDR SPEEDO,***
Settings for the display speedo (Design, Range etc.). See Chapter “*ADDR: FUMT**…**“*.

E + 3 → ***ACC LIST,***
Displays a list of accessory addresses where turnouts and signals, connected to accessory decoders, can be operated from. See chapter “ACC LIST”.

E + 4 → ***ADDR IMAGE,***
Select or change a vehicle image. See chapter “*ADDR: FUMT**…**“*.

E + 5 → ***ADDR FUSY,***
Assignment of function symbols to the function keys, See chapter “*ADDR: FUMT**…**“*.

E + 7 → ***ROUTES,***
Setting of routes in connection with suitable dispatching programs (ESTWGJ, STP...).
No description in this manual.

E + 8 → ***StEin LIST,***
Displays a list of existing StEin modules for monitoring and actuating their connections, i.e. track sections (HLU, occupancy detection, short circuits), turnouts, inputs, signals…
See chapter “StEin LIST”.

E + 9 → ***AOS‘s,***
not yet implemented and therefore no description.

E + 0 → ***CONFIG***
SW-Version information, as well as viewing and changing of the command station settings and the "own device" settings (i.e. the present controller): language, time & date, stop mode modifications, operating details, statistics and much more. See chapter “CONFIG” (formerly “CAB CONF”).

For details go to chapter ***ADDR … FUMT, SPEED, IMAAGE, FUSY; OP PROG; SERV PROG; SWI***

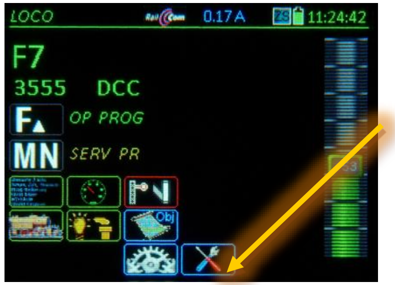
9. CONFIG Info and Settings for Command Station and Controller

E-Key (to the E-Screen) + F0-Key (number key 0) ➞ Entry to ***CONF*** from the ***LOCO*** or ***SWI*** mode

NOTE: the screen content shown here may not match exactly the actual appearance on the controller display, because it is permanently developed.

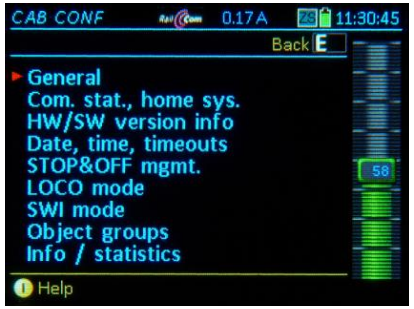
E

→



Key 0
= CONFIG

→



```
CAB CONF        0.17A   11:30:45
                         Back E
▸General
 Com. stat., home sys.
 HW/SW version info
 Date, time, timeouts
 STOP&OFF mgmt.
 LOCO mode
 SWI mode
 Object groups
 Info / statistics
Help
```

Scrolling wheel ➞ Move to a specific line in the ***CONFIG*** menu
A-Key ➞ Enter the selected page
E- Key ➞ Return to the ***CONFIG*** menu page
E- Key ➞ Return to the operating mode ***LOCO*** or ***SWI***

Switch between the detail pages with:

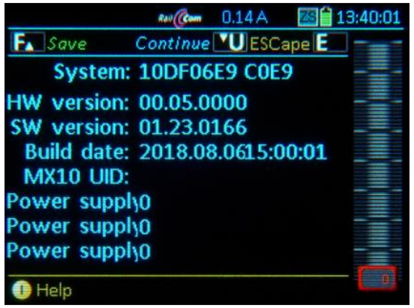
U- Key ➞ continuous to the next ***CONFIG*** screen
↑ (Shift) + **U- Key** ➞ returns to the previous page

Within a page:

Scrolling wheel ➞ move the cursor to the desired CONFIG line,
Rocker switch ➞ Select from available options
Number keys ➞ Enter a value

The new value will be saved as soon as you switch to another line with the A-, E-, U- Key or Scrolling wheel.

Command station – HW/SW Version Info



```
                0.14A   13:40:01
F Save     Continue U ESCape E
   System: 10DF06E9 C0E9
HW version: 00.05.0000
 SW version: 01.23.0166
  Build date: 2018.08.0615:00:01
  MX10 UID:
Power supply0
Power supply0
Power supply0
Help
```

HW-Version: Version of the MX10 (MX10EC) board

SW-Version: Software Version installed

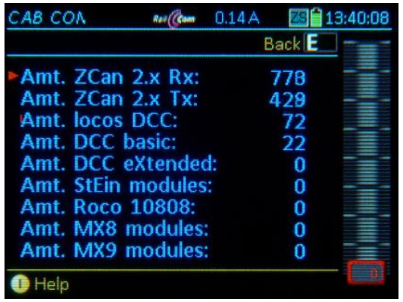
Build Date... Time: Software development date

MX10 UID: Factory serial number

Power supply ?????????????

.

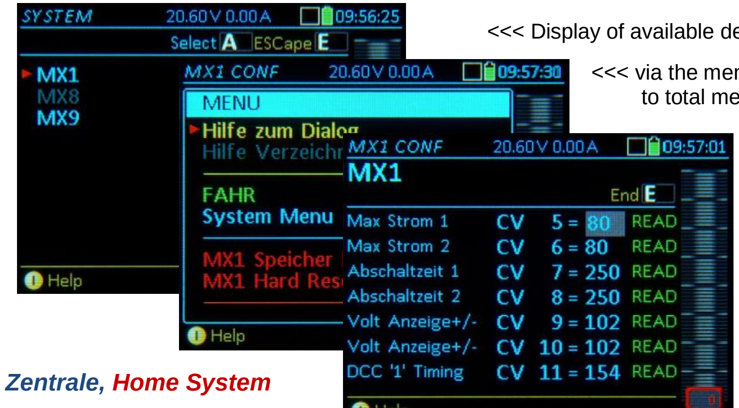
Command station - Statistics



```
CAB CON         0.14A   13:40:08
                         Back E
▸Amt. ZCan 2.x Rx:      778
 Amt. ZCan 2.x Tx:      429
 Amt. locos DCC:         72
 Amt. DCC basic:         22
 Amt. DCC eXtended:       0
 Amt. StEin modules:      0
 Amt. Roco 10808:         0
 Amt. MX8 modules:        0
 Amt. MX9 modules:        0
Help
```

Various current data regarding communication and devices connected to the command station.

CONFIG with the "old" command station MX1 (MX1EC; MX1HS)



```
SYSTEM       20.60V 0.00A   09:56:25
        Select A  ESCape E
▸MX1
 MX8
 MX9
Help
```

```
MX1 CONF     20.60V 0.00A   09:57:30
MENU
▸Hilfe zum Dialog
 Hilfe Verzeichn
FAHR
System Menu
MX1 Speicher
MX1 Hard Res
Help
```

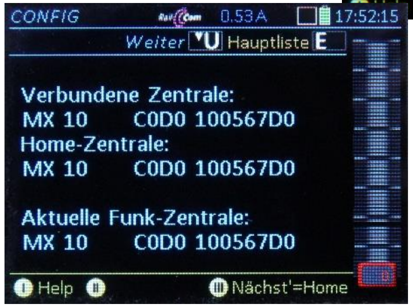
```
MX1 CONF     20.60V 0.00A   09:57:01
MX1
                              End E
Max Strom 1      CV   5 =  80  READ
Max Strom 2      CV   6 =  80  READ
Abschaltzeit 1   CV   7 = 250  READ
Abschaltzeit 2   CV   8 = 250  READ
Volt Anzeige+/-  CV   9 = 102  READ
Volt Anzeige+/-  CV  10 = 102  READ
DCC '1' Timing   CV  11 = 154  READ
```

<<< Display of available devices

<<< via the menu (M-Key)
to total memory erase and
Hard Reset

<<< CV-programming of
command station MX1

Zentrale, Home System



```
CONFIG          0.53A   17:52:15
     Weiter U Hauptliste E

 Verbundene Zentrale:
 MX 10      C0D0 100567D0
 Home-Zentrale:
 MX 10      C0D0 100567D0

 Aktuelle Funk-Zentrale:
 MX 10      C0D0 100567D0
Help  II         III Nächst'=Home
```

Verbundene Zentrale: MX10 (gilt auch für MX10EC), MX1, Z21, .. (sind nicht als Home-Zentrale geeignet)
ID wird angezeigt

Home-Zentrale: MX10 (gilt auch für MX10EC),
ID wird angezeigt

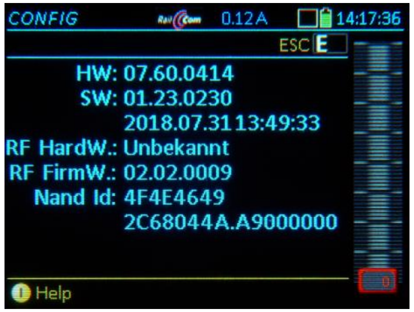
Aktuelle Funk-Zentrale: MX10 (gilt auch für MX10EC),
die mit dem Fahrpult per MiWi kommuniziert
ID wird angezeigt (diese müsste
gleich sein mit zuletzt per Kabel
verbundener Zentralen-ID)

Softkeys zur Auswahl des Home-Systems:

II (Verb' =) Aktuell verbundenes System soll
Home-System werden (wenn es nicht schon ist)
III (Nächste = Home) Nicht die aktuell angeschlosse
Zentrale (z.B. vor Auslieferung, bei Service
oder) Vorfphrung) soll Home-System bleiben, ndern
die beim nächsten Power-ON angeschlossene, .

Änderungen der **GUI-** und **FUMZ-Daten** am Fahrpult werden im zentralen Speicher des ***Home-Systems*** automatisch mitgeschrieben (siehe Kapitel „GUI") Beim Aufruf der Adresse werden Daten aus ***Home-Systems*** übernommen. (Beides zutreffend wenn angeschlossen)

This Controller - HW/SW Version Info



HW: 07.60.0414
SW: 01.23.0230
2018.07.31 13:49:33
RF HardW.: Unbekannt
RF FirmW.: 02.02.0009
Nand Id: 4F4E4649
2C68044A.A9000000

Name: default “MX32“; a new unique name for the controller can be entered here

Language: Selection of the languages available in this device (loaded from the flash drive or already present in the controller). Currently German / English.

Style: System and function symbols come in four different styles (see chapter “Styles”); two can be loaded in to the controller and are available here for selection.

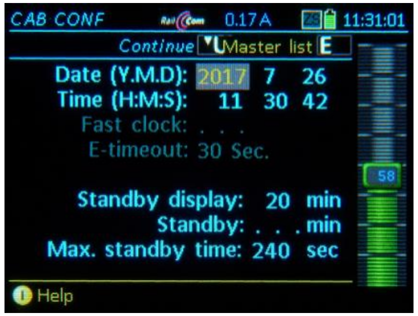
UID: factory-assigned serial number (Read-only)

HW: Hardware Version (Read-only),

SW: Software Version with Date (Read-only)

RF HW/FW: SW Version Radio (Read-only)

This Cab – Date, Time, Timeouts



Date (Y.M.D): 2017 7 26
Time (H:M:S): 11 30 42
Fast clock: . . .
E-timeout: 30 Sec.
Standby display: 20 min
Standby: . . . min
Max. standby time: 240 sec

HINWEIS: Die im MX32 eingestellte (lokale) Uhrzeit wird nicht vom MX10 übernommen und nach einem Neustart des MX32 auch nicht mehr angezeigt, Die im MX10 eingestellten Parameter werden über den CAN2 Bus an das MX32 gesendet.

Date (Y.M.D): The date for the internal calendar in the controller
(NOT the system’s clock, see MX10 manual).

Time (H.M.S): Internal clock setting
(NOT the system’s clock, see MX10 manual).

Fast clock: Acceleration factor compared to real time.

E-Timeout: The time the controller remains in the E menu page after pressing the **E-Key** (from the ***LOCO*** or ***SWI*** mode) before the screen returns to the previous page if no further selection is made.

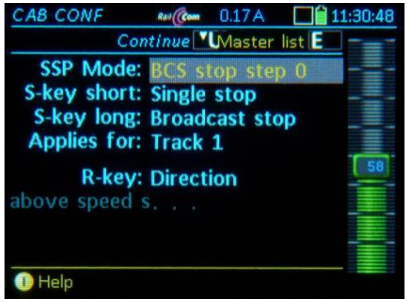
Screen Saver: A **screen saver** is activated after the controller sits idle for the time entered here: Name and address number moves randomly around the screen.

Idle standby: Only useful when the controller is operated in **radio mode**: if the controller sits idle for the time specified here, a special **stand-by screen** opens with a clock counting down the seconds until shutdown (see “Stand-by time”).

Standby-time: Time in seconds for the timer in the stand-by screen *) to count down to 0. During this time the controller can be returned to normal operation
(by pressing the **A-Key**) without going through the boot-up sequence.

*) The Stand-by screen appears when power is lost (i.e. cable unplugged) or when the cab sits idle while in the radio mode (in order to conserve battery power)

This Cab – STOP & OFF Management



SSP Mode: BCS stop step 0
S-key short: Single stop
S-key long: Broadcast stop
Applies for: Track 1
R-key: Direction
above speed s. . .

BCS Mode Type of Broadcast Stop (BCS)
= BCS emergency: Emergency broadcast stop
= BCS SS0: Normal broadcast stop **)

S-Key short = Single stop: Emergency stop for “your” engine
= Broadcast stop: Stops all engines per BCS mode

S-Key long = Broadcast stop: Stops all engines per BCS mode
= Track power OFF: Track 1 or track 1+2

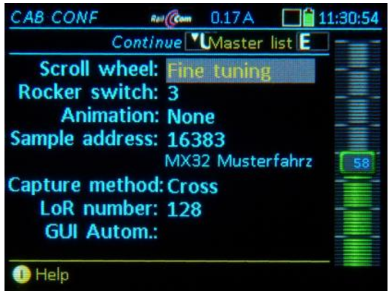
R-Key = Direction: Changes direction at any speed
= Single stop: Direction key initiates an emergency stop for “your” running engine; direction change only at stand-still (useful when S-Key = BCS).

Above speed step: The effect of the R-Key described above as a single stop key applies only above the speed step defined here (e.g. changes direction immediately at lower speeds).

NOTE: There is no track power “OFF” with the Roco Z21, only “STOPP” (as in broadcast stop per ZIMO terminology).

**) BCS (= Broadcast stop) applies to all engines but can be issued as emergency stops or “normal” stops (as programmed in CV #4). “Emergency” stops trains faster but may also cause derailments in tight curves; in such cases a non-emergency BCS would be better suited.

This Controller – Operating Mode LOCO



Scroll wheel: Fine tuning
Rocker switch: 3
Animation: None
Sample address: 16383
MX32 Musterfahrz
Capture method: Cross
LoR number: 128
GUI Autom.:

Scrolling wheel = Fine control: the speed (which is normally set with the slider) can be fine-tuned in small steps of +/- 10% of the selected speed steps (14/28/128).

= Vehicle selection: scrolling through the recall memory (***LoR***) with immediate activation even if the memory window is NOT visible *)

= No function.

*) The above selections are not valid when the recall memory (***LoR***) window is open, because the scrolling wheel is then used exclusively to scroll through the list (= for selecting a vehicle, but in this case also requires the **A-Key** to activate the address).

Rocker Switch= No Function.
= Fine control: the speed (which is normally set with the speed slider) can be fine-tuned in small steps of +/- 10% of the selected speed steps (14/28/128).
= Vehicle selection; scrolling through the recall memory (***LoR***) with immediate activation even if the memory window is NOT visible.

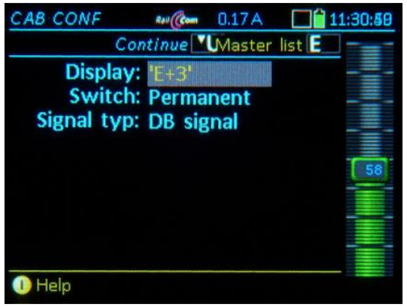
Sample Addr: Default 16383, although this is not a valid DCC address, it nevertheless serves as a sample address. Any (real) address can be used instead.

The settings of this sample address (function symbols, speedo etc.) are taken over for every new address that is activated via ***LOCO IN***.

If the sample settings are to be changed, activate the sample address like a real address and make the changes in the ***ADDR ….*** .

Animation = none: the function icons remain motionless
yes: the function icons are shown animated provided such images exist.

This Controller – Operating Mode SWI



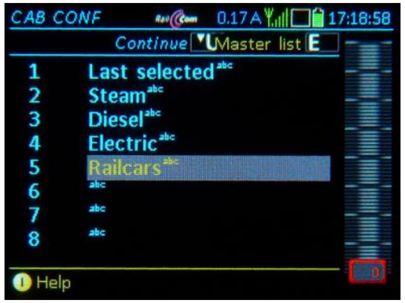
CAB CONF 0.17 A 11:30:58
Continue Master list E
Display: 'E+3'
Switch: Permanent
Signal typ: DB signal
Help

Display = Sequential numbers: a sequential number is shown above each switch icon (press the ↑(Shift)- Key to see the corresponding address).

= Addresses: the accessory address is shown above each switch icon (press the ↑ -Key to see the sequential numbers).

Switching = Keys + **Touch**: The accessories can be operated with the keyboard or the **touch screen**.
= **Touch**: Accessories with touch screen only. The function keys are available for normal loco functions. The shift key only works if a switch panel is active.

This Controller – Object Groups



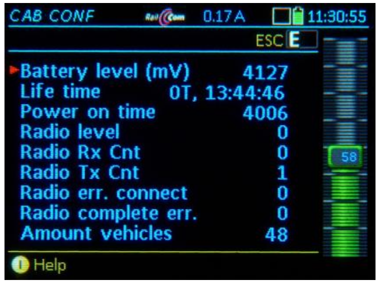
CAB CONF 0.17 A 17:18:58
Continue Master list E
1 Last selected
2 Steam
3 Diesel
4 Electric
5 Railcars
6
7
8
Help

Some "groups" (e.g., steam and diesel engines...) are

- already pre-defined (as shown), or
- can be defined here

and assigned to the objects (mostly vehicles), usually in the ***LOCO IN*** mode while a new address is assigned or modified.

This Controller – Info / Statistics



CAB CONF 0.17 A 11:30:55
ESC E
Battery level (mV) 4127
Life time 0T, 13:44:46
Power on time 4006
Radio level 0
Radio Rx Cnt 0
Radio Tx Cnt 1
Radio err. connect 0
Radio complete err. 0
Amount vehicles 48
Help

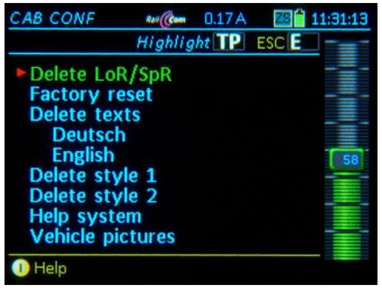
Battery status (mV): Shows the current charge level
= > 3.8 V (3800 mV): charging
= < 3.6 V (3600 mV): discharging

Life Time: Total operating hours since its first start-up.

Power On Time: in seconds; current operating time since the last power up.

Number of vehicles, panels, texts etc.: Each line lists the number of articles stored in the MX32 (i.e. locomotives, accessories, texts, labels, function icons, loco images…

This Controller – Clear Data



CAB CONF 0.17 A 11:31:13
Highlight TP ESC E
Delete LoR/SpR
Factory reset
Delete texts
Deutsch
English
Delete style 1
Delete style 2
Help system
Vehicle pictures
Help

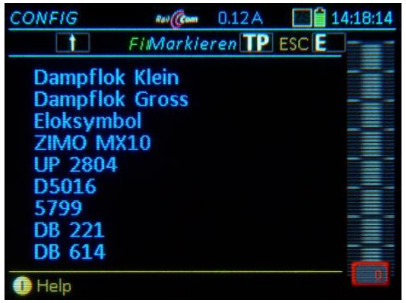
Various parts of the memory or data content can be deleted; this is usually not necessary;

ATTENTION:

Deleting certain items may negatively affect or destroy the functionality of the controller.

When selecting the line **"Vehicle Images"** in the **Clear Data screen**, the next steps will either

- delete ALL images, or
- when using one of the filters delete some groups of images (i.e. all steam engines).



CONFIG 0.12 A 14:18:14
↑ FiMarkieren TP ESC E
Dampflok Klein
Dampflok Gross
Eloksymbol
ZIMO MX10
UP 2804
D5016
5799
DB 221
DB 614
Help

10. LOCO IN, LOCO MOD, TRACK-ON SEARCH

LOCO IN is accessible

from the ***LOCO*** mode***:*** **A-Key** → ***LOCO IN***
from the ***SWI*** mode: **A- Key** → ***LOCO IN***
*from **LOCO** or **SWI** with* ↑ + A, if ***LoR*** is displayed (where A is used differently)

LOCO MOD is accessible

from the ***LOCO*** mode***:*** **A-Key + (repeat) A-Key** → ***LOCO MOD***
from the ***SWI*** mode***:*** **A-Key + (repeat) A-Key** → ***LOCO MOD***
*from **LOCO** or **SWI** with* ↑ + A, if ***LoR*** is displayed (where A is used differently)

LOCO is accessible
from most operating modes, including
LOCO IN: **F-Key** → ***LOCO*** (newly activated vehicle)

LOCO IN serves to **define** and **activate** a new **vehicle** by entering the address or by selecting an existing one from the Object Database

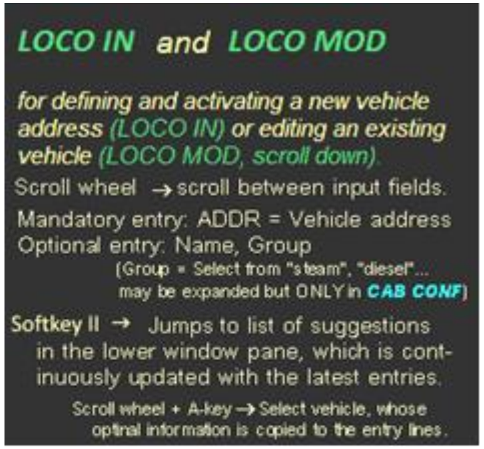
or

to **activate** an **accessory address!**

LOCO MOD serves for the modification or completion of the GUI (name and user interface) of an already activated vehicle. Display and procedure is the same as in ***LOCO IN!***

LOCO is the normal driving mode of the controller.

The Help-File for ***LOCO IN*** ▼ ▶



LOCO IN* and *LOCO MOD

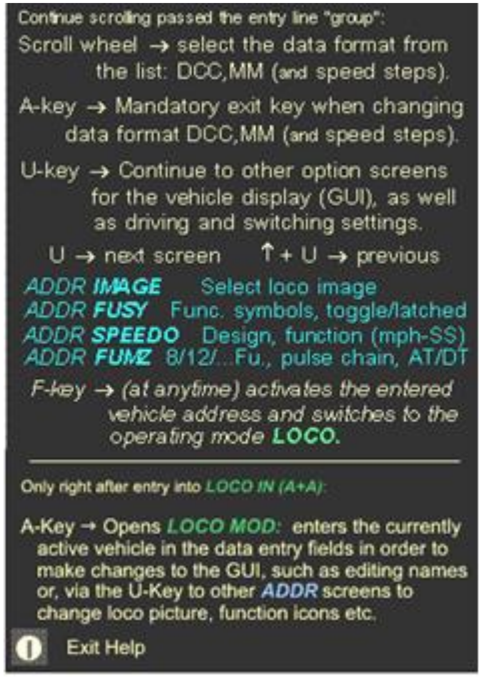
for defining and activating a new vehicle address (LOCO IN) or editing an existing vehicle (LOCO MOD, scroll down).

Scroll wheel → scroll between input fields.

Mandatory entry: ADDR = Vehicle address
Optional entry: Name, Group
(Group = Select from "steam", "diesel"... may be expanded but ONLY in **CAB CONF**)

Softkey II → Jumps to list of suggestions in the lower window pane, which is continuously updated with the latest entries.

Scroll wheel + A-key → Select vehicle, whose optinal information is copied to the entry lines.



Continue scrolling passed the entry line "group":
Scroll wheel → select the data format from the list: DCC,MM (and speed steps).

A-key → Mandatory exit key when changing data format DCC,MM (and speed steps).

U-key → Continue to other option screens for the vehicle display (GUI), as well as driving and switching settings.

U → next screen ↑ + U → previous

ADDR ***IMAGE*** Select loco image
ADDR ***FUSY*** Func. symbols, toggle/latched
ADDR ***SPEEDO*** Design, function (mph-SS)
ADDR ***FUMZ*** 8/12/...Fu., pulse chain, AT/DT

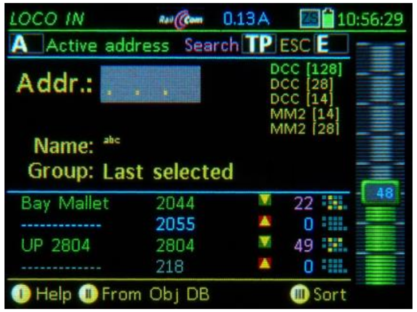
F-key → (at anytime) activates the entered vehicle address and switches to the operating mode **LOCO.**

Only right after entry into *LOCO IN (A+A)*:

A-Key → Opens *LOCO MOD:* enters the currently active vehicle in the data entry fields in order to make changes to the GUI, such as editing names or, via the U-Key to other *ADDR* screens to change loco picture, function icons etc.

Ⓘ Exit Help

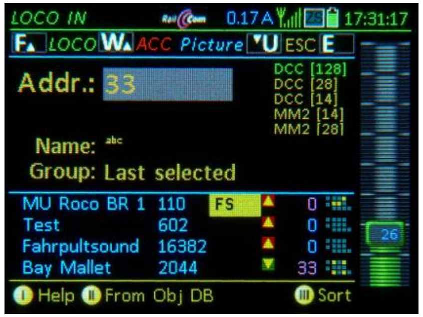
From ***LOCO***
A
→
or
↑ + A



Addr.: . . .
Name: abc
Group: Last selected

Bay Mallet	2044	▼	22
-------------	2055	▲	0
UP 2804	2804	▼	49
-------------	218	▲	0

Type in address
→
Confirm with A



Addr.: 33
Name: abc
Group: Last selected

MU Roco BR 1	110	FS	▲	0
Test	602		▲	0
Fahrpultsound	16382		▲	0
Bay Mallet	2044		▼	33

A-Key from ***LOCO*** or ***SWI*** ▲

*How to use **LOCO IN** to define and activate a new vehicle:*

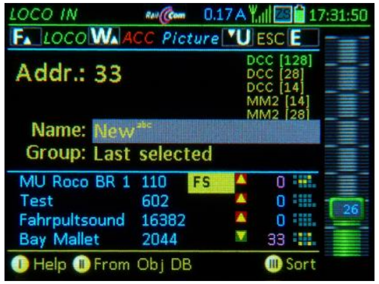
Enter address, name (optional), vehicle group (optional) and use the

A-Key → to accept (and open the next input field)

Scrolling wheel → scroll among the input fields (Address, Name, Group) and if the data format differs from default (DCC, 128 speed steps): Select the proper format from the list DCC, MM, (speed steps), **A-Key** → to confirm.

Rocker switch → select from the available options in the "Group" field (New entries are also possible).

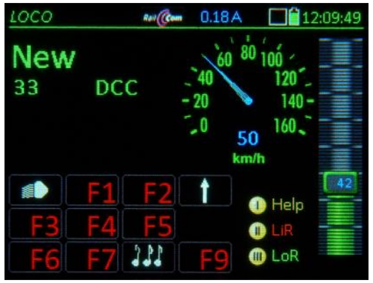
Enter name
→



Addr.: 33
Name: New abc
Group: Last selected

MU Roco BR 1	110	FS	▲	0
Test	602		▲	0
Fahrpultsound	16382		▲	0
Bay Mallet	2044		▼	33

F
→



While adding data in the upper half of the screen, an object list of already existing vehicles that match the entered data appears in the lower half of the screen. This list is of NO importance when simply entering a new address. See next page for more info on the object list on page 33 and 57!!

F-Key → activates the vehicle address and switches over to the ***LOCO*** (Driving) mode. The activation can happen at any time, either right after entering the address number or after entering an address name and/or locomotive group.

U-Key → If, in addition to the already entered data (address, name…), a vehicle image, function key icons, speedometer and more should be added (***ADDR***…screens); also activate directly with the F-Key as above.

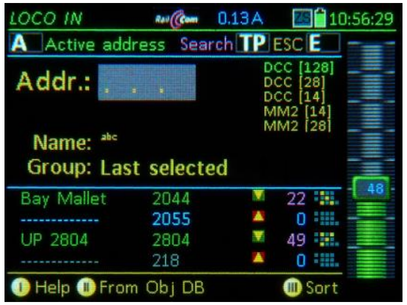
See chapter ***ADDR… FUMT, IMAGE, SPEEDO…*** about these screens and their entries.

E-Key → (= ESCape) Returns to the previous state without adding the new vehicle.

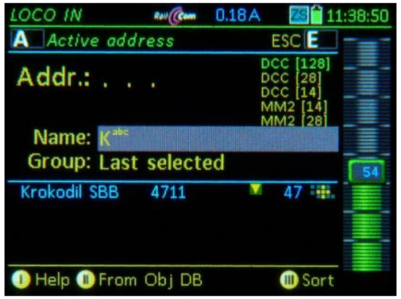
NOTE: All these GUI elements can be added to the object or edited later from the ***LOCO*** mode using the
E-Key + 1, 2, 4 … → ***ADR FUMT, SPEEDO, IMAGE***...
"**Cloning**"is often a labor-saving help with the GUI creation; see chapter "GUI …" !!!

How to use LOCO IN to activate an object from the Object-Database:

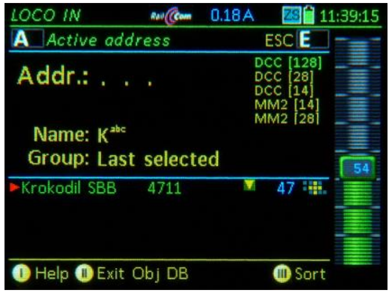
A


LOCO IN 0.13A 10:56:29
A Active address Search TP ESC E
Addr.:
DCC [128] DCC [28] DCC [14] MM2 [14] MM2 [28]
Name: abc
Group: Last selected
Bay Mallet 2044 22
------------ 2055 0
UP 2804 2804 49
------------ 218 0
Help From Obj DB Sort
48

(repeat) A
(so: A+A)


LOCO IN 0.18A 11:38:50
A Active address ESC E
Addr.: . . .
DCC [128] DCC [28] DCC [14] MM2 [14] MM2 [28]
Name: K abc
Group: Last selected
Krokodil SBB 4711 47
Help From Obj DB Sort
54

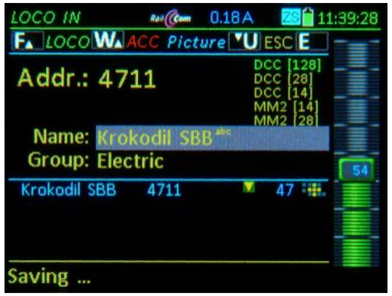
Softkey II


LOCO IN 0.18A 11:39:15
A Active address ESC E
Addr.: . . .
DCC [128] DCC [28] DCC [14] MM2 [14] MM2 [28]
Name: K abc
Group: Last selected
Krokodil SBB 4711 47
Help Exit Obj DB Sort
54

Type the first digit(s) of the address number and/or the first characters of the loco name:

The lower display half shows the object list, which continuously adapts to the input. The object list is an excerpt of the controller’s object database (**ObjectDB**). Only objects are listed that specifically match their address number and/or names to the already entered digits and characters in the upper half of the ***LOCO IN*** display

A


LOCO IN 0.18A 11:39:28
F LOCO W ACC Picture U ESC E
Addr.: 4711
DCC [128] DCC [28] DCC [14] MM2 [14] MM2 [28]
Name: Krokodil SBB abc
Group: Electric
Krokodil SBB 4711 47
Saving ...
54

green lines – Objects in the ***LoR*** memory of this controller (including the currently active loco)

blue lines – in **ObjDB (Object-Database)** of this controller but not the ***LoR*** memory

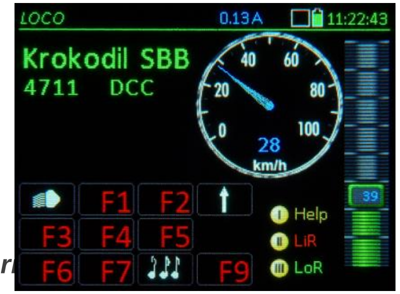
gray lines – in **Object-Database** of the command station, but NOT in this controller

Softkey II → Switches to the Object **list** (lower display half) for scrolling through objects

Softkey III → Sorting of the Object list in three ways: Enter type (green, blue...), address or names.

Softkey II, **scrolling wheel**, **A-Key** → Mark and select a vehicle from the object list; this vehicle will then be moved to the upper input fields…

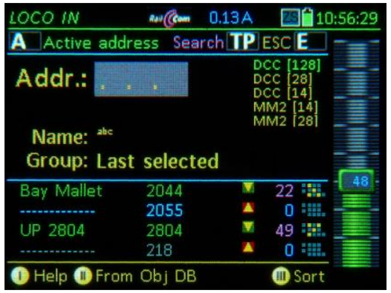
F-Key → activates the vehicle and switches back to the ***LOCO*** mode.

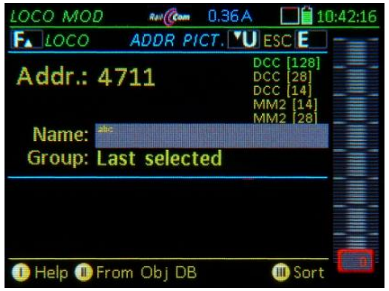

LOCO 0.13A 11:22:43
Krokodil SBB
4711 DCC
28 km/h

How to use the LOCO MOD to modify the curr

From ***LOCO*** or ***SWI***

A


LOCO IN 0.13A 10:56:29
A Active address Search TP ESC E
Addr.: . . .
DCC [128] DCC [28] DCC [14] MM2 [14] MM2 [28]
Name: abc
Group: Last selected
Bay Mallet 2044 22
------------ 2055 0
UP 2804 2804 49
------------ 218 0
Help From Obj DB Sort
48


LOCO MOD 0.36A 10:42:16
F LOCO ADDR PICT. U ESC E
Addr.: 4711
DCC [128] DCC [28] DCC [14] MM2 [14] MM2 [28]
Name: abc
Group: Last selected
Help From Obj DB Sort

By pressing the A-Key twice (from ***LOCO*** or ***SWI***) the active vehicle is moved directly to the ***LOCO MOD*** screen: for editing the fields “Name” or “Group”.

U-Key → modify the object with respect to vehicle image, function key icons, speedo and more with the help of the ***ADDR…*** screens; Activation occurs thereafter directly from these screens. See chapter “***ADDR (FUMT, ICONS, SPEEDO…)”***, where all GUI elements are described.

F- Key → re-activation after quick editing, i.e. after changing or completing the name (normally though, the address is activated form the ***ADDR*** - screens).

ATTENTION: Modifications (in ***LOCO IN*** as well as ***LOCO MOD***) change the object in the command station and also in all other controllers; however, the old version remains in the **Object Database** of the own controller and allows the change to be reversed with the E key (until the object is removed from the ***LoR*** – at which time the **Object Database** is adapted.

How to use the LOCO IN mode for defining and activating an Accessory address:

Enter a **valid accessory address (1 … 511)**, WITHOUT name, WITHOUT group, and use the

W-Key → to activate the accessory address and switch to the operating mode ***ACC LIST***, directly to the new address, to immediately operate turnouts on this address.

Exit the ***ACC LIST*** with **Softkey II.**

More info about object modifications (GUI-elements): see chapter *ADDR FUMT, SPEEDO…* (last page: “*GUI and Copy GUI*)

More information about obtaining GUI elements by "cloning" known vehicles: see chapter Saving **GUI** (**G**aphical **U**ser **I**nterface), Handover / Takeover, “Cloning“

The “TRACK-ON SEARCH”

requires system SW 01.24.0001 and decoder SW 37.16 or higher

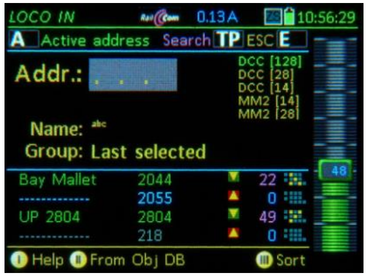
The "TRACK-ON SEARCH" is a procedure to determine a previously unknown address of a vehicle placed on the layout track. Gradually, along with the feature "Load GUI from the decoder into the controller" it is being developed into a comprehensive "Registration System".

Detect and operate a vehicle with unknown DCC address

- **Remove power to the vehicle for about 2 seconds** by tilting it; or place a **new vehicle on the track.**
- **A-Key** (or, ↑ + **A- Key** with *LoR* open)

  → Switches to ***LOCO*** or ***LOCO IN***, ▶

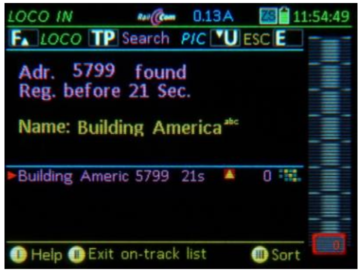
  The lower half of this screen displays the list of objects, which will be replaced by the “Track-On Search” list once the search is started.



Addr.: . . .
Name:
Group: Last selected
Bay Mallet 2044 22
2055 0
UP 2804 2804 49
------------- 218 0

↓ TP

- **TP- Key** (SEARCH) → **Searches for the address** of the new vehicle on the track; all decoders that were placed on the track within the last minute (= power-up) are prompted to send a message via Railcom (no matter if placed newly on the track or only briefly tipped), which will be registered by the system.
- **The address found will be displayed**; if it is a known address already in the object databank and has a name attached to it, the name will be shown in the field below. ▶

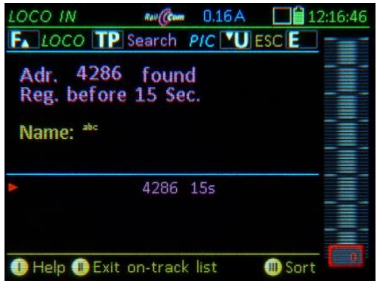


Adr. 5799 found
Reg. before 21 Sec.
Name: Building America
Building Americ 5799 21s 0

or

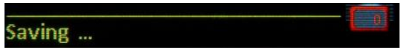
This address is also shown in the **lower half of the screen,** as follows

- if the **address is already in the system**, it shows the name (or alternatively ----), direction (arrow), speed step and the first function table (all taken from the object databases).
- if it is a **completely new address** (neither in the object database of the controller nor the command station), the only info that can be shown is the address and the reporting time. ▶



Adr. 4286 found
Reg. before 15 Sec.
Name:
4286 15s

- **F- Key** → Saves the new found address and switches over to the ***LOCO*** mode. ▼



Saving ...

If the search (TP key) shows several addresses at (almost) the same time…

- **A- Key** … as described before.
- **TP- Key** (SEARCH) … as described before.
- If several decoders power-up within the one-minute search time, and therefore all report themselves as “newly-added”, they will all be displayed in the lower half of the screen ("Track-On list"); ▶

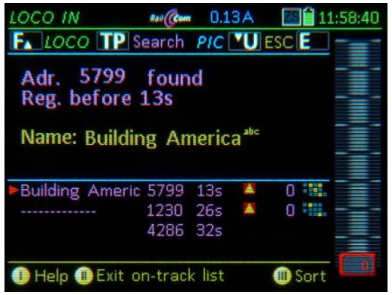
  This occurs:

  when other decoders, than the one to be identified, **coincidentally lose contact** and are therefore regarded as “newly added”, or…

  when several vehicles are indeed placed on the layout and **all report at the same time**, or…

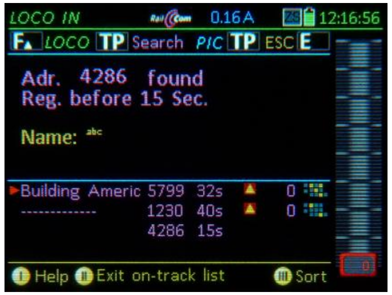
  when the “Track-On” search (**TP-Key**) is started **within one minute** of applying track power (by powering up the command station or cancelling a short circuit on the track).

  The “Track-On” list, which also holds the initially searched address (displayed in the upper field), also contains data such as speed and the first function table for vehicles already in the system.



Adr. 5799 found
Reg. before 13s
Name: Building America
Building Americ 5799 13s 0
------------- 1230 26s 0
4286 32s

▶



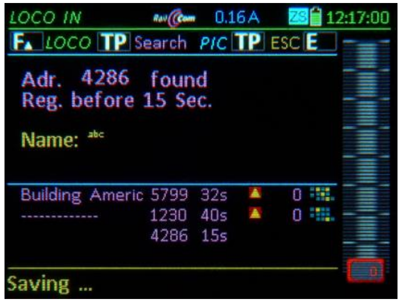
Adr. 4286 found
Reg. before 15 Sec.
Name:
Building Americ 5799 32s 0
------------- 1230 40s 0
4286 15s

Switch to the operating mode ***LOCO*** with the:

- **F- Key** → Driving with the reported (“…found”) address.

or

- **Scrolling wheel** and **A- Key** → Select another address from the “Track-On” list; the selected address is moved to the upper line (…found). ▶



Adr. 4286 found
Reg. before 15 Sec.
Name:
Building Americ 5799 32s 0
------------- 1230 40s 0
4286 15s
Saving ...

- **F- Key** → Activates the selected address.

Address conflict; Track-On search finds two identical addresses

An address conflict exists if an address is found during the Track-On search that is already used by another vehicle in the object database of the system, or if two vehicles with the same address report themselves during the search procedure.

Then a distinction is made on the basis of the **decoder UID**, a 4-byte number in CVs #250 - #253, which is automatically read out for this purpose. Each UID is unique and can occur only once.

The Track-On list then displays several lines - in this case also those that are not from the Track-On search, but the object database - each with reference to the different UID. The user then has the option of changing the address on one of the vehicles, or deleting obsolete entries in the object database.

.

Image follows later

DETAILS UND SCREENSHOTS WILL BE ADDED WITH THE IMPLEMENTATION OF THIS FEATURE

Recognition and registration of all addresses located on the layout

- **Turning off** track power (i.e. track power OFF with **S + TP-Key**, deliberate short circuit or pulling the track connection) and **subsequent re-power.**
- Within the first minute after restoring track power (or after powering up the system):
  Initiate a **Track-On search**, as described above with the **A-Key** (or ↑ + A) in ***LOCO IN***, **TP-Key** (SEARCH),
- All vehicles (equipped with appropriate decoders) report themselves and will be shown in the Track-On list.
- This information can be used by the user as needed.

> **ATTENTION:** The current software is limited to a maximum of about 5 vehicles / addresses;
> List evaluations (i.e. automatic transfer to the LoR) are not yet implemented.

NOTES about FUTURE DEVELOPMENT PLANS of the TRACK-ON SEARCH:

For a **complete vehicle registration** on the layout (or the DCC system), an automatic adoption of the “GUI” from the vehicle or an external databank must be included.

The integration of the MX32-GUI into sound projects is planned so that the "GUI data" can be downloaded via RailCom from the decoder into the system (or the controllers) or - for cases where this is not possible – to copy the GUI from the sound database on the ZIMO website.

This GUI data download can optionally be made immediately after the Track-On search in the Track-On list or independent thereof (at any time) from the operating mode ***LOCO***.

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11. ADDR…*FUMT, SPEEDO, IMAGE, FUSY – GUI*

***Settings** to the stored **GUI-Displays, Icons, Pictures** in the system (Command station, controllers)… for the current address*

All settings that are used for the operation of a vehicle (= address) and its representation in the controller display, which is the **"Graphical User Interface"** (= GUI), are made here through various setup screens: ***ADDR FUMT, ADDR SPEEDO, ADDR IMAGE*** and ***ADDR FUSY.***

However, this is **NOT** about programming parameters **IN** the decoder, but rather programming the system (controller or command station) **FOR** the vehicle, which includes the **user interface** or **"GUI"**.

ADDR FUMT, SPEEDO… can be reached

either

- in continuation of ***LOCO IN*** or ***LOCO MOD*** – i.e. after entering or editing an address and name (but before activating it) – with the **U-Key**, which opens the first setup screen, in this case the ***ADDR IMAGE.*** Beyond this point use the U-Key to advance to the next setup screen in the order of ***FUSY, SPEEDO, FUMT***

or

- for the currently active address in the ***LOCO*** or ***SWI*** mode with the with the **E-Key** + numeric keys 1 / 2 / 4 / 5 ➞ to the corresponding setup screens ***ADDR FUMT*** / ***ADDR SPEEDO*** / ***ADDR IMAGE*** / ***ADDR FUSY***.

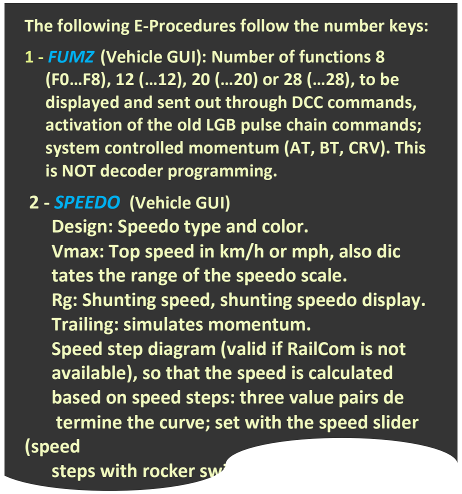
In each setup screen the:

Softkey II ➞ copies the current CVs to the clipboard
Softkey III ➞ pastes the data from the clipboard

F- Key ➞ **exits** the ***ADDR*** – section and stores the new settings, *or*

E- Key ➞ **ESCapes** from the ***ADDR*** – section and keeps the old settings**.**

Help-File for ***ADDR … FUMT, SPEEDO...*** ▶

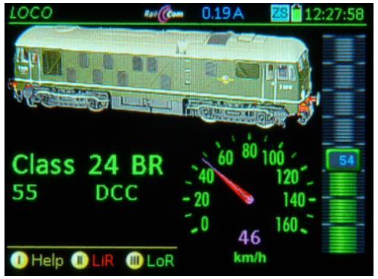


The following E-Procedures follow the number keys:

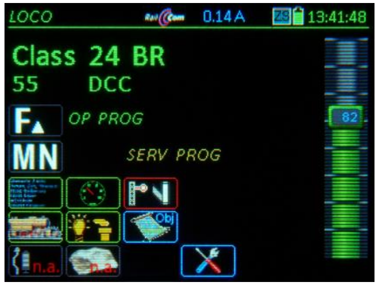
1 - *FUMZ* (Vehicle GUI): Number of functions 8 (F0…F8), 12 (…12), 20 (…20) or 28 (…28), to be displayed and sent out through DCC commands, activation of the old LGB pulse chain commands; system controlled momentum (AT, BT, CRV). This is NOT decoder programming.

2 - *SPEEDO* (Vehicle GUI)
Design: Speedo type and color.
Vmax: Top speed in km/h or mph, also dic tates the range of the speedo scale.
Rg: Shunting speed, shunting speedo display.
Trailing: simulates momentum.
Speed step diagram (valid if RailCom is not available), so that the speed is calculated based on speed steps: three value pairs de termine the curve; set with the speed slider (speed steps with rocker sw

The "before" screen (starting point for this example)



E



E-Key ➞ from ***LOCO*** to the "E" menu screen for further selection

Keypad (after E) ➞ open the corresponding setup screen (1, 2, 4, 5, *see below*); each individual setup screen can be processed on its own (and terminated with the F-Key, which also stores the settings) or continue to other setup screens with the **U-Key**.

The following applies to each of these setup screens:

F- Key ➞ closes ***ADDR…***, activates the address and switches over to the ***LOCO*** mode; this is possible at any time within **ADDR...,** whereby all settings made in the meantime (on the setup screens that have been opened successively with the **U-key**) are saved.

ATTENTION: The **only way** to **save the new settings** is by activating them with the **F-Key**; using the **E-Key** instead deletes the new settings (of all set-up screens that were opened and edited before with the U-Key).

E- Key ➞ exits ***ADDR …*** (without saving), returns to the previous state,

U- Key ➞ advances to the next setup screen, which in the case of ***ADDR IMAGE*** is ***ADDR FUSY*** and so on to the other screens.

↑ (Shift) + **U- Key** ➞ returns to previous screen.

For more information about object-GUI's
and their management in command stations and controllers,
see the chapter: "*GUI and Copy GUI"*

E + 1 → ADDR FUMT **–** Various settings for engine control

Function Mode (FUM): The number of functions the command station should send,

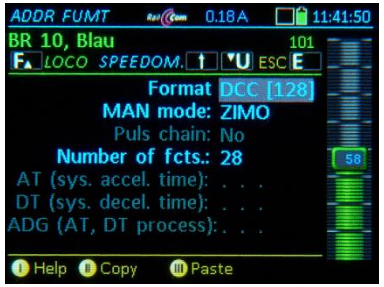
8A: the "old" 8-function mode (ZIMO decoders before 2003 that used more than 4 functions)
8: only 8 functions are sent and displayed
12: 12 functions
20: 20 functions
28: 28 functions (all as per NMRA)
If this number of functions is defined incorrectly, only the (lower) number of F-keys will appear in the ***LOCO*** screen.

Pulse chain: for very old LGB decoders ("serial" function switching); which operates up to 8 function outputs by automatically switching F1 ON and OFF multiple times.

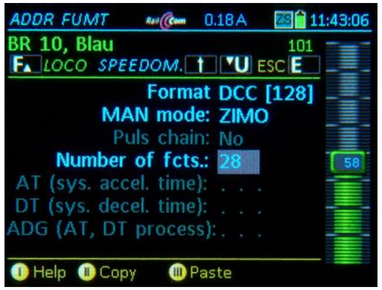
AT, BT: System-controlled acceleration times (0 … 15); these two values are often used just temporarily, in addition to the decoder acceleration and deceleration times (CV #3, 4).

CRV: Curvature variations to AT, BT (currently not implemented)

after E: 1 or from ***FUSY***: U


ADDR FUMT 0.18A 11:41:50
BR 10, Blau 101
LOCO SPEEDOM. ESC E
Format DCC [128]
MAN mode: ZIMO
Puls chain: No
Number of fcts.: 28
AT (sys. accel. time): . . .
DT (sys. decel. time): . . .
ADG (AT, DT process): . . .
Help Copy Paste

Scroll to set-tings →


ADDR FUMT 0.18A 11:43:06
BR 10, Blau 101
LOCO SPEEDOM. ESC E
Format DCC [128]
MAN mode: ZIMO
Puls chain: No
Number of fcts.: 28
AT (sys. accel. time): . . .
DT (sys. decel. time): . . .
ADG (AT, DT process): . . .
Help Copy Paste

> NOTE: **RG-Key** – **Shunting:**
> Pressing the key 1x = Yellow RG-LED: speed range is cut in half (64 instead of 128 steps).
> Pressing the key again: 1/3 of actual speed (42 instead of 128 steps).
> Pressing the key again: returns to normal operation (- 128 speed steps).

An active shunting operation ends automatically when switching to the CV screen (*OP PROG* or *SERV PROG*).

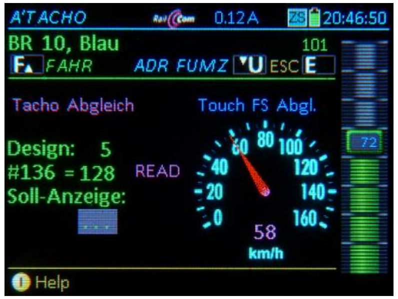
> NOTE: The speedo display with the blue pointer of a controller that wants to overtake a loco address from an active controller may update the speed with a time lag, as the display is not refreshed until the MX10 sends a speed step command. There is no such delay with a RailCom speedo, since the speed is refreshed based on the decoder feedback.

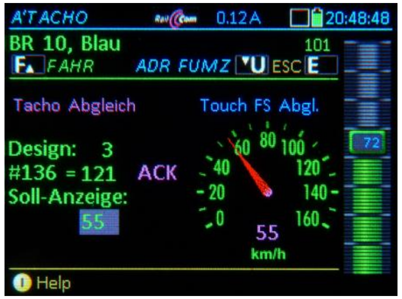
E + 2 → ADDR SPEEDO **–** Speedometer settings

The speedometer can display two fundamentally different types of speeds:

1) Speedometer display based on RailCom feedback (magenta-colored pointer): the calibration of this feedback takes place in CV #136. By pressing **E-key** + **2** you get to the "RailCom speedo adjustment" screen (right picture). There are two setting options here:
   - **Design**: different "Speedo Dials" (different colors, representations, km/h or mph) can be selected with the function keys or the scrolling wheel. Confirm with: **F-Key**.
   - **Target-Speed** (only when driving): The speedometer reading can be corrected here by entering a different speed. Confirm with the **A- Key**.
   - **Tapping** on the speedometer face leads to the adjustment screen for "speedometer adjustment without RailCom feedback".

> NOTE: If the feedback fails, the calculated speed (blue pointer) is used again.


A'TACHO 0.12A 20:46:50
BR 10, Blau 101
FAHR ADR FUMZ ESC E
Tacho Abgleich Touch FS Abgl.
Design: 5
#136 = 128 READ
Soll-Anzeige: . . .
58 km/h
Help


A'TACHO 0.12A 20:48:48
BR 10, Blau 101
FAHR ADR FUMZ ESC E
Tacho Abgleich Touch FS Abgl.
Design: 3
#136 = 121 ACK
Soll-Anzeige: 55
55 km/h
Help

2) Speedometer display without RailCom feedback (blue pointer): the speed is calculated from the speed steps. For a meaningful display, the speed steps must be matched to the km-value for each vehicle; using the curve diagram with the four adjustable points (see below for details). The following points can be changed:

Design: various "speedo faces". Confirm with the **F-Key**.

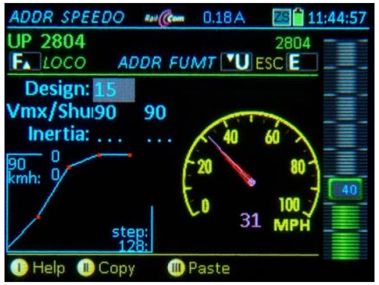
Vmx: defines the "maximum" speed of the speedo dial, currently 4 different Vmax. scales.

Rg: selecting "shunting" switches over to the "shunting-speedo" dial.

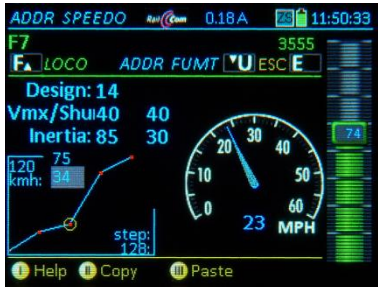
Trailing: The pointer movement is to trail behind the sent speed step commands (to imitate momentum); NOT ACTIVE with RailCom speed feedback.

Speed steps to speed mapping curve: (only while driving): depending on the set speed, a red dot is marked on the speed curve; In the upper value pair field, the current speed step is visible, in the lower field the (corrected) speed (km/h value) can be entered. The curve is changed accordingly. This can be repeated for the three (lower) speed points.

After E: 2 or from ***FUSY***: and 3

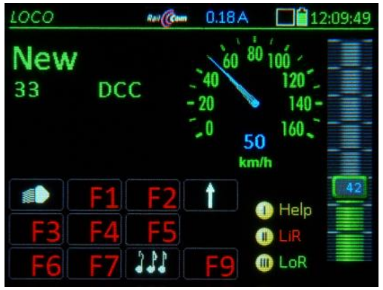

ADDR SPEEDO 0.18A 11:44:57
UP 2804 2804
LOCO ADDR FUMT ESC E
Design: 15
Vmx/Shu 90 90
Inertia: . . . . . .
90 kmh: 0 0
step: 128
31 MPH
Help Copy Paste

Select a design


ADDR SPEEDO 0.18A 11:50:33
F7 3555
LOCO ADDR FUMT ESC E
Design: 14
Vmx/Shu 40 40
Inertia: 85 30
120 kmh: 75 34
step: 128
23 MPH
Help Copy Paste

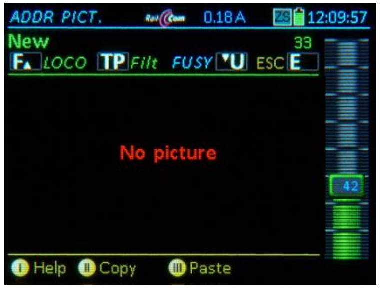
Correcting the speed curve

E + 4 → ADDR IMAGE – Selecting a vehicle image, for an active address that does NOT yet have an image assigned:



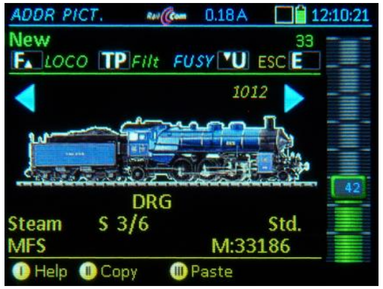
```
LOCO          0.18A   12:09:49
New
33     DCC
50 km/h
F1 F2 F3 F4 F5 F6 F7 F9
Help  LiR  LoR
```

E + 4 →



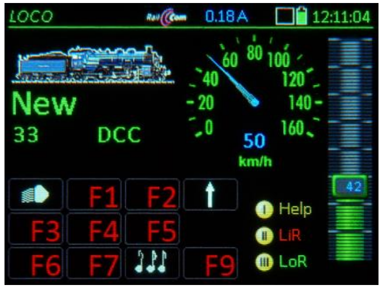
```
ADDR PICT.    0.18A   12:09:57
New                       33
F LOCO  TP Filt  FUSY U  ESC E
No picture
Help  Copy  Paste
```

Scroll →



```
ADDR PICT.    0.18A   12:10:21
New                       33
F LOCO  TP Filt  FUSY U  ESC E
1012
DRG
Steam    S 3/6          Std.
MFS                  M:33186
Help  Copy  Paste
```

F →



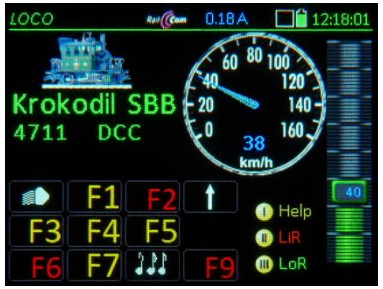
```
LOCO          0.18A   12:11:04
New
33     DCC
50 km/h
F1 F2 F3 F4 F5 F6 F7 F9
Help  LiR  LoR
```

Scroll through vehicle images; when desired image is found:

F-Key → activates the address with the selected image and switches to ***LOCO***; or

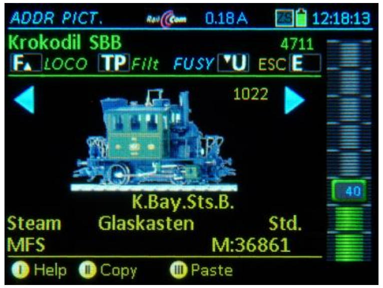
U-Key → advances to ***ADDR FUSY*** for function symbol assignments (the selected image will be saved during the subsequent activation with the F-Key).

If an image was assigned already to an active address (in the following example an obviously wrong image for a "crocodile type" engine):



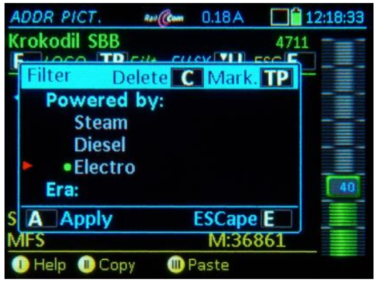
```
LOCO          0.18A   12:18:01
Krokodil SBB
4711   DCC
38 km/h
F1 F2 F3 F4 F5 F6 F7 F9
Help  LiR  LoR
```

E + 4 →



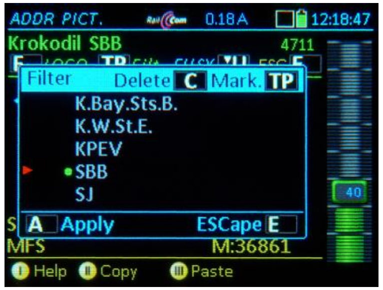
```
ADDR PICT.    0.18A   12:18:13
Krokodil SBB            4711
F LOCO  TP Filt  FUSY U  ESC E
1022
K.Bay.Sts.B.
Steam   Glaskasten      Std.
MFS                  M:36861
Help  Copy  Paste
```

TP →



```
ADDR PICT.    0.18A   12:18:33
Krokodil SBB            4711
Filter   Delete C  Mark. TP
Powered by:
   Steam
   Diesel
 • Electro
Era:
A Apply          ESCape E
MFS                  M:36861
Help  Copy  Paste
```

Scroll, TP →



```
ADDR PICT.    0.18A   12:18:47
Krokodil SBB            4711
Filter   Delete C  Mark. TP
   K.Bay.Sts.B.
   K.W.St.E.
   KPEV
 • SBB
   SJ
A Apply          ESCape E
MFS                  M:36861
Help  Copy  Paste
```

The previously selected image is the starting point for scrolling.

Attributes and filter:

Each image (if "properly" recorded) is associated with a number of "attributes": Engine type, country, company, locomotive name, author, etc.; these can be used as a filter and simplify the search in the comprehensive database, which often contains several hundred images:

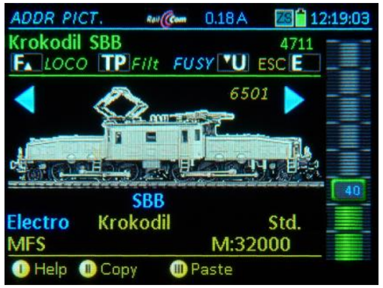
TP- Key → opens a filter definition window; in the window:

Scrolling wheel and **TP- Key** → mark one or several filter terms, which will be linked with an *and* command.

A- Key → exits the window and returns to the (now) filtered image collection.

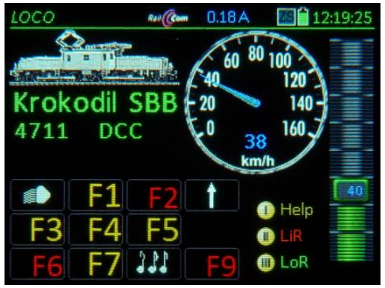
E- Key → cancels the filter effect for the current selection (the markings remain)

A, Scroll →



```
ADDR PICT.    0.18A   12:19:03
Krokodil SBB            4711
F LOCO  TP Filt  FUSY U  ESC E
6501
SBB
Electro   Krokodil      Std.
MFS                  M:32000
Help  Copy  Paste
```

F →



```
LOCO          0.18A   12:19:25
Krokodil SBB
4711   DCC
38 km/h
F1 F2 F3 F4 F5 F6 F7 F9
Help  LiR  LoR
```

E + 5 → ***ADDR FUSY*** – assigning function icons to function keys on the display: 10 function keys are displayed that can be replaced with the selected icons together with the latch/toggle function indicators by means of a green or red dot.

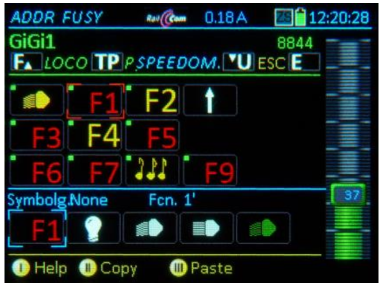
Function-Keys F0 …F9 → Marks (frame) the selected function key
↑ (Shift) → Switches to the next set of keys F10 … F19 etc.
Scrolling wheel → Scrolls through the list of available icons (bottom of page) and immediately applies them to the selected function key.

Rocker switch → jumps between icon groups in the list (i.e. light icons, sound icons…)
TP-Key → selects between latched/toggle (indicated by illuminated dot).

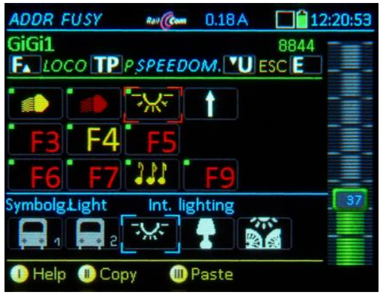
after E + 5

or from ***IMAGE***:

U



Fu-Key; scroll through icon list; TP-Key for latched/ toggle function; continue by pressing the next Fu-Key, etc.

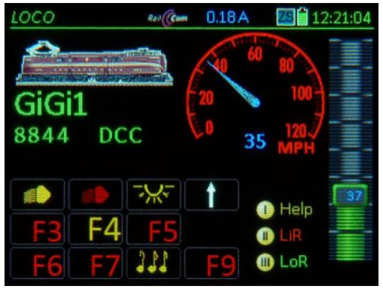


continue (with image, Fu-icons, speedo):

F-Key → Activates the address with the selected function icons and switches to operating mode ***LOCO*** ▶

or

U-Key → ***ADDR SPEED*** (Speedo set-up screen).



NOTE: It makes no difference whether each setup screen is saved separately with the **F-Key** or all settings are made first by advancing from one setup screen to the next with the **U-Key**, because all changes are saved with the “last” **F-Key**.

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12. GUI (*Graphical User Interface*) **back-up in the MX10** and **Handover/Takeover between devices**, **"cloning"** vehicles

The settings made on a MX32 controller with ***ADDR FUMT, ADDR SPEEDO, ADDR IMAGE, ADDR FUSY*** define the GUI (Graphical User Interface) and should also be available for other controllers. On the other hand, there are cases where an automatic GUI transfer is not desired, for example, when using the controller as a guest on another system.

Automatic or manual procedure:

Automatic – Save the GUI in the MX10:

Any changes to the GUI (i.e. the name and settings in ***ADDR FUMT, ADDR SPEEDO, ADDR IMAGE,*** and ***ADDR FUSY***) made on a MX32 controller will not only be stored in its local Object Database (***ObjDb***), and therefore also in the ***LoR***, but also transferred to the MX10, where it is stored in the systems database.

This is of course only the case if a MX10 command station is used (not with a Roco Z21 or an old ZIMO MX1 command station!).

Automatic – Takeover of GUI or GUI-Elements from the MX10:

When an address on a controller is activated that has NO GUI or an INCOMPLETE GUI (i.e. only some of the 5 GUI elements), regardless of whether it comes

from "External Control" or "Address in use" with the U-Key or
from "External Control" automatically (because the address is no longer "externally controlled") or
from the address input screen ***LOCO IN*** or
from the recall memory ***LoR*** or
from the object database ***ObjDB***,

the controller will take over the GUI or GUI-ELEMENTS automatically from the MX10.

These 5 GUI-ELEMENTS are: Name, FUMT values, Speedo, Image, Function Icons.

If, for example, a name is defined for an address on controller A but no function icons, and yet for the same address on controller B both name and function icons are defined, the function icons will appear on controller A also when the address is recalled, the name however is not changed.

Special provision for function icons: Those function keys which were still represented with a "substitute symbol" (F1, F2, F3, etc.) will, when the address is activated again, receive the function icons stored in the MX10 for that address, even if some of the function keys already had icons assigned.

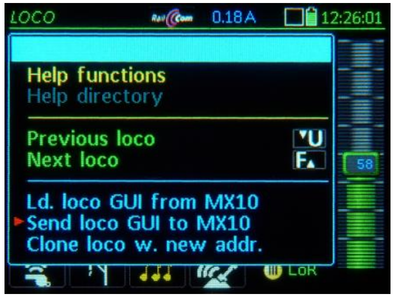
ATTENTION: A GUI Handover / Takeover while the MX32 operates in wireless mode can take a very long time (large amount of data). The MX32 should really be connected to the CAN bus with the CAN bus cable when GUI data is sent or received.
Only the ID of locomotive images or speedos will be transmitted, not the image itself.

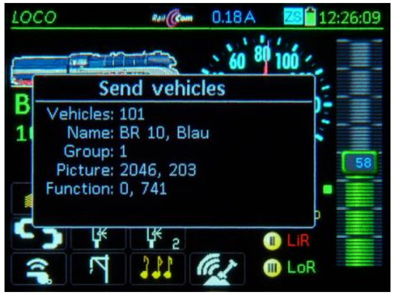
Manual Handover (saving the GUI in the MX10 via the menu):

M-Key ➞ Enter the menu from the operating mode ***LOCO***
Scroll to the line "Send vehicle GUI to MX10";

A-Key ➞ The GUI is sent to the MX10 and saved in its memory.

ATTENTION: the data is stored by address, that is, saving new data for the same address overwrites the old!





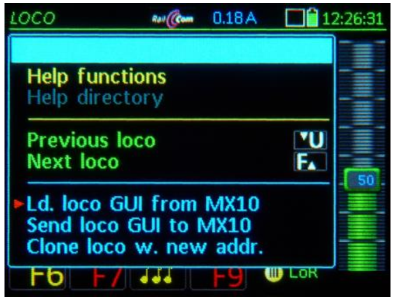
Send vehicles
Vehicles: 101
Name: BR 10, Blau
Group: 1
Picture: 2046, 203
Function: 0, 741

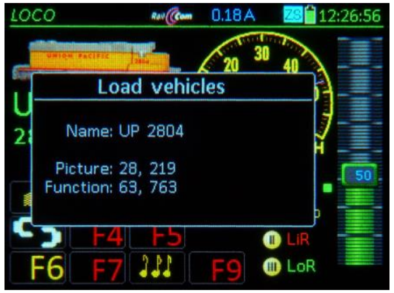
NOTE: saving via the menu is only necessary if it has not already been done automatically (by changing the GUI on a cab). For example, if the controller was connected to another command station or simply for reasons of safety.

Manual Takeover (importing the GUI from the MX10 via the menu):

M-Key ➞ Enter the menu from the operating mode ***LOCO***
Scroll to the line "Load vehicle GUI from MX10"; ";

A-Key ➞ The GUI will be taken over and displayed by the controller





Load vehicles
Name: UP 2804
Picture: 28, 219
Function: 63, 763

NOTE: This "manual" GUI takeover is always necessary if this controller already has its own GUI or GUI elements, and therefore new definitions made on another controller are not automatically taken over; but such a takeover is nevertheless desired.
The fact that not all controllers in the ZIMO system automatically receive the identical GUI for an address and immediately participate in all changes is sometimes not very comfortable. On the other hand, this allows the often desired option that two drivers can use the same address with different GUIs on their controllers (e.g.: with different names or images).

SW 01.25: and higher

Vehicle "cloning" (creating a new vehicle with the GUI of another)

"Cloning" means that the GUI (name, image, function icons...) of an address is copied to another address, so that two vehicles in the controller's database are identical in all attributes but the address is different.

"Cloning" always requires an **"origin"** (= the address with a GUI already defined) and
a **"clone"** (= the vehicle address this GUI is copied to).

Cloning saves a lot work when building a GUI, by exploiting the fact that there are often several of the same or similar engine types on the layout. With little difference between GUIs of two models, it makes sense to first "clone" the second engine from the first and then modify the GUI elements of the clone,

There are **two different clone operations** that can be called from the menu (using the **softkey M**) in the **operating mode *LOCO***; the clone window will then each have the appropriate heading: Cloning from active address

Origin Address 765 Clone .... Address 765 is an example only!

The **GUI** (name, picture...) **of the active address** ("origin") is thereby copied **to another address** ("clone"). In this case, the source address (the active address) is given; the other address, called a "clone", must be typed in; it may be a new address (not yet in the controller's database) or one already "in use" (already in the controller's database).

or Cloning from ObjDB Origin

Origin Address .... Clone 567 Address 567 is an example only

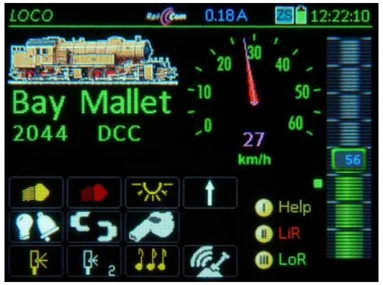
The **GUI** (name, picture...) **of an existing address** ("origin") is copied **to the active address**. In the second line of the window, that existing address is typed in as the source address (Origin). The destination address, which is referred to as "clone" (although not quite correct, because it already exists) is given (***LOCO*** address).

In both cases, a name for the "clone" is proposed in the clone window, this is a variant of the original name with a "2" added (or consecutive number), which can be overwritten immediately (still in the same window) with the desired name:

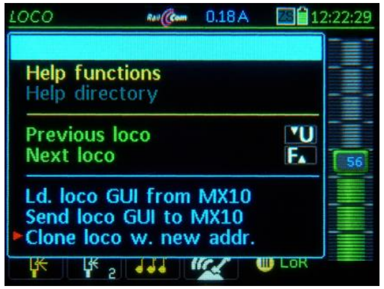
Origin Name Crocodile "Crocodile" is only an example
Clone Name Crocodile (2)

"Cloning" is available from the menu in the ***LOCO*** mode:

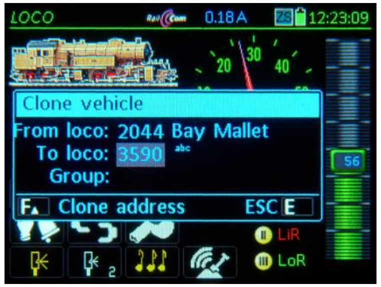
Softkey M ➝ Enters the **Menu** in ***LOCO*** mode
Scrolling wheel ➝ Select from the two menu lines "Clone…"
A-Key ➝ Start the selected cloning procedure



M →



The clone window opens after the selected cloning procedure is started (here: "Cloning from active address") ▶



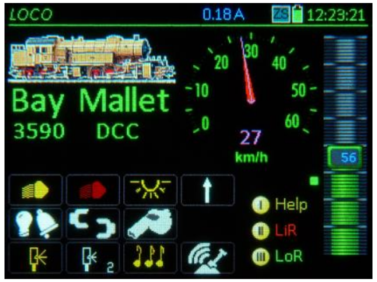
Clone vehicle
From loco: 2044 Bay Mallet
To loco: 3590
Group:
F Clone address ESC E

In it, the **desired address** (mandatory) and a name (optional) for the clone is entered (by overwriting suggestion).

A possible address conflict (when an address is already in the system) is detected automatically and a corresponding alert appears in the window. The **cloning process** however **is not blocked,** because it may be desirable to have a duplicate address...

F-Key ➝ activates the clone, operating mode ***LOCO***

The name of the clone in this example has not been changed and is as suggested "Crocodile (2), however all GUI elements are identical to the "Crocodile" origin. The picture already shows the driving mode. ▶



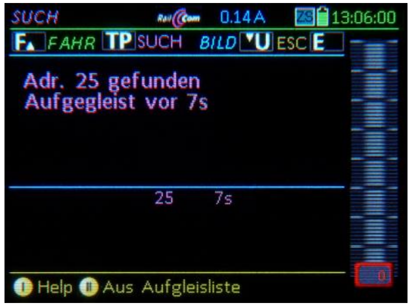
Cloning also takes over the individual function states (i.e. headlights and sound are turned on immediately).

All of the clone's GUI elements are **totally independent from its origin** and can be changed at any time with the usual E-procedures ***ADDR … FUMT, SPEEDO etc.*** or with **A+A-Key** in the ***LOCO MOD*** screen (Name, Group).

Cloning in the "opposite direction", that is "Cloning from ObjDB Origin" is often used to quickly and easily find a **fitting GUI for a new engine** or for using it as a template.

For this, the same kind or a similar vehicle on the layout is used (which already has a GUI).

In the picture on the right, it is assumed that the address of a new engine is unknown and therefore first read-out with the track-On search feature (see chapter "LOCO IN and LOCO MOD"). Then:



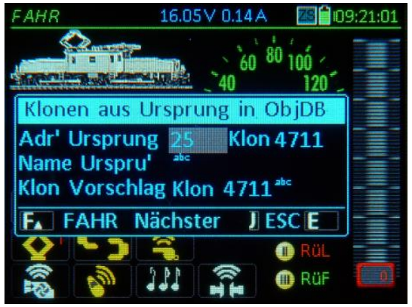
Adr. 25 gefunden
Aufgegleist vor 7s
25 7s

F-Key ➝ switches to the driving mode ***LOCO,*** in this case only to get to the menu.

Softkey M ➝ enters the menu

Scroll, then A-Key ➝ opens the clone window

In the clone window (here: „ Cloning from ObjDB Origin") enter the address of the origin from which the clone (the new engine) takes over the GUI; the destination address (the clone) is however fixed.



Klonen aus Ursprung in ObjDB
Adr' Ursprung 25 Klon 4711
Name Ursprü'
Klon Vorschlag Klon 4711
F FAHR Nächster U ESC E

F- Key ➝ the clone is activated, operating mode ***LOCO***

U- Key ➝ optional: step by step search of the ObjDB entries for a suitable origin (for a name or address with the correct GUI).

13. Operating Mode *LOCO*

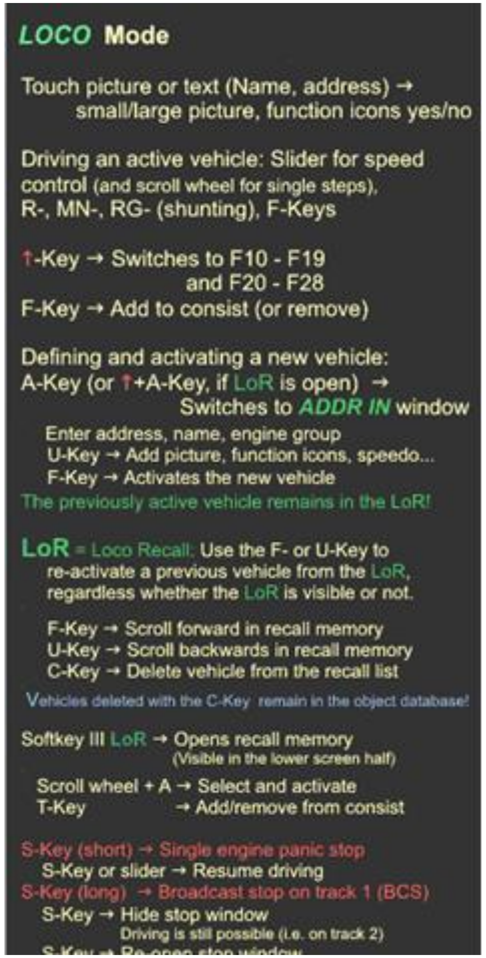
LOCO is accessible from most operating modes including ***LOCO IN***:

F-Key ➝ *LOCO* (new vehicle)

LOCO is the controller's main operating mode where locos (trains) are operated from.

NOTE: *Consist operations are covered in the next chapter.*

▼ The ***LOCO*** Help-File ▶



***LOCO* Mode**

Touch picture or text (Name, address) ➝
small/large picture, function icons yes/no

Driving an active vehicle: Slider for speed control (and scroll wheel for single steps),
R-, MN-, RG- (shunting), F-Keys

↑-Key ➝ Switches to F10 - F19
and F20 - F28
F-Key ➝ Add to consist (or remove)

Defining and activating a new vehicle:
A-Key (or ↑+A-Key, if LoR is open) ➝
Switches to *ADDR IN* window
Enter address, name, engine group
U-Key ➝ Add picture, function icons, speedo...
F-Key ➝ Activates the new vehicle
The previously active vehicle remains in the LoR!

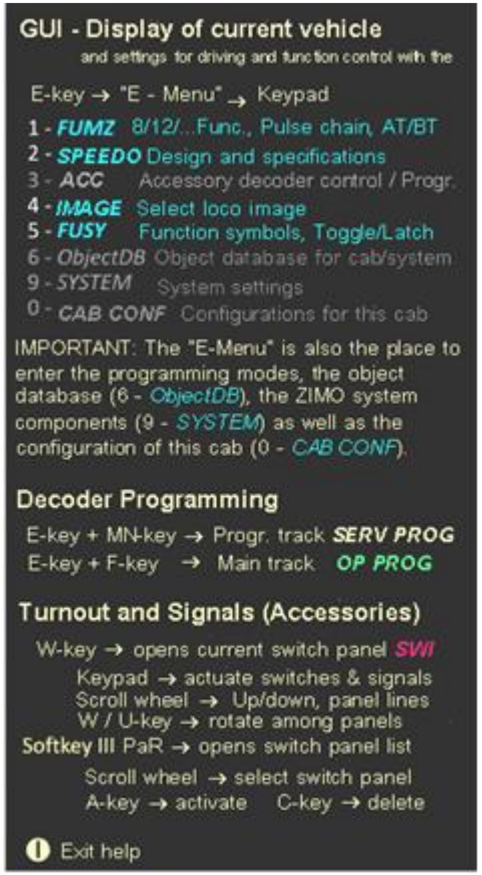
LoR = Loco Recall: Use the F- or U-Key to re-activate a previous vehicle from the LoR, regardless whether the LoR is visible or not.

F-Key ➝ Scroll forward in recall memory
U-Key ➝ Scroll backwards in recall memory
C-Key ➝ Delete vehicle from the recall list
Vehicles deleted with the C-Key remain in the object database!

Softkey III LoR ➝ Opens recall memory
(Visible in the lower screen half)

Scroll wheel + A ➝ Select and activate
T-Key ➝ Add/remove from consist

S-Key (short) ➝ Single engine panic stop
S-Key or slider ➝ Resume driving
S-Key (long) ➝ Broadcast stop on track 1 (BCS)
S-Key ➝ Hide stop window
Driving is still possible (i.e. on track 2)
S-Key ➝ Re-open stop window



GUI - Display of current vehicle
and settings for driving and function control with the

E-key → "E - Menu" → Keypad
1 - *FUMZ* 8/12/...Func., Pulse chain, AT/BT
2 - *SPEEDO* Design and specifications
3 - *ACC* Accessory decoder control / Progr.
4 - *IMAGE* Select loco image
5 - *FUSY* Function symbols, Toggle/Latch
6 - *ObjectDB* Object database for cab/system
9 - *SYSTEM* System settings
0 - *CAB CONF* Configurations for this cab

IMPORTANT: The "E-Menu" is also the place to enter the programming modes, the object database (6 - *ObjectDB*), the ZIMO system components (9 - *SYSTEM*) as well as the configuration of this cab (0 - *CAB CONF*).

Decoder Programming

E-key + MN-key → Progr. track ***SERV PROG***
E-key + F-key → Main track ***OP PROG***

Turnout and Signals (Accessories)

W-key → opens current switch panel *SWI*
Keypad → actuate switches & signals
Scroll wheel → Up/down, panel lines
W / U-key → rotate among panels
Softkey III PaR → opens switch panel list
Scroll wheel → select switch panel
A-key → activate C-key → delete

Ⓘ Exit help

The operating mode ***LOCO*** offers **different display representations:**

The possibilities depend on which GUI elements for theactive vehicles are present (i.e. defined, which is NOT always "visible"):

- always present: die vehicle **address**,
  at the beginning usually assigned automatically with a speedo (most often with a green dial, which can be changed in the vehicle template address 16383),
- optional: a **Name** (added in the ***LOCO IN*** screen when entering the address or with **A** + **A**),
- optional: a **Speedo** (select from various dials, or "No Speedo"; from ***ADDR SPEEDO***, with **E** + **2**),
- optional: an **Image** (from ***ADDR IMAGE***, after address input or later with **E** + **4**)
- always present: the **Function Icon** table (from ***ADDR FUSY***, or later with **E** + **5**),

the GUI elements (if any) can be displayed (or hidden) on the screen according **to individual taste**, or arranged differently.

These display modes can be selected via **TOUCH** screen (alternatively also via the ***LOCO*** menu); this applies in principle:

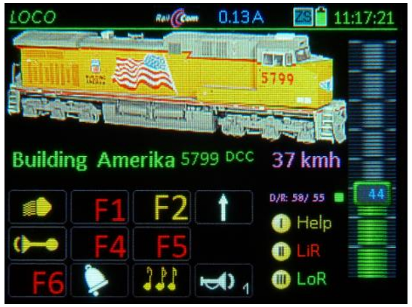
TOUCH the GUI-Element →

the touched element changes size larger <> smaller.

Text field (Name & Address) larger - smaller, Image larger - smaller, Large speedo – small digital display (the rest of the GUI elements are displayed in an appropriate way (or not when there is no space)

The only GUI element that CANNOT be changed by **tapping the touch screen** is the function icon table (in this case, **TOUCH** is used to switch the functions themselves); the function icon panel is displayed only when "address & name" AND "picture" are made small OR when large picture AND the digital speed are displayed instead of the speedo dial.

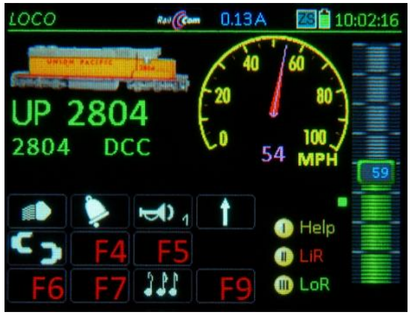
EXAMPLES
for screen modifications by TOUCH*:*



◀ "Normal view": Display with large image, small speedo (speed shown with digits only).

↓ **TAP** the image

TAP the image ➝ Digital speed display is replaced with actual speedo.

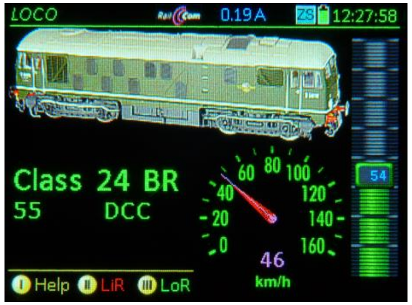


◀ Display with small image, speedo, name and address.

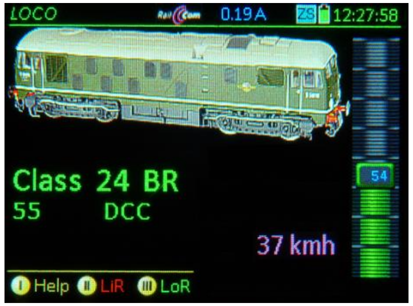
(**TAP the speedo ➝ Returns to normal view**)

TAP the speedo (in normal view) → large image and speedo below. There are NO function icons in this view.

Display with large image and speedo below ▶



(TAP the speedo → Returns to “normal view”)



TAP the text field (in normal view; Text field = Name & Address or just address without name) → Speedo is removed to make room for larger image and name & address.

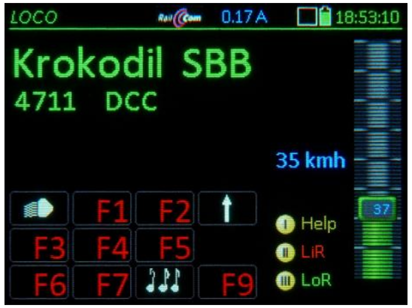
◀ Display with large text for name & address but without speedo and function icons

(TAP the image + Speedo → return to “normal view”)

TAP the image + text (in normal view) → Digital speed display, large text and function icons.

(TAP the text + Image + Speedo →

Return to “normal view”)



Die MN-Key (“Manual”) and the RG-Key (“Shunting”)

MN- ***Key*** – **“MANual”** – MN-LED flashing red: Cancels the HLU speed reduction (Signal controlled speed influence through MX9 or StEin modules)
or ABC (Stop on sections with asymmetrical track signal – see decoder instruction manual).

RG- ***Key*** – **Shunting** → Press 1 x: RG-LED yellow, speed range is cut in half (64 instead of 128 steps).
Press 2 x: 1/3 of actual speed (42 instead of 128 steps).
Press again: Shunting mode OFF; RG-LED dark.

> NOTE*:* The volume of sounds that can be triggered with function keys can be changed (by turning the scrolling wheel): keep the function key pressed, turn the scrolling wheel ("up" = louder, "down" = softer).

The East-West - Direction

The ZIMO system offers the possibility to drive a **vehicle equipped with ZIMO decoder** (types from approx. 2005 and later, with up-to-date software) specifically in the desired layout-related direction, thus to "east" or "west". This can just as well be understood as "left" and "right"; the east-west orientation actually refers to the track polarity as connected to the command station. The usual forward-backward direction in DCC systems, on the other hand, is vehicle-related and the “true” direction of travel depends on how the locomotive is placed on the track.

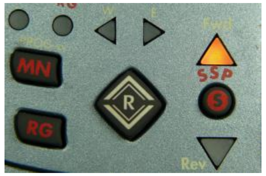
The "East-West direction" on the controller is indicated by the "E-W direction arrows", which remain dark as long as the "East-West" feature is not used.

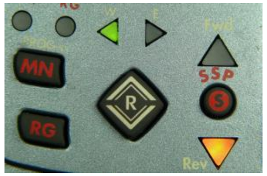
Press ↑ (Shift) **– R-Key** together (↑ ahead) | **if the E-W direction arrows are dark → the travel direction** will be set (switches direction if needed) so that the vehicle will be driving "west", or the headlights pointing west at standstill, and **the direction arrow** "W" lights up.
(However, if you want to drive to the "east", the **R-key** must be pressed):
Press R-Key again, while holding the ↑ (Shift)-Key → that the vehicle will be driving "east", or the headlights pointing east at standstill, and **the direction arrow** "E" lights up.

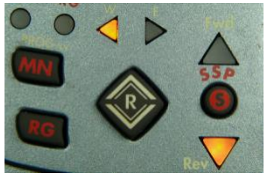
↑ (Shift) **- R-Key** together (↑ ahead) | ***if one of the E-W direction arrows is lit already*** **→ Driving direction** will NOT be influenced anymore, but swaps the E-W direction arrows instead
(i.e. so that the left-right arrows match the train direction at the back of an track oval)

> NOTE*: The* ↑ **– R** *is usually used only once, to activate the east-west direction feature and to let the train drive in the desired east-west direction, then the simple* **R-key** *action is enough*.

The colors of the direction LED’s (both forward-reverse as well as east-west):
green = after change of direction with the R-key, as long as RailCom feedback has not arrived,
yellow = direction confirmed by RailCom







Limitations:

If it is a ZIMO decoder (with current software) but **RailCom is turned off**, commands for the E / W direction can still be given, but without feedback on the forward-reverse direction; Fwd-Rev arrows stay green. Terminal loops can’t be reported either (although they are passed through correctly).

If it is a **non-ZIMO decoder** (or a ZIMO decoder with outdated software), East-West can only be used as a reminder, i.e. the E-W arrows are assigned at your discretion without having an effect on the vehicle.

Deactivate the East-West-Display:

↑ (Shift hold) **+ R + R + R** (that is 3 times the **R-Key** while holding the Shift key) → Deactivates the E-W-Direction Arrows

The main purpose of the East-West feature is actually for computer-controlled layouts, when trains are under control of ZIMO's special "Signal Controlled Speed Influence" HLU or when direct driving commands are given. The logic of the route can then ensure the desired travel direction and thereby prevent a train from taking off in the "wrong" direction, because a locomotive has been turned around before, either by a shunting maneuver or by hand.

The LOWER SCREEN HALF
can also be used differently than in the "normal" LOCO presentations.

This will usually replace the function icons with the desired content.

Softkey III → Opens the **LoR** (= Loco Recall memory) in the lower screen half
repeat (while **LoR** is open) **Softkey III → Close**

Softkey II → Opens the ***ACC LIST*** (Accessory addresses),
repeat (while ***ACC LIST*** is open) **Softkey II → Close**

E-Key + 8 → Opens the ***STEIN LIST*** (Stationary Equipment Module "StEin")
repeat (while ***STEIN LIST*** is open) **Softkey II → Close**

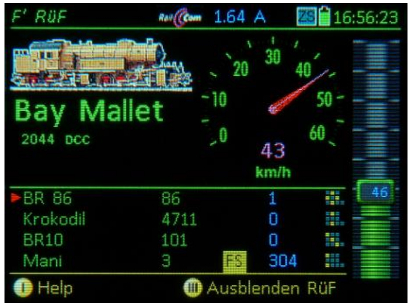
W- Key → Opens a switch panel; and switches to the operating mode ***SWI***
Repeat (while panel is open) **W- Key → closes** the panel, returns to ***LOCO***

Tap on the **LoR** or a ***LIST*** → to toggle between full screen and half screen

Softkey III → LoR in the lower half of the display, ▶
see description in this chapter

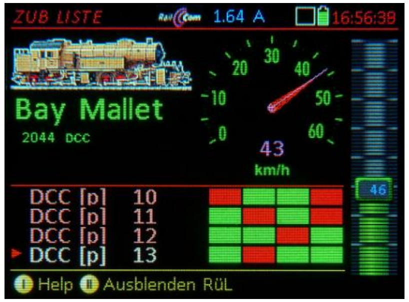
The **LoR** (= Loco Recall memory) provides an overview of and quick access to all vehicles (addresses) and trains that are already in this controller. 4 lines can be seen at once, the rest is made visible by scrolling.

Each line contains name, address, current speed (preferably through RailCom feedback), functions F0...F9 and a possible consist membership (T1, T2…).
A-Key → activates the marked vehicle.


F' RüF 1.64 A 16:56:23
Bay Mallet
2044 DCC
43 km/h

BR 86	86		1
Krokodil	4711		0
BR10	101		0
Mani	3	FS	304

Help Ausblenden RüF

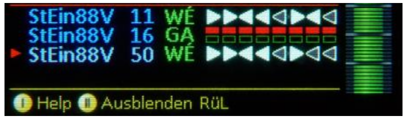

ZUB LISTE 1.64 A 16:56:38
Bay Mallet
2044 DCC
43 km/h

DCC [p] 10
DCC [p] 11
DCC [p] 12
DCC [p] 13

Help Ausblenden RüL

Softkey II → *ACC LIST* opens,
also see chapter ***ACC LIST***

◀ (= List of accessory addresses) shows the addresses of accessory decoders as well as MX8 and MX9 modules registered in this cab. The accessories belonging to the marked address can be operated by the number keys.
A-Key at the line >NEW< → Enter another address as single/paired function.


StEin88V 11 WE
StEin88V 16 GA
StEin88V 50 WE
Help Ausblenden RüL

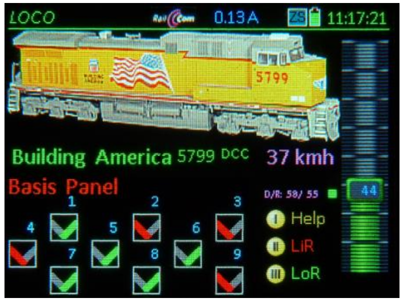
E-Key + 8 → *STEIN LIST* opens,
also see chapter ***STEIN LIST***

◣ (= StEin Module List) shows the track sections, turnouts and other inputs / outputs of the StEin modules.

W-Key → *SWI* in the lower half of the display, ▶
also see chapter *Operating mode **SWI***

In the operating mode ***SWI*** (= switching turnouts, but actually operates all types of accessories) "panels" or track diagrams are filled with icons for turnouts, signals, etc., which are used for operation on the layout.

See chapter ***SWI*** – for object-oriented control of turnouts and signals…


LOCO 0.13A 11:17:21
Building America 5799 DCC 37 kmh
Basis Panel
D/R: 58/ 55
Help
LiR
LoR

The ZIMO system is based on sophisticated data management. This can largely be ignored for small applications (i.e. the garden railroad with 10 or 20 engines), so to "just get started" it is ok. If a large layout (i.e. with 100 or several 100 engines) is to be operated, it is advisable to know the system's philosophy.

Especially important are the two data structures in the MX32 controller:

Loco Recall = LoR & Object Database = ObjectDb

Each "Driving Object" (Address, vehicle, train) that is activated and driven will remain in the **LoR** (recall memory) and the ***ObjectDb*** (object database) even after it is deactivated; the **LoR** however is limited to a maximum of 128 objects.

Both, current driving data and the so-called "GUI data" are stored there. The latter determines the appearance of the vehicle on display screens, such as name, image, function icons, etc.

The task of the **LoR** (recall memory) is to quickly find, observe and activate vehicles (trains...) that were active on this cab earlier, but were moved to the background (inactive) due to the activation of a different vehicle; the **LoR** is also a kind of "Favorites list".

It is recommended to delete entries that are likely no longer needed from the **LoR** (C-Key in the **LoR** table display); this will NOT delete them from the ***ObjectDb*** (object database), so that the data can be retrieved by the **LoR** if needed.

Objects stored in the **LoR** (loco recall memory) are also ALWAYS stored in the ***ObjectDb*** (object database) and identified there by the ***green*** font. The reverse is NOT the case; there are usually many more entries in the ***ObjectDb*** (blue font, if the address is not in the **LoR**).

There is also access to the ***ObjectDb*** - with the possibility of transfer - to the object databases of other devices (control panels, control center, apps, if integrated). Deleting an object from the object database is also possible (C-Key…) but should be proceeded with caution (create a back-up first).

See chapter ***ObjctDb (Object Database)***

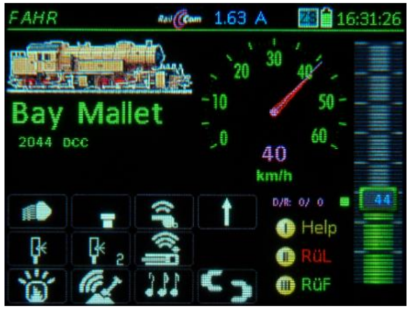
Another important data structure in the system is the **object database of the MX10 command station**, which is primarily used to organize the data packets (DCC, MM...) that are to be sent via tracks to the vehicles and accessories.

There, copies of object database entries of all cabs and other input devices are created automatically. As already briefly mentioned above, entries can also be transferred back to the cabs, or just parts of the data, i.e. for the purpose of the so-called "GUI acquisition" (if, for example, the name and the image for a particular address from one cab should be copied to another cab).

The loco recall memory (**LoR**) is **always** available in the operating mode ***LOCO*** to activate vehicles, whether it is visible or not:

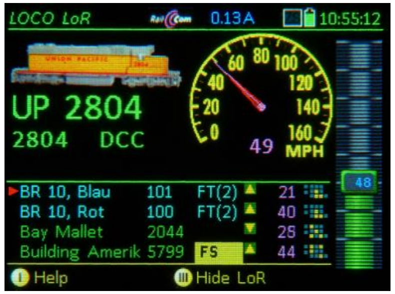
F- and **U-Key → switches directly** from address to address (more precisely: from driving object to driving object, which may also be consists or trains), ascending or descending in the loco recall memory (**LoR**). If required, the object list containing names and addresses can be made visible in the lower half of the screen:

Softkey III ***LoR*** **→ displays** the loco recall memory (***LoR***) instead of the function keys.



→ SK III ←

Softkey III ***LoR*** **→ hides** the loco recall memory (***LoR***), the function keys are shown again.



►BR 10, Blau	101	FT(2)	▲	21	
BR 10, Rot	100	FT(2)	▲	40	
Bay Mallet	2044		▼	25	
Building Amerik	5799	FS	▲	44	

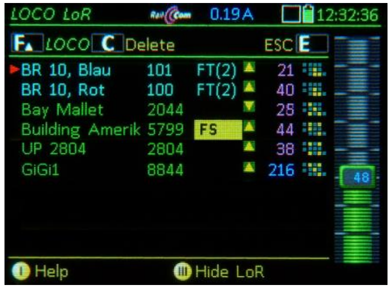
↓ **TOUCH** on ***LoR*** ↑

TAP on the ***LoR*** - → **Full-screen display** ▶

The functions are the same as in the half-screen display but with a higher number of visible lines.

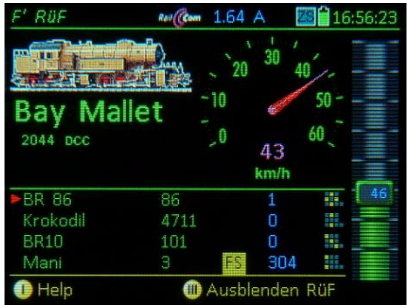
At the end of the ***LoR*** list is always the line >NEW<, for an alternative way to get to the address input screen (instead of using the A-Key or ↑ + A).

TAP the large ***LoR*** - field → returns to the **Half-screen representation**



►BR 10, Blau	101	FT(2)	▲	21	
BR 10, Rot	100	FT(2)	▲	40	
Bay Mallet	2044		▼	25	
Building Amerik	5799	FS	▲	44	
UP 2804	2804		▲	38	
GiGi1	8844		▲	216	

The **individual rows** of the ***LoR*** contain in the **first level** (see below for second level):



►BR 86	86		1	
Krokodil	4711		0	
BR10	101		0	
Mani	3	FS	304	

* First column: Vehicle name (if one is given, otherwise substitute-dashes)

green: "normal" single vehicle
turquoise: vehicle that is part of a consist (see third column)

* Second column: Vehicle address (without further identification, if it's a DCC address)

* Third column: External control, (External) Consist *)

"FS": Vehicle controlled by another controller
"T1, T2…: Vehicle is part of a consist
"FT(..)": Consist belongs to another controller
"FS(..)": Consist controlled by another controller

* Fourth column: Speed

magenta: km/h-value from RailCom feedback, or
blue: Speed in 1024 speed-step - scale (NOT in km/h)

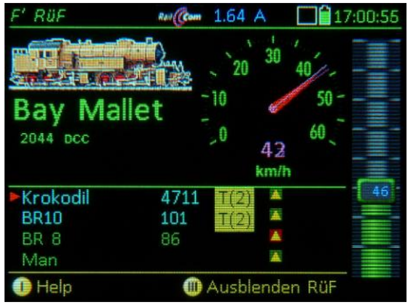
* Fifth column: Direction (stand-still / driving)

* Sixth column: small function table F0 ... F9 (to see which functions are turned on, i.e. headlight, sound…).

*) *For cconsisting: see chapter Consist Operations*

Rocker switch → to second level of the ***LoR*** display.

The **individual rows** of the second level contain:



►Krokodil	4711	T(2)	▲
BR10	101	T(2)	▲
BR 8	86		▲
Man			▲

* First column to fourth column: same as the first level.

* Fifth column: Group info (if available)

The arrangement of the symbols is not yet final,

depending on the development level of consisting!

Activating a vehicle from the LoR and other actuations

Softkey III → Open or close the loco recall memory (also see above)

F- and **U-Key** → **switches directly** to the next address in memory; ascending or descending, regardless of whether the ***LoR*** is visible (open) or invisible,

Scrolling wheel → Scrolling through the recall memory and **marking** with the cursor (regardless of the scrolling wheel setting in ***CONFIG***),

A-Key → ***activation from the LoR*** (bringing the marked address to the foreground).

Softkey II → Sort (Change the order of objects in the recall memory),

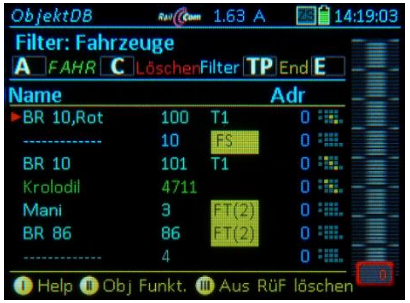
C-Key → Delete marked object from the recall memory (remains in the Object Database!).

Activating a vehicle from the Object Database

E-Key (to the E-Screen) + 6-Key
→ switches to the ***ObjectDb***

Scrolling wheel → scroll through object database,

A-Key → **activates** the selected objects and returns to the operating mode ***LOCO.***



Name			Adr	
►BR 10,Rot	100	T1	0	
-------------	10	FS	0	
BR 10	101	T1	0	
Krolodil	4711		0	
Mani	3	FT(2)	0	
BR 86	86	FT(2)	0	
-------------	4		0	

For more info about the object database:
see chapter ***ObjectDb.***

14. DRIVING AND CONSIST CONTROL

There are two versions of consisting in the DCC world:

- using a **“consist address”** in the decoder (in CVs #19 & 20), which is set to an identical value in the participating vehicles of a consist,
- using the system by sending identical, **de facto simultaneous** driving commands (in reality quick successive commands), to all addresses involved in the consist.

*The second type, which is the **system-controlled consist formation** is the **preferred** method by ZIMO due to the higher flexibility.*

The ZIMO system distinguishes between two types of system-controlled consisting:

“Consists” vs. *“Trains”*

The goal in both cases is that two or more vehicles are controlled at the same time by one cab (ZIMO cab or app), i.e. always drive at the same speed and in the same direction. For this purpose, the desired double-header whether consist or "train" must be previously defined. The differences between the two types of consists are:

“Consists” (current chapter)	***“Trains” (Chapter 17)***
Several vehicle addresses are provided with a ***consist*** number (T1, T2, T3...) by placing a corresponding marker in the ***LoR*** (loco recall memory) of the cab. The speeds and directions of the addresses involved in a ***consist,*** always match each other, irrespective of to which vehicle (or address) a change is made.	A ***“Train”*** is formed by either transforming a ***consist*** or by its own definition procedure. The ***"train"*** distinguishes itself by its **own name,** which must be assigned to it (not just a consist number). This makes it to an independent **object**.
Consists are usually used to couple several locomotives with each other or to logically connect a pilot car on one end of a shuttle with the engine on the other end.	A **"train"** usually consists of at least one engine (locomotive) and several cars, each equipped with their own decoders whose order can also be defined. Dedicated procedures allow for a comfortable logical (or also the physical) "coupling / uncoupling”.
The vehicles participating in a double-header or multiple consist remain listed in the ***LoR*** (loco recall memory) and ***ObjectDb*** (object database) as separate objects. There are sorting options, and shortcuts for fast switching between the loco addresses.	

BASIC INFORMATION ABOUT SYSTEM-CONTROLLED CONSISTING:

- Double-headers or consists, means linking together two or more vehicles (= addresses). This causes all engines in the consist to react the same when a new speed, direction, MAN or RG command is sent to any one of them. Functions on the other hand are still controlled individually for each decoder in the consist.

- A consist resides in principle NOT "in the system" (command station), but always in "a controller”, i.e. a MX32 controller (or in a ZIMO app.) Either the consist was established in this controller, or it was set-up in another controller and taken over by this one.

> NOTE: *The takeover of a consist, more specifically the "link defined by a consist" is similar, but NOT organized exactly the same as the takeover of an individual vehicle, but may coincide with such.*

- Consists "do NOT reside" in the command station but are "copies" there, that is, they are also linked with the formation in the "residence-controller". On the one hand, this is due to the need for existing traction to prioritize the DCC rail signal (or other formats), on the other hand, traction will continue to exist if the "residence device" is removed from the system (or the radio connection is broken); It can therefore continue to be taken over by another device, which then functions as residence device.

> NOTE*:* An address that is in a "foreign consist" is marked with "FT" (see below). This means, the address is in a consist that either "resides" in another controller or is "only mapped" in the command station (because the actual "residence device" is no longer in the system, e.g. because of a missing radio link). To prevent unnecessary confusion, this difference is not visible to the user: it is always marked with "FT" (and the number of addresses that belong to the consist) but without information about the current residence controller, or whether such a controller is present at all.

- Whenever a consist (or an address thereof) is activated (enters the LOCO window), the controller (in which the consist resides at the latest after taking it over) informs the command station of the consist parameters (addresses, settings, ...). This message takes precedence over the current content related in this respect in the command station, IF this command station is the home system. If not; see below:

INTERNAL REMARKS: All situations related to consists being transferred from one system to another via the residence controller are difficult.

PRELIMINARY NOTE: Turning power off and back on should - as usual – change nothing: The residence controllers retain their consist, the "copies" in the command station are retained, regardless of whether the respective residence controllers are still present at power-up.

PRELIMINARY NOTE 2: The brake-up of a consist is only possible in a residence controller. This means, if an address is called up, which belongs to a consist that is marked with "FT" and is taken over with the U-Key (to the current “residence controller”), the consist can now be resolved or individual addresses be removed or added to it. These processes are once again immediately "copied” to the central command station.

ATTENTION: Every consist in the residence controller must be provided with information as to which "home system" (command station ID) it belongs to. It is certainly possible to have consists in one controller that were built in different home systems or are acquired by take-over from the home system the controller is currently connected to.

If a residence controller is connected to a new command station (recognizable by the new "home system"), the controller initially does not contain a copy of the consists that reside in this command station. Only in case a consist residing in the controller is to be activated, it will be copied to the command station, BUT ONLY IF THIS is possible (i.e. all participating addresses do not yet exist.) Otherwise, it will be rejected and a corresponding message appears on the controller display.

Setting up consists

A consist is a combination of locomotives with jointly controlled speed, direction, MAN and shunting function.

The starting point is the operating mode ***LOCO***; the addresses intended for the consist must already be in the ***LoR*** (loco recall memory) and must not be actively controlled on another MX32 (FS).

Softkey III → ***LoR*** opens (if not already open); the third column (after the address) gives information about existing consists:

"FS": A single vehicle active in another controller. Can therefore NOT BE PART OF THIS CONSIST.

"FT(..)" means: CONSIST assignment is NOT possible, ▶ because it is active on another controller EITHER as single vehicle OR part of a consist.

> NOTE: For takeover of a complete consist: see next page!

Scrolling wheel → select the first vehicle to be part of the consist and with the

TP-Key + **Number key** → **assign** the selected vehicle to the consist, i.e. "T1", "T2"…" etc. ▶
(ATTENTION: 7 sec timeout). The consist designation ("T1", " T2"...) is visible in the ***LoR*** line AND in the upper main field (if this engine is in the foreground); the line in the lower half AND the main text above appear in the color turquoise.

The assignment to a consist causes the relevant address in the ***LoR*** of other controllers to be marked with "FT (…)", and is therefore no longer available for consist building in those controllers.

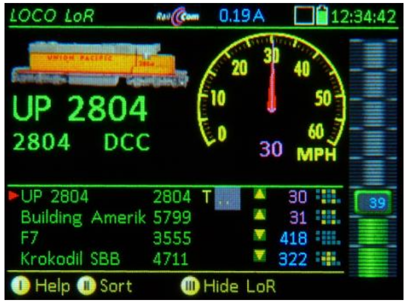
Scrolling wheel + **TP-Key** + Number key → select more addresses and **add** them with "T1", "T2"…" to the respective engine/consist.

These ***LoR*** lines also turn turquoise and are sorted automatically so that they are listed together. ▶

The lines in the ***LoR*** that belong to a consist (at least two addresses marked "T1" (up to "T9" is possible)), are **automatically shifted up** in the ***LoR*** and the respective vehicles are **controlled together.**

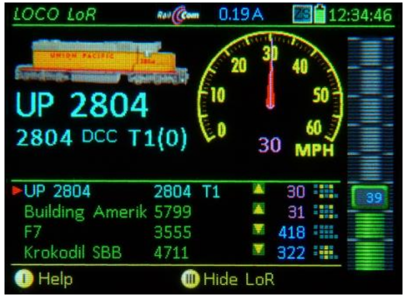
Speed, direction, MAN, and RG commands are the same for all addresses, regardless of which of the addresses is currently in the foreground and receives a speed change for example.

> NOTE: turning off the MX10 deletes the current consists and therefore, they are no longer available in the MX32 after rebooting the system.



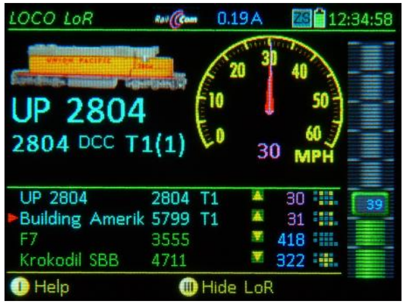
UP 2804 2804 T .. 30
Building Amerik 5799 31
F7 3555 418
Krokodil SBB 4711 322

T, 1



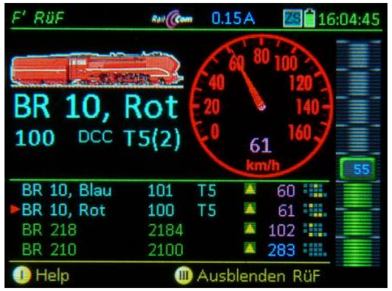
UP 2804 2804 T1 30
Building Amerik 5799 31
F7 3555 418
Krokodil SBB 4711 322

Scroll, T, 1



UP 2804 2804 T1 30
Building Amerik 5799 T1 31
F7 3555 418
Krokodil SBB 4711 322

Scroll, A



BR 10, Blau 101 T5 60
BR 10, Rot 100 T5 61
BR 218 2184 102
BR 210 2100 283

Softkey III → **Open/Close** the ***LoR*** is always possible, in order to see the function icons for the active vehicle in the foreground, for example. ▶

The turquoise text and the "T1", "T2"... behind the address indicates that this vehicle is part of a consist.

TP-Key (only when ***LoR*** is **off**) on an address with a T-marker and turquoise text (which belongs to a consist "T1", "T2"...) → **Switches to the next address** of this consist, that is, brings the next consist vehicle to the foreground. ▶

It is of course also possible to switch among the consist addresses with ***LoR*** **open**, but requires an extra step: by scrolling (**with the Scrolling wheel**) to the address and activating it (**with the A-Key**).

Matching the Direction and Speed among vehicles of a consist:

*Only possible if the **LoR** is **open** (use Softkey III to open, if necessary):*

TP- Key → opens a window to select the vehicle in the ***LoR***; use the **Scrolling wheel** to select:

Direction change: **A-Key** (Vehicle must be at stand-still)
Matching speed: **Speed slider** (Vehicle moving)
(not yet implemented) ▶

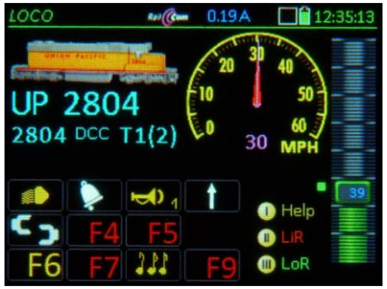
All other vehicles of the consist are not affected by these changes. Store and exit with the **E-Key**.

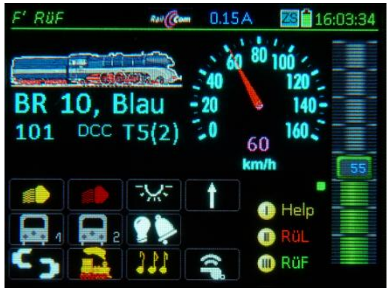
Break up a consist or remove a consist vehicle:

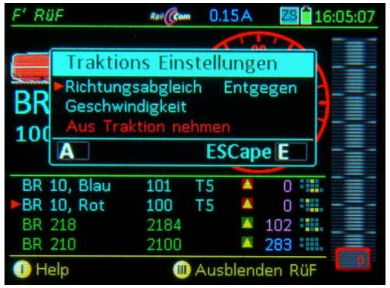
*Only possible if the **LoR** is **open** (use Softkey III to open, if necessary):*

Press the **C-Key** with the arrow pointing to an address marked with a "T" in turquoise text (that belongs to a consist "T1", "T2"…") → **Removes that address** from the current consist and deletes the T-marker. The corresponding ***LoR*** text line turns green again. Removing the second last vehicle dissolves the consist. ▶

At any time: **Rocker switch** → switches to the **Second level** of the ***LoR*** (with direction and position indicators)

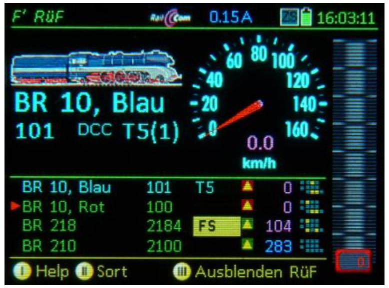






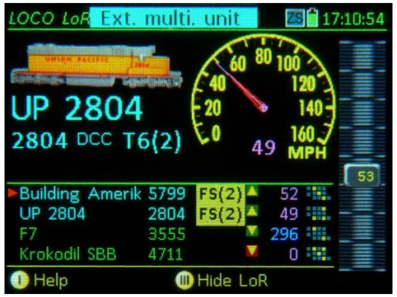
Traktions Einstellungen
Richtungsabgleich Entgegen
Geschwindigkeit
Aus Traktion nehmen

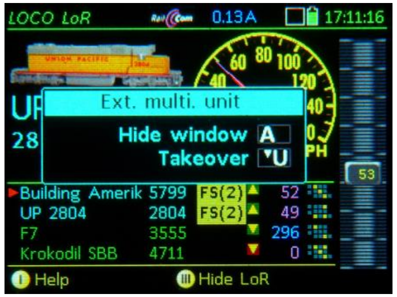
BR 10, Blau 101 T5 0
BR 10, Rot 100 T5 0
BR 218 2184 102
BR 210 2100 283

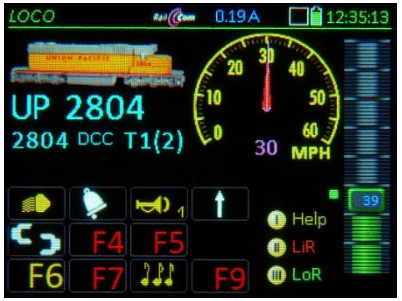


BR 10, Blau 101 T5 0
BR 10, Rot 100 0
BR 218 2184 FS 104
BR 210 2100 283

Handover/Takeover of consist between controllers:







◀ If an address in the ***LoR*** is marked with "FT (..)", the vehicle can not be activated directly because it is part of a consist in another controller *), which is NOT ACTIVE at the moment (not in that controller's foreground). If, on the other hand, this consist is currently ACTIVE in the other controller (i.e. one of the vehicles involved is in the foreground on that controller), "FS (..)" is displayed in the ***LoR*** (= external control with the number of consisted vehicles).

*) This is also the case if this other controller, the "owner" of the consist, is no longer connected to the system or the radio communication is lost.

These "FT (..)" or "FS (..)" markers are also shown in the main address field (after the vehicle is brought to the foreground with the **A-Key** from a ***LoR*** line or via the **F-** and **U-key**) together with the corresponding note "External Consist" or "External Control" in the header.

If a takeover attempt of such a vehicle is made (by pressing a function key or changing the speed), the header closes and in its place the WINDOW

"External Consist" or "External Control" opens

◀ with these options:

U-Key → the consist (= with all participating engines) is taken over and controlled by the new controller. At the same time the **ownership** **) of the consist changes from the old to the new controller, and all vehicles involved *) receive a mark such as "T1", "T2" … ", while on the old controller these addresses are changed to "FS (..)".

*) Addresses that belong to the consist but have not yet existed on the new controller will also automatically be included in the ***LoR*** (with the markers "T1", "T2" … ").

**) A consist can only belong to one user; this one can be changed; the original creator does NOT matter.

A- Key → the consist will NOT be taken over, the controller once again displays the header as before.

◀ After the consist has been taken over, all the addresses involved are located in the ***LoR*** of the "new" controller and marked with "T1", "T2" etc., whereby the system attempts to reassign the previously used T-number (if free).

Technical Supplement to the Instruction Manual:

This part is theoretical in nature and not necessary for the normal operation of the MX32.

Basics:

The ZIMO system has a decentralized intelligence: each controller has, independently of each other, T1…T9 at its disposal; the system either has to deal with so many consists that the number is practically never reachable, or it would need a very complicated procedure with the corresponding GUI messages in case the memory is full.

The MX10 takes over the consists only temporarily until the system is turned off; however, they are stored permanently in the controller (including the calibration values). Each time a controller starts up and starts communicating with the MX10, it must send its own consist data to the command station, where it will remain active until the next system shutdown (the information is ignored if the consist already exists in the MX10 – i.e. after cable connection or radio interruption). In the MX10, the consists must have an identifier attached to it, made up of the T-number (1, 2...9) from the controller and the ID of the controller itself (unique worldwide).

To avoid inconsistencies, the controllers send their consist data regularly (preferably every 30 seconds). From this, the command station recognizes for example, when a consist has been deleted (and therefore needs to delete it also in the command station, as well as the "FTs" in the other controllers).

ATTENTION: This does NOT mean that the MX10 (except for Power-off) can forget a consist because it simply does not receive messages from a controller (it may be disconnected from the cable or radio), BUT: a consist must be erased in the MX10 memory after receiving a MESSAGE from the "owner"-controller that the consist no longer exists. The consist will be registered by the MX10 again at any time, should the controller send the message again.

Preliminary remarks about ending consists in the LoR and ObjDB

In cases in which the LoR or ObjectDB lines are processed with the C or TP key, remain unchanged for the "first development stage" AND the "second development stage".

If an address that has been assigned to a local consist (T1…T9), but is NOT THE SECOND LAST ADDRESS of this consist, is deleted from the LoR (**with the C-key**), it disappears from the LoR but remains in the ObjectDB without consist markers. The MX10 is informed that "this address has been removed from the local consist" - the MX10 response to this information depends on the" development level" (also removed in the MX10 with the "first" and "second" level).

If an address that has been assigned to a local consist (T1…T9), but is NOT THE SECOND LAST ADDRESS of this consist, is deleted from the ObjDB (**with the C-key**), it disappears from the LoR and ObjctDB. The MX10 is informed that "this address has been removed from the local consist" - the MX10 response to this information depends on the" development level" (also removed in the MX10 with the "first" and "second" level).

If the SECOND LAST ADDRESS of a local consist (T1…T9) is deleted from the LoR (**with the C-key**), it disappears from the LoR but remains in the ObjectDB without consist markers. At the same time, the consist number at the last address of this consist in the LoR and ObjDB is removed; the consist number becomes available again for other consists. The MX10 is informed that both the second last and the last addresses have been removed from the local consist - the MX10 response to this information depends on the" development level" (also removed in the MX10 with the "first" and "second" level).

If the SECOND LAST ADDRESS of a local consist (T1…T9) is deleted from the ObjectDB (**with the C-key**), it disappears from the LoR and the ObjectDB. At the same time, the consist number at the last address of this consist in the LoR and ObjDB is removed; the consist number becomes available again for other consists. The MX10 is informed that both the second last and the last addresses have been removed from the local consist - the MX10 response to this information depends on the" development level" (also removed in the MX10 with the "first" and "second" level).

If for an address, which is assigned to a local consist (T1… T9) but is NOT THE SECOND LAST ADDRESS of this consist, the traction marker is removed in the LoR OR in the ObjDB (**with the TP-key**), the address remains in LoR and ObjctDB, the consist marker however is removed in LoR AND ObjDB. The MX10 is informed that "this address should be removed from the consist in the MX10".

If for an address, which is assigned to a local consist (T1… T9) as THE SECOND LAST ADDRESS of this consist, the traction marker is removed in the LoR OR in the ObjDB (**with the TP-key**), the address remains in LoR and ObjDB. However, the consist number is also removed from the last consist address in the LoR and ObjDB; the consist number becomes available again for other consists. The MX10 is informed that "the second last as well as the last address should be removed from the consist in the MX10".

.

The **"First" and "Second Development Level" for Consists:**

The MX32 has to send the consist data concerning locally defined consists (T1… T9) at least every 5 sec to the MX10 command station– these are those that are stored in the local LoR memory (Note: there are no consists that exist in the ObjctDB, but not in the LoR). If no such "consist data" arrives at the MX10 for 10 sec, the consist is cleared from the MX10, but the data for the individual vehicles remains unchanged in the cycle (but not in the special consist packet cycle). That means:

(1) 10 seconds after the controller is disconnected from the CAN bus (or radio communication is interrupted), the MX10 no longer sends these addresses as a consist (i.e. no longer in the consist mode cycle); when reconnecting (or radio communication is reestablished), the controller sends the "consist data" again in 5 sec intervals, and the MX10 sends the data out again in the correct consist data package.

(2) if a MX32 message says "this address has been removed from the local consist", then this address will be removed from the consist in the MX10. To be on the safe side, the MX10 automatically breaks-up the consist if only one address remains.

The **"Third Development Level"** for consists – with additional MX10 based consists:

Consists now remain in the MX10, even if the relevant controller is temporarily or permanently logged off and even if a message from a controller arrives that says "this address was removed from the local consist in the controller", BUT NOT when the message says "remove this address from the consist in the MX10", which is the case when an address is removed from a consist with the T-key (but not if the address was deleted with the C key).

So, the MX10 will continue to send out all the addresses involved as consist addresses, in the packet-type cycle for consists, etc.

When a MX32 is attempting to take over one of the participating consist addresses (i.e., trying to activate or assign it to another consist / train), a prompt-window pops up with the existing MX10 consist, with the option to delete it.

WHAT THIS WILL LOOK LIKE, IS YET TO BE DEFINED.

The Help-File for ***Consisting*** ▶ *WILL BE ADDED LADER*

15. The STOP Options in the ZIMO System

- ***SINGLE STOP*** (also known as "Emergency Stop"); only stops the engine (or consist, train) currently under direct cab control and is meant to stop the engine in the shortest way possible, if the normal braking would take too long due to the set momentum in the decoder (CV #4…) and/or system.
- **BCS = BROADCAST STOP** (a standardized NMRA-DCC command on address 0); this command stops all vehicles but the decoders retain the last received data (i.e. lights remain lit) and it is possible to operate these functions.

  NOTE: Broadcast stops can be defined in ***CAB CONF*** (under "STOPP & OFF) as true **"Emergency"** stops or **"SS 0"** stops (= stops according to deceleration settings in the decoder, usually CV #4). A sudden emergency stop may lead to derailments under certain circumstances.
- ***OFF (Track Power)*** this is the fastest and safest type of a broadcast stop (independent of data reception). However, the decoders lose all data and the stopping distance is heavily dependent on possible built-in capacitors (gold caps), the stops are sudden (which often leads to derailments) and restarting a larger layout may take some time.

NOTE: Even though the stop handling is described here in the ***LOCO*** mode, it can of course be applied in other operating modes (esp. in SERV / OP PROG)!

S-Key (short) → SINGLE STOP ◢

(=emergency stop for the active engine (train), the green speed slider indicator turns red; the speed slider must be moved to 0 in order to restart the engine later)

and simultaneously → *displays the* **"STOP Bullets"** *(remain for 3 sec)*

By **touching** one of the **"bullet halves"** with the inscription **BCS** or **OFF**, on the command station, the two track outputs (if two are available, i.e. the MX10) can be set independently to **BCS (= broadcast stop)** or **OFF (track poser turned OFF)**.

The double effect of the S-bullet actuation is useful while driving the active engine (for emergency stops) or with the engine stopped (to access the STOP touch fields).

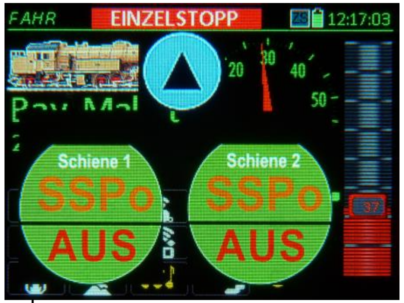
When a track output (or both) is set to **BCS** or **OFF,** the "STOP Bullets" pop up simultaneously on all controllers connected to the CAN bus (as well as on the command station MX10: red display), so that the layout can be restarted again from any controller. A "*SINGLE STOP"* on the other hand is only shown on one controller.

Setting track-1 to ***"BCS"*** (Broadcast stop) can be done with the above procedure, or simply by pressing the

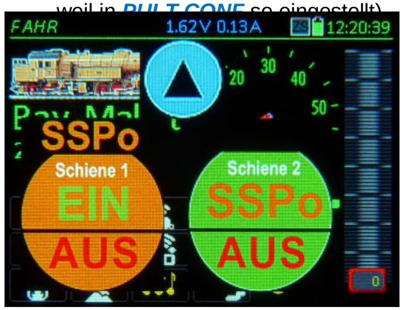
S-Key (>1 sec) → BCS (broadcast stop) on track-1 ▶

(stops all trains on track -1)

… and simultaneously → Displays the **"STOP Bullets "** (fades out when everything is "**ON**" again).



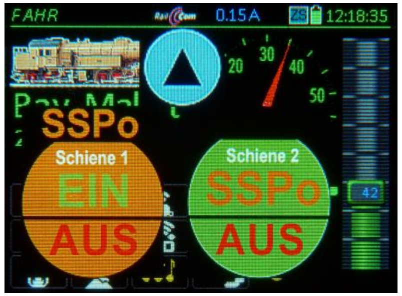
Touch auf „SSPo" Schiene-1 links) in diesem Fall „FS 0" - Bremsung, weil in ***PULT CONF*** so eingestellt)



Touching the blue arrow icon (pointing up)

→ **Removes the "STOP Bullets"** ▶

the blue arrow now appears in the header (pointing down, see picture below)



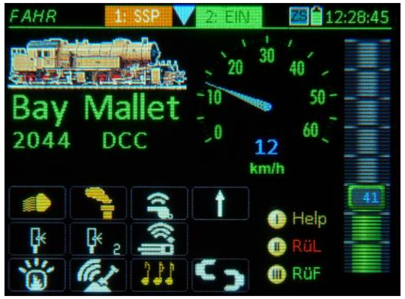
The purpose of removing the stop display is to get access to the screen content concealed by the STOP Bullets and thereby gain full control of the controller again, to operate trains on other track outputs (command station / booster) or to activate and drive another vehicle from the ***LoR*** (Loco Recall memory).

BUT: when the **STOP Bullets are no longer visible**, the track outputs CANNOT be switched between **BCS, OFF** and **ON**, therefore…

When the STOP Bullets are replaced by the small blue arrow in the header (pointing down):

Touching the small blue arrow (in the header)

→ **reopens the "STOP Bullets"** ▶



NOTE: The S-Key can NO LONGER be used to open or close the stop screen (as was possible with earlier SW versions).

The **S-Key** can be defined in ***CONFIG*** (see chapter CONFIG) so that a brief S-key actuation initiates a **BCS (Broadcast Stop)**, instead of the longer (default) actuation

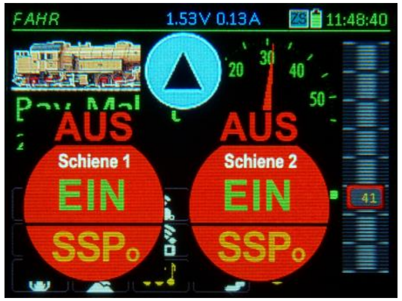
only then:

S-Key (brief) → BCS (Broadcast Stop) on track-1

(Stops all trains on track-1)

It makes sense when using this setting to also set the single-stop function to the direction key (a separate setting in ***CONFIG***).

in diesem Fall „Emergency"" - Bremsung bei Sammelstopp, weil in ***PULT CONF*** so eingestellt)



Special Key Sequences:

From the "normal" operating screen ***LOCO***:
S-Key (short) + **TP-Key → Power OFF on both tracks** ▶

From any state with at least one track not ON:
↑ *(Shift)* + **S-Key → Track power ON on both tracks**
same effect as **touching** both **ON** fields

Operating Boosters (also MX10s) connected to the MX10 command station:

Development phase APRIL 2018: All booster outputs are switched on and off together with the command station track-1; it is not (yet) possible to turn off sections of a layout.

Therefore: in the event of a short circuit (OVC) "anywhere" on the layout, track-1 and all track outputs of all boosters are switched off → normal display of the STOP Bullets for track-1 **with additional indication of the area that caused the short circuit.**

OVERCURRENT (SHORT CIRCUIT & UNDERVOLTAGE:

- **"OVC" = OVERCURRENT (Short);** the "OVC" message indicates that the maximum current defined in the command station (identified as "SHORT threshold" in the MX10) has been reached for the specified output, and the track output (1 or 2) has been turned off; therefore the message "1:SHORT" or "2:SHORT" is shown in the stop bullet (top).

  NOTE: ZIMO command stations don't allow for an actual overcurrent to flow, but rather limit the current to the set threshold. The term "overcurrent" is to be understood as "potential overcurrent", which would flow if not prevented by an automatic voltage reduction.
- ***"UND" = UNDERVOLTAGE***; the "UND" message is displayed, not because the overcurrent threshold was reached, but because the desired track voltage could not be maintained and the track power had to be turned off. This usually happens because of a weak power supply and the current thresholds for the track outputs are set too high, which causes the power supply to overload or overheat after reaching a specific current level, and therefore lowers the output voltage (= primary voltage for the command station).

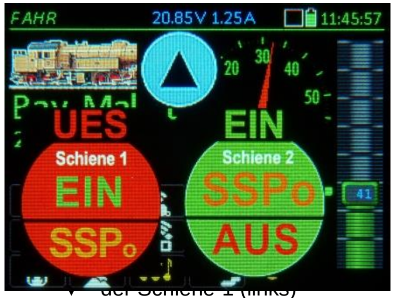
Overcurrent (Short circuit) on track-1 ▶

(Track output is turned off; there is NO automatic power-on)

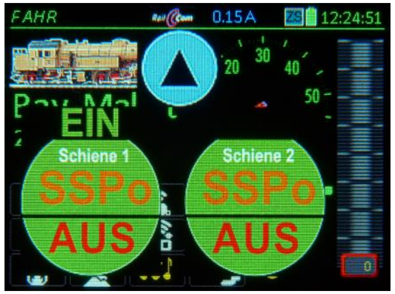
at the same time opens the "**STOP Bullets**"
with **OVC** on top

The overcurrent handling of the MX32 is principally the same as for STOPP & OFF: the two track outputs (if two are present, i.e. MX10) can be turned on again independently by touching the corresponding fields **ON** (turns track power back on) or **BCS** (=Broadcast stop), provided there is no longer a short circuit present.

NOTE: Not available in the case above is ***"OFF"***, because "OFF" has the same effect as "OVC" (cutting power to the track) and is therefore unnecessary; the touch pad "OFF" is available again, after transitioning to "BCS" or "ON".



der Schiene 1 (links)



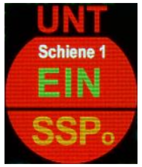
The Stop Bullets close after 1 sec. when both outputs are set to ***ON***

Undervoltage at track-1

(Track output is turned off; there is NO automatic power-on)

at the same time opens the "**STOP Bullets**"
with **UND** on top

UND therefore appears in place of **OVC.** Otherwise, the effect and procedure is the same.



STOP options when connected to an "old" command station MX1 (MX1EC; MX1HS)

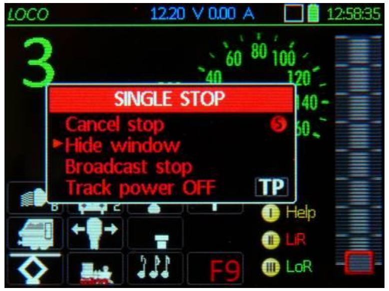
From ***LOCO***:

S-Key (short) → SINGLE STOP ▶
(= Stops the active loco)

and also: opens the **STOP window**, with the following possible further options:

Resume driving	**S-Key**
Hide window	
Broadcast stop, track 1	
Track Pwr OFF	**TP-Key**

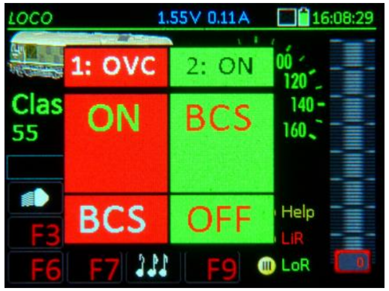
Select from the options with the scrolling wheel (or the **U-Key** to scroll down) and confirm with the **A-Key** (or without scrolling using the S or TP-Keys to go to the relevant points directly).



Resume driving **S-Key**
= Resume driving after SINGLE STOP

Hide window **A-Key**
= SINGLE STOP remains, but the window does no longer block the display content, "SINGLE STOP" is instead displayed in the header.

Broadcast stop track 1 **U + A-Key**
= Switches to BROADCAST STOP (the SINGLE STOP in this case only serves as intermediate state)



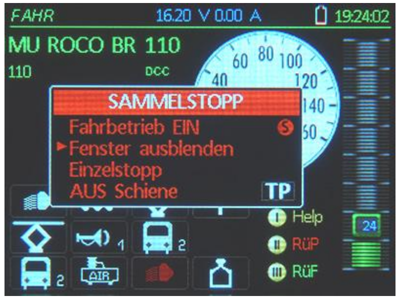
Track 1 Power OFF **TP-Key**
= Turns track power off.

SINGLE STOP is cancelled automatically when the speed slider is moved to 0 (Stop)!

S-Key (long) → BROADCAST STOP ▶
(= Stops all trains)

at the same time: opens the **BROADCAST STOP** window, with these options:
:

Resume driving	S-Key
Hide window	
Emergency stop	
Track 1 Pwr OFF	TP-Key



Currently not implemented!

Here, too, the scrolling wheel (or the U- and A-key) is used to make further selections (or S and TP-Key).

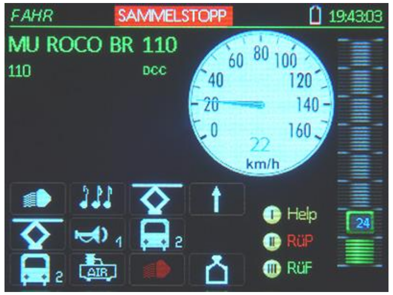
Cancel broadcast stop   **S-Key**
= Resumes driving after BROADCAST STOP

Hide window   **A-Key** ▶
= BROADCAST STOP remains but the window does no longer block the display content, "SINGLE STOP" is instead displayed in the header.

Single stop   U + **A-Key**
= Switches to EMERGENCY STOP, often after erroneous BROADCAST STOP

Track 1 (or 2 or 1+2) Pwr OFF   **TP-Key**
= Turns track power off.

> NOTE: The BROADCAST STOP actuation can be changed to "short" in ***CAB CONF*** (see chapter ***CAB CONF***), so that a broadcast stop is initiated when the S-Key is pressed briefly:
> ***S-Key (short)*** → ***BROADCAST STOP***



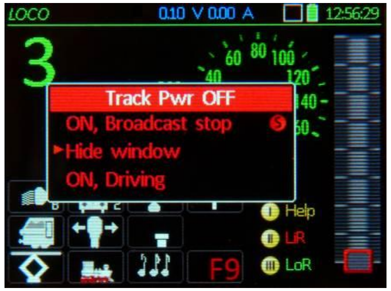
"BROADCAST STOP" and "Track Pwr OFF" **are system states** (in contrast to EMERGENCY STOP); that's why the appropriate stop window appears on all cabs; such a system state can likewise be cancelled from all cabs (**S-Key**).

S-Key (short or long) + TP-Key →Track power off ▶
(Turns track power off)

with the following options in the stop window:

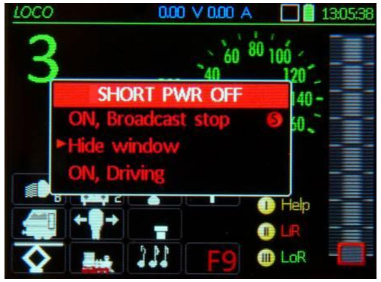
ON, broadcast stop	**S-Key**
Hide window	
OFF track 1	
OFF track 2	
OFF track 1+2	**TP-Key**

Here you can decide which track outputs should be turned OFF (if the command station has more than one track output).



Overcurrent- and short circuits at a track output ▶
OVC Track OFF

Track power is turned off automatically.
Options for further actions power OFF state.



> NOTE: The display in the stop window and their options also depend on the command station used, and may therefore differ from the above descriptions relating to the MX10; For example, with the MX1 (the "old" command station), the broadcast stop state cannot be selectively applied to the track outputs and therefore no corresponding selection is offered.

>>> STOP – Actuation sequences,

Summary, organized by initiating state:

>> Directly from the driving window LOCO:

S (short)	**→ EMERGENCY (single) STOP**	
S (long)	**→ BROADCAST STOP**	
S (short or long) + TP	**→ OFF, track 1**	only power to track output 1 is turned off
S + TP + TP (2 x TP)	**→ OFF, track 1 + 2**	fastest way to turn all track power off
S (short) + Scroll + A	**→ OFF track 1, 2 or 1+2**	Scroll in STOP window

>> From the EMERGENCY STOP window:

A-Key	→ **hide STOP window,** indication moves to header (Without scrolling because cursor is already pointing to it)
S (short)	→ **STOP cancelled,** if slider is moved away from 0: **Resumes driving**
S (long)	→ **BROADCAST STOP**
U + A	→ **BROADCAST STOP,** to issue broadcast stop after S (short) was pressed by mistake
TP	→ **OFF, track 1** only power to track output 1 is turned off
TP + TP (2 x TP)	→ **OFF, track 1 + 2** fastest way to turn all track power off

>> *From BROADCAST STOP window:*

A-Key	→ **hide STOP window,** indication moves to header (without scrolling because cursor is already pointing to it)
S (short)	→ **BROADCAST STOP** cancelled = **Resume driving**
TP	→ **OFF, track 1** NOTE: "OFF, track 2" via EMERGENCY stop menu
TP + TP (2 x TP)	→ **OFF, track 1 + 2** fastest way to turn all track power off

>> *From TRACK PWR OFF or OVC state window (after a short circuit):*

A-Key	→ **hide STOP window,** indication moves to header (Without scrolling because cursor is already pointing to it)
S (short)	→ **OFF cancelled** = power restored but with **BROADCAST STOP**
S + S (2 x S)	→ **OFF and BROADCAST STOP cancelled** = **Resumes driving**
TP	→ **OFF, track 1 + 2** Power of both tracks outputs is turned off

>> *From the LOCO window (with STOP shown in header):*

S (short)	→ **Restore STOP window**, from there continue as above
S + S (2 x S)	→ **STOP cancelled** = Resume DRIVING (from EMERGENCY or BROADCAST)
STOP S + S + S (3 x S)	→ **STOP cancelled** = Resume DRIVING after POWER OFF or SHORT!

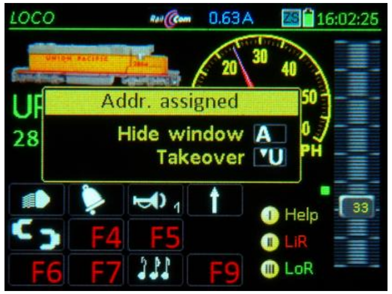
16. External and Computer Control

- **External Control** (appears in the header or window with take-over option with the **U-Key**) means that the vehicle (train...) in the display is currently controlled by another cab (hence external control); The speed slider and function keys have no effect but the screen and LED's record changes made by the other cab.
  If "external control" (or "address in use") is indicated, a TAKEOVER can be made on the relevant cab: with the **U-Key** if the "external control" (or "address in use") window is open; if "external control" is shown in the header, press any function key or move the slider.

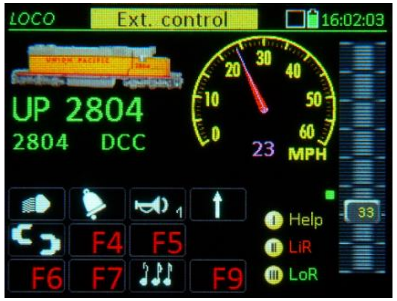
- **Computer control** appears in the header (or the name of the computer program may be shown instead, i.e. "STP"), indicating that the current vehicle is controlled by a computer (speed, direction, functions) via USB or LAN.
  In contrast to an "external cab" (external control), a computer does NOT have to go through a takeover procedure in order to send commands to the vehicle; such commands will always be executed and the changes are shown on the cabs, along with the message "Computer control". **Neither** does the cab have to go through takeover procedure to take control over the vehicle again. BUT: although a vehicle is under computer control, an operator can still send commands directly from the cab: function commands can simply be added (without losing computer control); when speed and/or direction changes are made, the message "Computer control" will be deleted; the computer recognizes when the changes are made and can take over control again if needed.

If an attempt is made to activate a vehicle address from the ***LOCO IN*** page or from the ***LoR*** memory **and this** address is already active on another controller, the

"Address in use" window appears. ▶



U

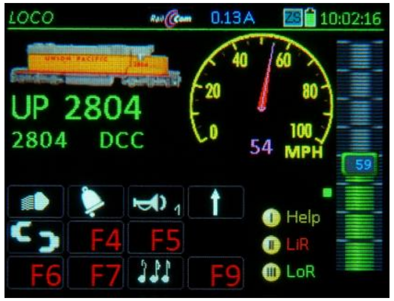


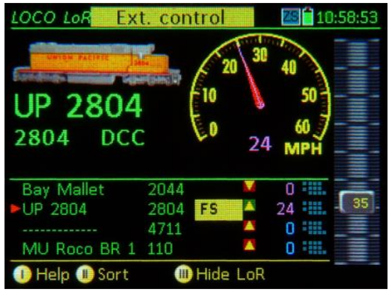
U-Key → address takeover; "steals" the address from the other controller, which in turn displays "External control" in its header.

A- Key → closes the "Address in use" window without taking over the address. The controller then moves the label "External control" to the header.

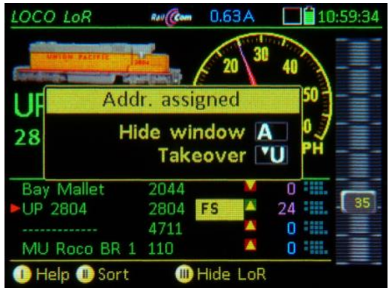
The latter (**A-Key** action) also happens automatically after a few seconds (Time-out).

A





Press any key



With "External Control" in the header it is not possible to do a direct takeover (as is possible with "Address in use"), because the **U-Key** on this screen is used to scroll through the recall memory.

In order to take over the address it is necessary to first switch to the "External Control" **window**, by either moving the speed slider, pressing any function key or the **RG-Key**. None of them have any influence on the vehicle itself but instead bring the window

◀ ***"External Control"***

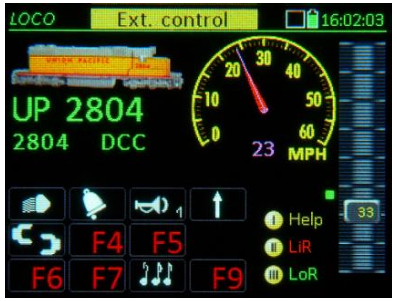
back to the front. Proceed as with "Address in use":

U- Key → takes over the address and at the same time removes it from the other controller; the other controller now displays "External Control" in its header).

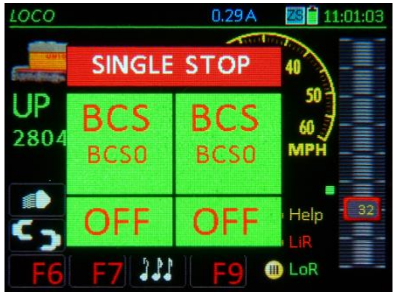
A- Key → WILL NOT take over the address; the controller returns to the warning "External Control" in its header.

A special case when pressing the **S-Key** with "External Control" or "Address in use" displayed;
In order to initiate an emergency, stop even for such an "inactive" address (without going through a takeover procedure first), the **S-Key** is effective nonetheless and does a takeover at the same time:

With "External Control": S-Key → EMERGENCY (SINGLE) STOP & TAKEOVER



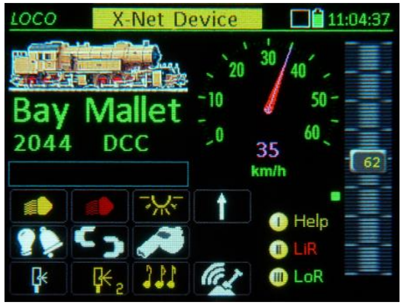
S →



The **S-Key** can also be used as a quick alternative to take over a loco when "External Control" is shown in the header, but the train IS NOT moving (i.e. speed slider at 0): Press the **S-Key** (has no effect since the train is already stopped) but the "External Control" is removed and the controller is fully functional (the address is deactivated on the other controller and "External Control" is being displayed there).

Programs (or Apps) on computers, tablets, smartphones connected via USB or LAN can intervene at any time in the control of vehicles (and, of course, accessories). No takeover procedure is necessary even if the address is actively in use by a controller. The control activities (changes in speed, functions, turnout positions etc.) are shared with each other and displayed.

To inform the user that a computer, cell phone etc. takes temporary control of a loco address, the MX32 displays “Computer control” (in the header) or – if known – the name of the application. For example, Roco Multimaus or App (X-Net Device):



This image remains until a new command is sent by the controller.

17. “Trains”

Not yet implemented!

Left blank on purpose.

18. Operating mode *SWI*

Object-oriented control of turnouts, signals…

SWI is one of two operating modes for accessory items, known as the object-oriented control of switches and signals.

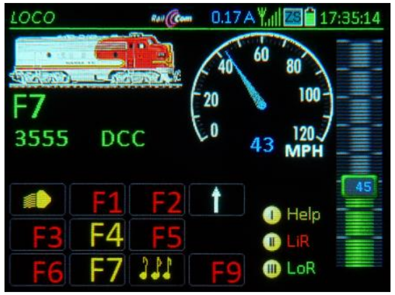
SWI ….. is accessible with the **W- Key**

The other operating mode is the "classic" **address-based** control, operated from the ***ACC LIST*** (by entering the accessory decoder address and switching the sub-address)

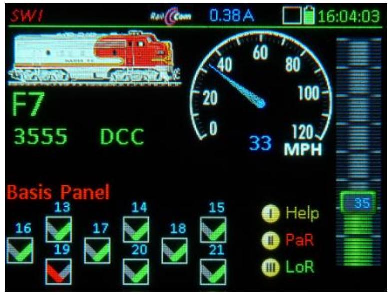
ACC LIST ….. is accessible with **E- Key + 3** ..... or **Softkey II** (from the ***LOCO*** screen)

> NOTE: To enter / switch an accessory address: **A- Key** ➞ ***LOCO IN***, type in the desired address, press the **W- Key,** which opens the ***ACC LIST:*** operate switch or signal. Return to the ***LOCO*** screen with **Softkey II**.
> For more on addressed based switching, go to chapter ***ACC LIST.***

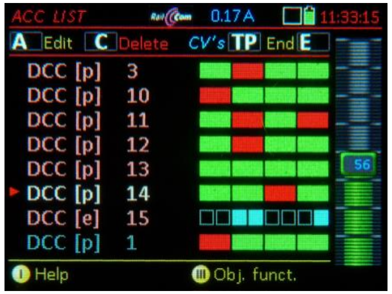
SWI is accessible from the ***LOCO*** mode and the ***ACC LIST*** with the **W-Key**:



← W →



W ↑ ↓ E + 3



```
DCC [p]  3
DCC [p]  10
DCC [p]  11
DCC [p]  12
DCC [p]  13
DCC [p]  14
DCC [e]  15
DCC [p]  1
```

In the ***SWI*** mode, the lower half of the screen is used for **turnout icons** or **dispatcher panels**. The panel icons represent **accessory articles** (the "objects"). The function keys are assigned to the icons in the panels (and with it to the accessory articles) .

Example: Icon #5 ➞ Numeric key 5 (F4)

The upper half of the screen continues to show the **active vehicle**, so driving is not influenced by using the speed slider and the keys **Ri** (Direction), **MN** (Manual) and **RG** (Shunting). The **S**-Key still operates as the stop key and **F** or **U** scroll through the vehicles.

The numeric keys **ARE NOT** available as function keys with this display.

In the object-oriented ***SWI*** mode, the function keys **DO NOT** control **addresses** of accessory decoders **but rather accessory articles** ("Objects"). These objects must first be linked to addresses / sub-addresses and other parameters in the ***SWI DEF*** screen, before they become operational in the panel for turnout switching.

Entering the ***SWI*** panel for the first time opens a sample panel named **"Basic Panel"** in the lower half of the screen and is displayed as follows:

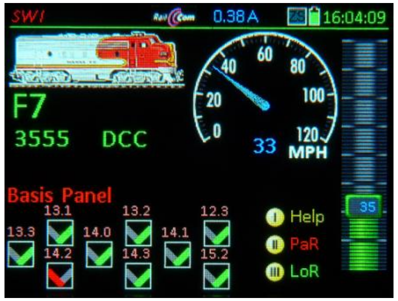
Visible are **9 turnout icons**, arranged in **3 rows**, depicted as **V-icons** *). Above each icon are the **icon numbers** (1, 2, 3…), which are only used to number the icons and are **NOT the decoder addresses**. The whole panel made up of 18 icons in 6 rows can be accessed with the scrolling wheel.

*) These special switch icons – the **"V icons"** – are not copies of actual switch board symbols and do not distinguish between right and left turnouts but rather represent the two possible positions: "right" or "left" in a simple way by means of the direction and color of a type of switch icon. They can be replaced with other icons (see ***SWI DEF***), such as right and left turnouts, signals etc.

The "Basic Panel" is often sufficient for **smaller applications** (for up to about 30 turnouts), by adapting it to the actual accessory articles on the layout. In the simplest case it is only necessary to change the decoder addresses in the respective fields and to extend the panel by adding additional icons (see ***SWI DEF***).

For a better overview over **larger layouts,** it is often better to distribute the accessory articles to several newly created panels with meaningful names, rather than using the "Basic Panel".
Examples: "Hidden station", "Station 1", "Mountain side", "Tunnel switches" etc.

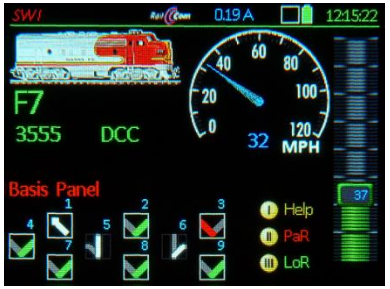
↑ (Shift)- Key ➞ **displays the decoder addresses** ▶ and sub-addresses instead of the icon numbers (MX8 are currently not supported).



> NOTE: This can be reversed on the ***CONFIG*** (**E- Key** + **0**- **Key**) page under "SWI Mode" so that the addresses are always displayed and the icon numbers are shown with the shift ↑(Shift)- Key.

Keypad ➞ actuates single turnouts or signals; alternatively via touch-screen by tapping on the corresponding icon.

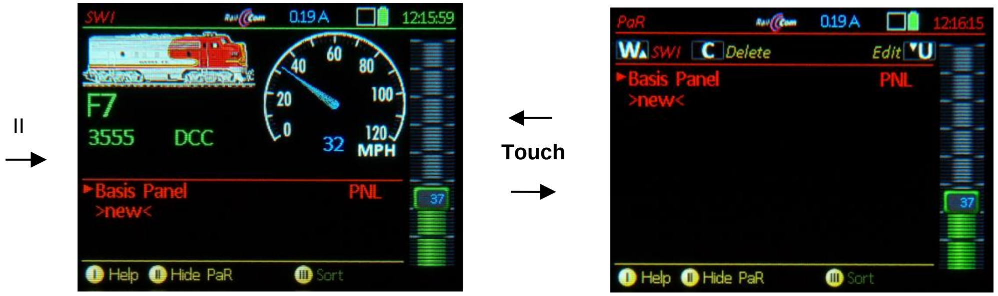
Scrolling wheel ➞ moves the panel up/down (by 1 line) to show switches 4…12 instead 1…9
▶



The key assignment has now changed to:
Icon 5 ➞ Key 2 (F1)
Icon 8 ➞ Key 5 (F4)

> The "panel" presentation also serves as a preliminary stage for a "dispatcher panel", as planned in later versions.

Softkey II PaR → opens the "Panel Recall" (**PaR**) list with existing panels, scroll & select (A), delete (C). **Tapping** the **PaR** list opens to a full-screen.



Scrolling wheel → Scroll in the list to select a panel,
Soft-Key III → Sorting options:
Scroll to panel, select with Soft-Key III, use scrolling wheel to move it to new position and press Soft-Key III again to place the panel there.
W-Key or **A-Key** → **Activates** the selected panel,
C-Key → Deletes the selected panel from the **PaR** (but not from the object database!),
U-Key → To edit the panel name.

Creating a new panel

To create a new panel, scroll to the line **>NEW<** at the end of the panel list and press the **A-Key**. If the short list is displayed at this point it will now switch to the full-page view and opens a data input window. Enter data with the keypad using the ↑-Key (Shift) to switch the keypad between "abc", "ABC" and "123".

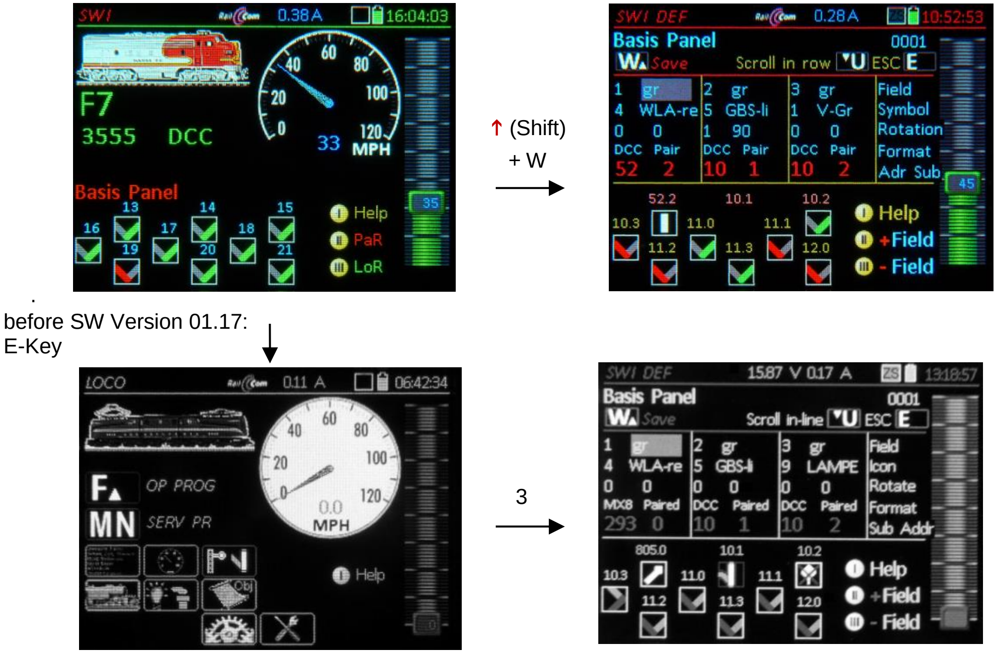
This new panel initially consists of undefined fields (Icons with "?") without any addresses assigned, which can now be replaced and edited with proper icons in the definition screen ***SWI DEF***.

A quick way to define new switch or signal objects

The idea here is to use the default "Basic Panel" to operate turnouts and two-aspect signals, using the standard "V-icons" and their default positions. Only the addresses assigned by default (10.0, 10.1…) need to be changed with the actual addresses.

↑(Shift) **+ W +** ↑(Shift) **+ U** → Enters the ***SWI DEF*** mode. The ↑ (Shift) key moves directly to the address (and sub-address) input line and the **U-Key** changes to the option "scroll in line". The addresses and sub-addresses can now be added for each icon, confirm each with the **A-key** or scroll to the next entry field.

> NOTE: Up to software version 01.18 (Oct. 2015), the ***SWI DEF*** (switch definition) screen is opened from the ***SWI*** (panel) mode with the **E-Key + number 3 key**. After software 01.18, the ***SWI DEF*** screen is opened from the ***SWI*** mode by pressing the ↑ (Shift) and shortly after (< 1 sec.) the **W-Key.**
>
> E + 3 leads, as in the operating mode ***LOCO,*** to the ***ACC LIST***.



There are three entry blocks (for three turnout icons per row) available in the ***SWI DEF*** page for icon selection, orientation, adding decoder address/sub-addresses (or modules) and other parameters. The number in the left top corner of each block indicates which icon is currently being worked on.

Scrolling wheel → highlights individual input fields for icon selection and parameters; the cursor advances automatically to the next (or previous) block when reaching the end or beginning of a block. **The panel automatically adds 3 fields when reaching the end!**

U-Key → changing the scrolling movement to "in-line mode"; instead of moving the cursor through all entry fields in each block it moves along the same line from block to block (i.e. the decoder address line); this makes it easy to quickly change the addresses and sub-addresses for each of the three icons without having to scroll through all other entry fields. Return to **"scroll in block"** with "U-Key.

Soft-Key II = **+ Field** → **adds** an additional icon field **before** the currently marked field; the marked and subsequent fields are moved down automatically.

Soft-Key III = **- Field** → **deletes** the marked field (icon) from the panel; the subsequent elements move up automatically.

Keypad, C-Key → deletes entries or individual characters in the value entry fields.

Rocker switch → select from several fixed values for input fields that don't require continuous numerical values, rather predefined values; in the cases "Icon" and "Rotate", also numbers are placed ahead of the value field, so that numerical values (with number keys) or predefined values can be entered (i.e. 0, 1, 2, 3…. or 0, 90, 180, 270 degrees for icon rotation).

Number of the icon in the panel (Object) belonging to this block (this number cannot be changed).

1 gr | 2 rg | 3 gr | Field

Color for the **function key LEDs** that indicates the turnout or signal position: r = red, g = green, y = yellow (the color is predetermined for these icons and don't need to be changed in most cases); Select with rocker switch.

Icon design number (if the number is known for the desired icon it can be entered directly to this field, using the numeric keys).

5 WLA-li | 2 V-inv | 6 WSF-re | Icon

Description of the desired icon for the panel field (permanently linked to the number on top); immediately visible in the corresponding panel field; Select with the rocker switch.

If this input field is highlighted (not the number field ahead of it), the function keys can be used to test the looks of the icon in all positions (all icons, including the one being edited).

Rotation angle (icon orientation, the numerical entry of the desired angle is also possible).

2 180 | 1 90 | 0 0 | Rotate

Description of the desired rotating angle for the icon; immediately visible in the corresponding panel field; select with the rocker switch.

Data format (DCC, MM, MX8, StEin, Q-Dec, Z-mode0, Z-mode4); Select with rocker switch.

DCC Paired | DCC Single | MX8 Paired | Format

Paired, **Single function** or **Sequence**, for is turnouts or red-green signals (paired functions), light bulb (single function) or multi-aspect signals (to call up sequences of 3, 4, 5… signal aspects one by one with one key). Select with rocker switch ("Paired", "Single", "Seq-3", "Seq-4"…"Seq-8").

For this input field an automatic suggestion is made on the basis of the icon selected above, a change is usually not necessary.

Enter the **accessory decoder address** (1…511), MX8 address (0 … 63), or StEin address

10 0 | 10 1 | 12 3 | Sub Addr

Enter the **sub-address** of the accessory decoder address or the respective MX8.

The following **object icons** are available for the switch panels. They are selected in the ***SWI DEF*** screen within the second row of each data input block and displayed in the panel field. More icons may be added to this basic set with future software updates.

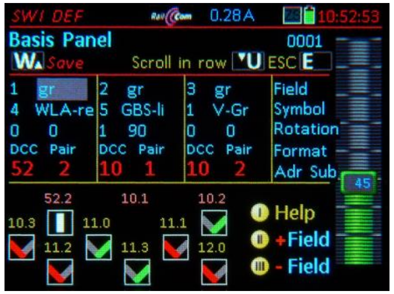
Icon Number	*Label in the input block*	*Description*	*Graphical representations*
1	V norm	V-Symbol normal (default)	
2	V inv	V-Symbol red-green inverted	
3	WLA-li	Switch lantern, Left switch	
4	WLA-re	Switch lantern, Right switch	
5	WSF-li	Switch icon, Left switch	
6	WSF-re	Switch icon, Right switch	
8	LAMPE	Single light, ON/OFF function	
9	SIG-2	Two aspect signal (red/green)	
10	SIG-3	Three aspect signal (green/red/yellow)	

When all changes in the ***SWI DEF*** are made:

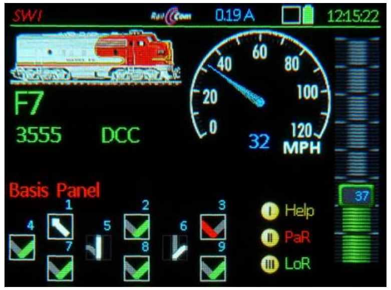
W- Key → **Saves** the newly entered data (i.e. addresses), exits the definition screen and returns to the **operating screen *SWI***.

E- Key → **Exits** the definition screen WITHOUT saving, returns to the ***SWI*** mode.

***Examples** of definition (**SWI DEF**) and operating screens (**SWI**) with different icons etc.*


SWI DEF 0.28A 10:52:53
Basis Panel 0001
W Save Scroll in row U ESC E

```
1   gr       2   gr      3   gr     Field
4   WLA-re   5   GBS-li  1   V-Gr   Symbol
0   0        1   90      0   0      Rotation
DCC Pair     DCC Pair    DCC Pair   Format
52  2        10  1       10  2      Adr Sub
```


SWI 0.19 A 12:15:22
F7
3555 DCC
32 MPH
Basis Panel

Signals & Signal aspects in SWI

Not yet implemented!

1. **Considering the most important signal aspects of the Q decoders**:

- The most important Austrian, German, Swiss… signals are added to the symbols
- Q decoders themselves are set by the Q-programmer or by direct CV programming
- MX32 Panel DEF: When scrolling the signal icons, a magnified icon is displayed for 1 second; with inscription (for example "DB exit signal"), and possibly information on the number of lights (Note: A connection diagram is not possible, because this is defined in the Q-Decoder)
- The smaller icon is displayed in the panel itself, with overlapping light points; rather not true to the prototype because of lack of space.
- The symbol also automatically sets the parameter single-pair-sequence correctly, but this can also be changed manually.
- MX32 Panel DEF: input of the first address (and sub address) as defined by the Q decoder, i.e. the red light.
- Signal switching: the possible signal aspects are displayed one after the other with the assigned key (a magnified icon in each case for 1 sec and small continuous) and the corresponding commands sent to Q decoder with a small delay, so that no overlapping aspects are created.
- Unclear: Should darkening depend on other signals (or must it be included as a separate "signal aspect" in the sequence).

2. **Signals connected to the light outputs of the MX820, MX821 decoders in control mode = 0**

- Based on the previous inclusion of the Q decoders, i.e. icons, handling and selection of icons are used together.
- MX32 Panel DEF: A MX820 or MX821 decoder has two "sub addresses" (in control mode 0); one of them is entered to the input field.
- Connection diagrams for the individual signal types are provided (in the operating instructions of the decoder or the controller); the signals must be connected accordingly.
- The correct CV values in the decoder for the selected icon must be programmed automatically. With ZIMO decoders (as opposed to Q-Decoder), this can be done in OP mode via RailCom!
- Signal switching with Q decoders!

3. **Signals connected to the light outputs of the MX820, MX821 decoders in control mode = 4**

- Building on the points 1. and 2., i.e. common icon and handling.
- The CV values in the decoder of the selected icon must be programmed automatically. In the control mode 4 (as opposed to 0), however, the programming must apply to the decoder address, which is not the same as the object address of the signal, but the object address is to be programmed as well.

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19. *ACC LIST*

Address-oriented control of turnouts, signals …

…is an alternative to the ***SWI*** method of operating accessory articles, similar to the usual method of earlier system generations.

The ***ACC LIST*** can only be reached from the driving mode ***LOCO*** (NOT from the ***SWI*** mode) with

Soft-Key II = ***LiR **** ➞ Opens the ***ACC LIST*** in the lower screen half,

or

E-Key + 3-Key ➞ ***ACC LIST***

Accessory decoder addresses can be entered in the operating mode ***ACC LIST*** and associated turnouts and signals can be operated, or existing addresses (entered automatically, see below) monitored and operated when needed.

The function keys do NOT operate loco functions as long as the ***ACC LIST*** is displayed. However, the active vehicle in the upper screen half can still be controlled (Speed, direction…).

All addresses assigned to ***SWI*** panels are automatically added to the ***ACC LIST,*** but can be removed from the list if they are not desired here without changing the functionality of the panel. If a MX8 is in the system it also appears automatically and can be operated directly by using the function keys.

To add a **new** (additional) **address** it is necessary to scroll to the line **>New<**, then:

- **Scrolling wheel:** Move the cursor to the line **>NEW<**
- **A-Key:** "DCC [p]" (DCC with 4 paired functions per address (=p)) is the standard definition, if changes are required such as single functions proceed with the
- **Rocker switch** to change to:
  "DCC [e]" (8 single functions per address), often for double-slip switches
  "DCC [x]" (extended)
  "MM1 [e]" (Motorola; 8 single functions per address)
  "MM1 [p]" (Motorola; paired)
- **A-Key:** confirms and opens the accessory address input field, then use
- **Numeric keys** to enter the new address and confirm with the
- **A-Key:** saves the new entry (address) and adds it to the ***ACC LIST***.
- ***TP-Taste*** ➞ CV programming

Already **existing addresses** can be edited the same way (scroll to line, A-Key…)

Operating accessories (only if ***ACC LIST*** is open):

- **Scrolling wheel:** scrolling up/down in the accessory list
- Numeric keys 1 – 4 or 1 – 8: operate 4 turnouts (or 8 single functions) …

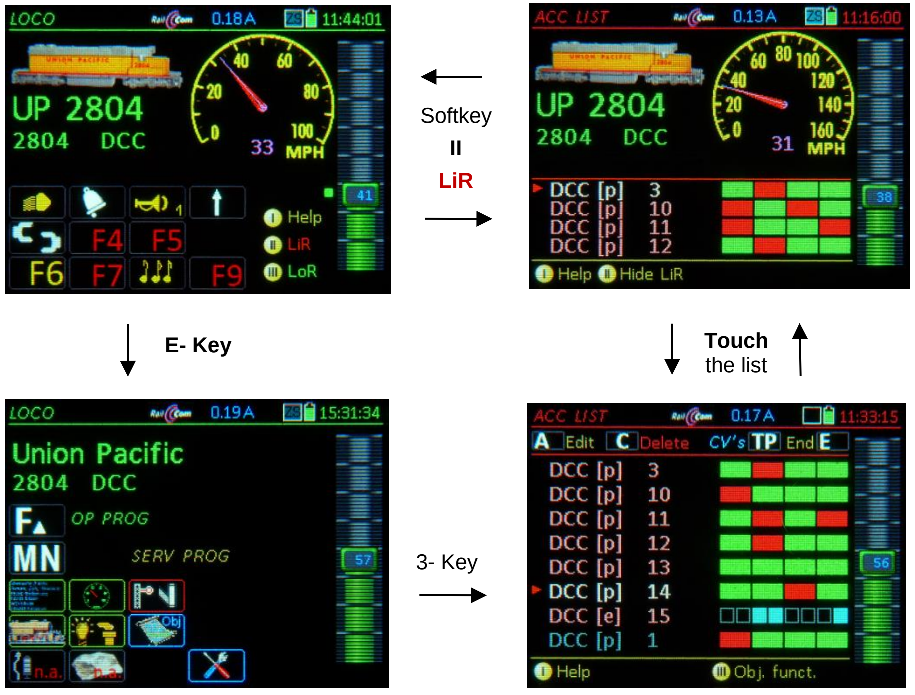
DELETE entries and EXIT this operating mode:

- **C-Key:** deletes the highlighted line from the ***ACC LIST***
- **Soft-Key II:** Closes the ***ACC LIST*** and returns to ***LOCO***.

> NOTE: **Softkey III** ➞ Programing window, this is only functional if a MX8, MX9 or StEin module is connected.

The following functions are still available even with the ***ACC LIST*** open:

U- / F- Key ➞ Scrolls among locomotives (within the ***LoR***) without leaving this screen.
TP- Key ➞ Consist functions as in the ***LOCO*** mode (except where the ***LoR*** must be open)
↑ (Shift) + **A- Key** ➞ ***LOCO IN*** (to enter a new vehicle address).
E- Key ➞ ***E-menu screen***



Alternative, quick method of entering a new accessory address:

Directly from the operating screen ***LOCO***:

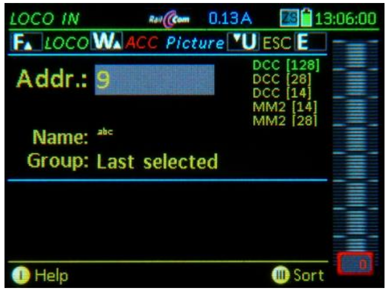
A- Key ➞ ***LOCO IN***

"Misuse" of the ***LOCO IN*** screen: After entering the new address DO NOT press the F-Key, but rather the

W- Key ➞ confirms and jumps directly to the address in the ***ACC LIST*** = operate the accessory or use the

A- Key ➞ for editing (i.e. to change to "DCC [e]" or change the address), then

Softkey II ➞ ***LOCO***



*) LiR: (accessory) List Recall memory

20. StEin LIST

Monitoring and operating stationary equipment,
connected to StEin-modules.

ZIMO "StEin" modules used for stationary equipment of the model railroad layouts, especially **track sections** (with occupancy and overcurrent detection, HLU, RailCom), as well as **turnouts**, **signals**, **uncouplers**, **inputs** (track contacts, reed switches, photocells…) and **speakers.**

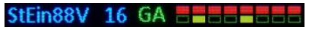
The ***StEin LIST*** is accessible from the operating mode ***LOCO*** or ***SWI*** with the:

E- Key + 8 ➞ ***StEin LIST***

All existing StEin modules in the system are arranged in the ***StEin LIST*** according to module numbers and represented by one line each; depending on the chosen representation (half or full screen), more or less modules are visible at the same time. **Tap** anywhere on the list to switch between these two representations.

↑ (Shift)- **Key** (Short) ➞ Switch between the display line levels for track sections, turnouts, signals or inputs. The respectively displayed elements can be actuated with the function keys.

GA – Track sections:


StEin88V 16 GA

For each of the 8 track connections is shown:

- the active HLU state (multi-color dot, similar to the red-green LED on the module),
- the occupancy detection (yellow dot, similar to the to the yellow LED on the module),
- overcurrent and short circuit states (blue dot, similar to the blue LED on the module),

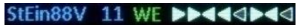
The display logic of the luminous dots is modeled on the LED's next to the screw terminals of the module's track outputs, although not identical for practical reasons.

The track section HLU states can be switched from the controller:

- BRIEFLY press the corresponding number key ➞ up by one step (i.e. H➞UH, HU➞U etc.),
- PRESS/HOLD the corresponding number key ➞ opens a list of the HLU states;
  select another state with a number key

Repower a track section after a short circuit with the number key!

WE – Turnouts or single outputs:


StEin88V 11 WE ▶▶◀◀◁▶◀◁

For each of the 8 turnout outputs (2 pins each) is shown:

- the current turnout setting is displayed by an arrow, which depending on feedback, is either colored or blank; Flashes until the desired position is reached (i.e. with motorized turnouts) or when malfunctions occur.

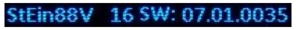
The turnouts can be switched from the controller with the:

- corresponding number keys ➞ switches turnout back and forth

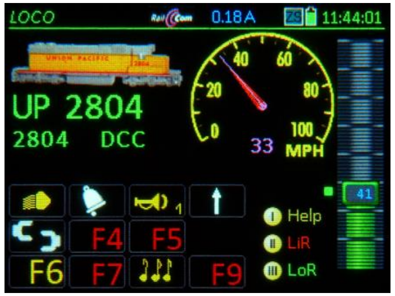
IN – Switch inputs: for each of the 16 switch inputs is shown:

- the current state (green dot means ON).

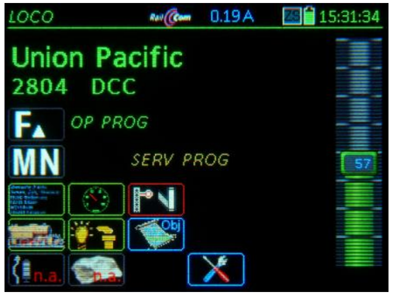
↑ (Shift) - Key LONG ➞ shows software versions of ALL StEin modules in the list;
(for a quick overview)


StEin88V 16 SW: 07.01.0035

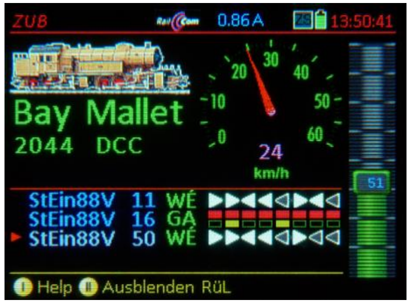
DETAILS WILL BE ADDED LATER.



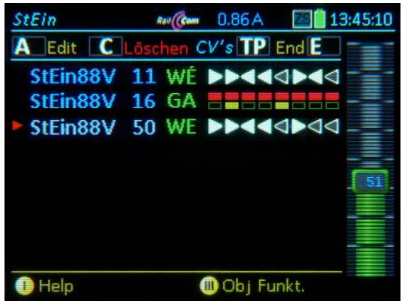
E- Key



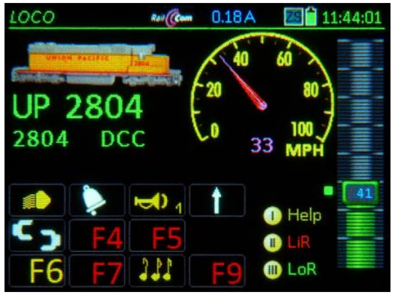
E+8



Tap on the list
to switch from half
to full screen display



21. Programming in Service Mode: SERV PROG



= “Service Mode Programming”, that is,
programming on the programming track

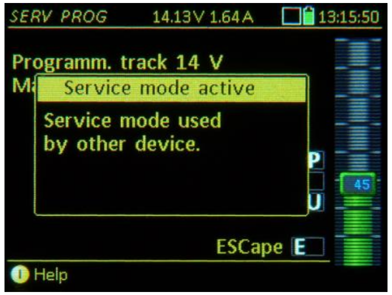
SERV PROG can be reached with the

E- Key (to the E-screen) + **MN-Key**
(pressed in quick succession)

WILL BE ADDED LATER.

The *SERV PROG* Help-File accessible with **Softkey I**. ▶

Other controllers indicate that the command ▶ station’s track output 2 is in Service Mode (provided the command station has two track outputs, otherwise the device itself).



Programm. track 14 V

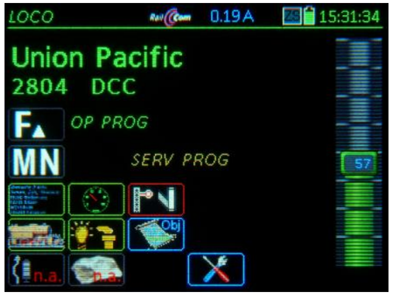
Service mode active

Service mode used by other device.

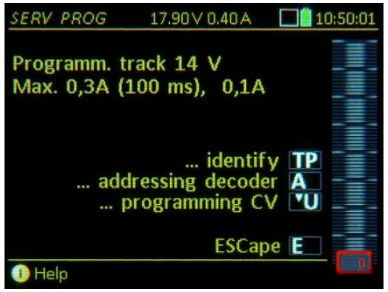
E- Key → Exits the *SERV PROG* mode

If the **E-Key** is pressed within the work area “Addressing” or “CV-Programming”, it returns first to the programming menu screen, a SECOND **E-Key** actuation exits the *SERV PROG* mode.

E



MN



Programm. track 14 V
Max. 0,3A (100 ms), 0,1A

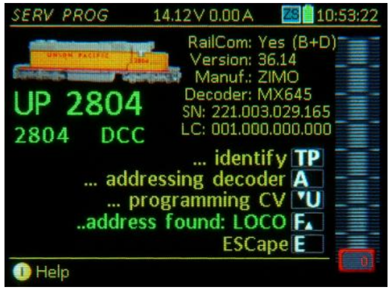
The first screen after entering the *SERV PROG* mode (with E + MN keys) is the programming menu, which also functions as a “security question” to prevent accidental deletion of decoder addresses or data.

Here, the currently applicable parameters of the command station’s programming track are also displayed (if this is a MX10) such as maximum track voltage, maximum current etc., and that they correspond with the standard of the VHDM ("Rail Community") standard. However, these settings can be changed in the MX10 if needed (under "VOLT & AMP DETAIL, section " SERV"). This is necessary when a decoder or a vehicle with installed decoder consumes more quiescent current during programming than the "Rail Community" intended.

The keys displayed in the programming menu lead to the actual working areas:

TP- Key → **identifies** the decoder on the programming track with its address and displays it with name and image, if present in the object database. Additionally, some other important information such as manufacturer ID, decoder type, SW version and decoder ID is read and displayed (the latter points only if it is a decoder manufactured by ZIMO).

TP



RailCom: Yes (B+D)
Version: 36.14
Manuf.: ZIMO
Decoder: MX645
SN: 221.003.029.165
LC: 001.000.000.000

If the decoder is identified as a ZIMO product, advanced programming support is available by displaying descriptions for the special ZIMO CVs (otherwise only DCC standard CV descriptions).

F- Key → (now that the address is known by decoder identification or address read-out) activates the newly recognized address and switches over to the driving mode ***LOCO***

TIP: This is a quick way to test a vehicle on the programming track if the address is not known.

> NOTE: The identification procedure (which may take several seconds) **can be aborted** at any time with the **E-Key, U-Key or F-Key.** This is useful if only the first few lines of information are of interest.

The decoder **identification** with the **TP-Key** is, however, **NOT necessary** for changing the address or CV programming; the **A-Key** for address programming (or A+A for reading the address) or the **U-Key** for CV programming can be used immediately (without knowing the address). All this is possible in the service mode without actually knowing the address, which of course carries a certain risk.

A- Key ➞ starts the working area **Address Programming**;
Here, either press the A-Key again, ➞ to **read** the current decoder address, or enter **a new address** and press the F-Key or W-Key ➞ to **write** (program) the new address into the decoder; see below.

U- Key ➞ starts the working area **CV-Programming**; where CVs can be programmed or read-out; details see further down in this chapter!

E- Key ➞ **exits** Service Mode Programming (switches back to ***LOCO*** with the previous address; in contrast to the **F-Key** where the identified address will be activated).

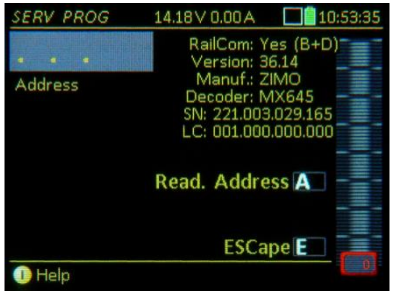
SERV PROG – Decoder address programming *(after **A- Key**)*

If the step "…identify decoder" (with **TP-Key**) was performed before calling for "…program new address" (with **A-Key**), the current address and the other data are already known by the controller and displayed next to the address input field (until now: …) ▼

NOTE: During the actual addressing procedure the necessary data is always read out (especially CV #29), even if previously "identified", because the system can only recognize in this way whether the decoder on the programming track has possibly been replaced with another one.
The foregoing "identification" is therefore not really necessary for programming an address but does offer more information.
If only the "old" address is of interest, it can be read out directly (by pressing the A-Key again, see below); this is also faster than the decoder "identification".

A

(in this example AFTER identific-ation with TP)



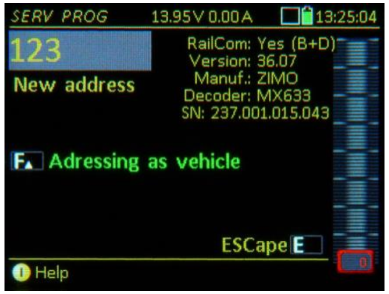
SERV PROG 14.18V 0.00A 10:53:35
Address
RailCom: Yes (B+D)
Version: 36.14
Manuf.: ZIMO
Decoder: MX645
SN: 221.003.029.165
LC: 001.000.000.000
Read. Address A
ESCape E
Help

Type a new address in the entry field and press the

F- Key ➞ **programs** the decoder to the new address as **a vehicle** decoder
W- Key ➞ **programs** the decoder to the new address as **an accessory** decoder

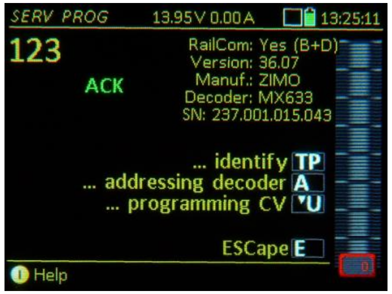
In the case shown here (where the decoder was first "Identified" with the **TP key**) only one of these options (**F** or **W-key**) appears because the type of decoder (vehicle or accessory decoder) on the programming track is already known, due to a successful "identifying" or "address read-out" procedure.

As for the other case, see further down in the text: "Program decoder WITHOUT "Identification".



SERV PROG 13.95V 0.00A 13:25:04
123
New address
RailCom: Yes (B+D)
Version: 36.07
Manuf.: ZIMO
Decoder: MX633
SN: 237.001.015.043
F Adressing as vehicle
ESCape E
Help

➞
F



SERV PROG 13.95V 0.00A 13:25:11
123
ACK
RailCom: Yes (B+D)
Version: 36.07
Manuf.: ZIMO
Decoder: MX633
SN: 237.001.015.043
… identify TP
… addressing decoder A
… programming CV U
ESCape E
Help

After programming an address (or attempted programming) with the **F** or **W-Key**, one of the following confirmation messages appears:

ACK for a successful (= confirmed) programming step, or

NACK in cases where no confirmation was returned by the decoder. The associated alert "ATTENTION: Addressing not confirmed" means: the decoder did not send acknowledgement pulses, but the address MAY have been programmed successfully anyway, BUT: it IS ALSO POSSIBLE that the address was programmed correctly but the previous CV #29 values were changed to ZIMO default values; this could affect the speed step mode (ZIMO default: 128), analog control (ZIMO default: yes) and RailCom (ZIMO default: yes).

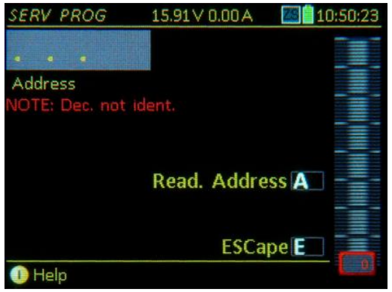
ERR the decoder has rejected the (address) programming step

The MX32 screen also displays which CVs have been set to what values with the previous address procedure, each with ACK / NACK

NOTE Replacing the decoder or vehicle on the programming track with another one without exiting and re-entering the ***SERV PROG*** mode is permitted and can be quite useful for saving time during "mass" address programming. In such a case, take the decoder (or vehicle) from the programming track after a successful programming process (confirmed with **ACK**, see above), connect the next decoder to (or place the next vehicle on) the programming track and continue with the A-Key, type in the new address and press the F-key.

Programming decoders WITHOUT preceding "Identification" (***A- Key*** *w/o preceding* ***TP- Key***)

In this case, the usual list of data is not shown, instead the warning: "ATTENTION: Unidentified Decoder – Address programming is not safe ".



SERV PROG 15.91V 0.00A 10:50:23
Address
NOTE: Dec. not ident.
Read. Address A
ESCape E
Help

This means: it is NOT (yet) CERTAIN whether

1) a decoder or vehicle with decoder is even on the programming track
2) the decoder is of the proper type (for a vehicle or accessory) that can be programmed with the **F-Key** or **W-Key**
3) it is a ZIMO or third-party decoder (important in relation to CV #29 default values) or
4) it is even possible to communicate (read/write, with or w/o acknowledgment) with the decoder on the programming track.

However, the warning "ATTENTION: Unidentified Decoder" does NOT mean that programming or read-outs with acknowledgments are not possible, but only that there is an uncertainty in this regard.

The "deficiency" of a missed identification can either be rectified with the

A- Key (which is the second A-Key actuation, and equivalent to A+A) ➞ to **read out** the address, (which is sufficient for a "minimal identification" that allows for a secure address programming)

or

not rectified by immediately programming the new address unsecured, at one's own risk by typing in the new address and confirming it with the **F** or **W-Key**..

If the decoder type is **not known**, it is up to the **user to press the CORRECT key (F or W).** The WRONG button either prevents a successful address programming (namely when the decoder is able to acknowledge it, is read-out within the addressing process and thereby recognizing the key as the wrong one) or a failed programming (if the decoder cannot acknowledge - e.g. because no load is connected).

SERV PROG – CV - Programming *(after pressing the **U-** **Key**)*

After entering "CV-programming" (with the **U-Key**), the **first input line** is the first editable. If CV programming is entered WITHOUT prior decoder identification, the message "… unidentified decoder" will appear. The key sequences for programming are as follows:

… Program a CV by

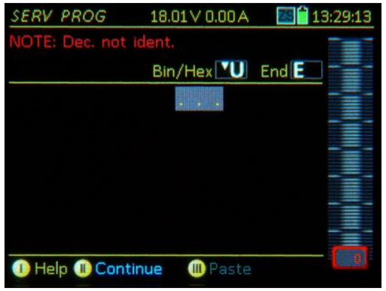
Typing a CV number – **A-Key** – Enter a CV value – **A-Key**

… Read-out a CV by

Typing a CV number – **A-Key** – (again) **A-Key**

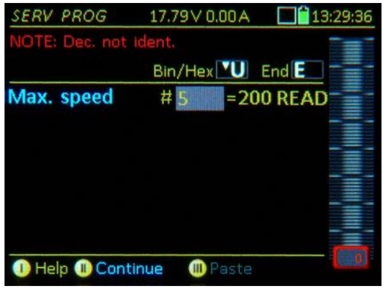
U

(in this example AFTER identification with TP or A+A)



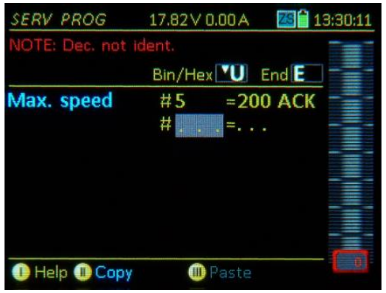
SERV PROG 18.01V 0.00A 13:29:13
NOTE: Dec. not ident.
Bin/Hex U End E
. . .
Help Continue Paste

5 →



SERV PROG 17.79V 0.00A 13:29:36
NOTE: Dec. not ident.
Bin/Hex U End E
Max. speed # 5 =200 READ
Help Continue Paste

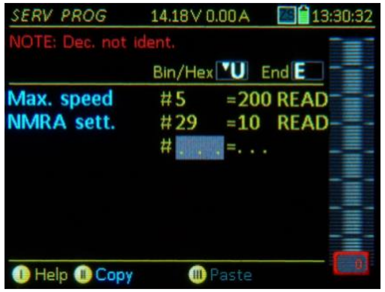
A



SERV PROG 17.82V 0.00A 13:30:11
NOTE: Dec. not ident.
Bin/Hex U End E
Max. speed #5 =200 ACK
. . . =. . .
Help Copy Paste

→

266 A, 45 A, 277 A, 100 A



SERV PROG 14.18V 0.00A 13:30:32
NOTE: Dec. not ident.
Bin/Hex U End E
Max. speed #5 =200 READ
NMRA sett. #29 =10 READ
. . . =. . .
Help Copy Paste

CV programming success (or failure) report at the end of each line after completion with the **A key**:

ACK successful CV programming (acknowledged)
READ CV value read out successfully
NACK programmed without acknowledgement
NO-R CV read-out failed

An automatic line feed occurs after each programming or read-out step in order to immediately proceed with the next CV. Use the

Scrolling wheel → to edit values or CV numbers of previously edited lines,

C-Key → to delete the highlighted number (CV number or value), then enter a new value in the field followed again with the A-Key; the process of correcting a line is the same as entering to a new line (see above).

The following actions can be taken at any time during CV programming:

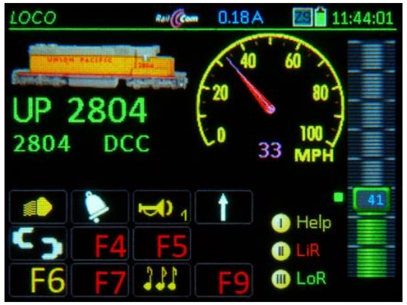
F-Key → **activates** the vehicle and switches to the *LOCO* mode (only when the address is known, i.e. if the decoder was identified with the TP-Key or address read-out with A+A, before starting the CV programming).

E-Key → **returns** to the programming menu screen and pressing the E-Key again returns to the screen the controller was in before entering *SERV PROG*, which is usually the *LOCO* or *SWI* mode.

U-Key → opens an editing window for the CV currently worked on, to turn individual bits ON/OFF, some important CVs come with a description and a hexadecimal representation.

F

(from the CV-Prog window)



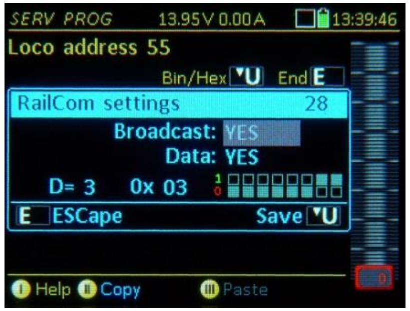
LOCO 0.18A 11:44:01
UP 2804
2804 DCC
33 MPH
F4 F5
F6 F7 F9
Help LiR LoR

.

▼ *Examples*

U

(on CV 28)

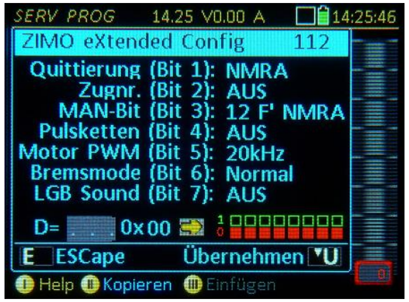


SERV PROG 13.95V 0.00A 13:39:46
Loco address 55
Bin/Hex U End E
RailCom settings 28
Broadcast: YES
Data: YES
D= 3 0x 03
E ESCape Save U
Help Copy Paste

NOTE: In many cases, the individual bits have no standardized meaning and can be used differently by the decoder manufacturers. Therefore, full names of some CVs are only available if the decoder was previously identified (**TP-Key**) as ZIMO decoder.

U

(on CV 112)



SERV PROG 14.25 V0.00 A 14:25:46
ZIMO eXtended Config 112
Quittierung (Bit 1): NMRA
Zugnr. (Bit 2): AUS
MAN-Bit (Bit 3): 12 F' NMRA
Pulsketten (Bit 4): AUS
Motor PWM (Bit 5): 20kHz
Bremsmode (Bit 6): Normal
LGB Sound (Bit 7): AUS
D= 0x00
E ESCape Übernehmen U
Help Kopieren Einfügen

SERV PROG – Creation and use of CV - Sets

…. using the clipboard:

Softkey II = **Continue** ➞ (appears when entering the CV programming mode after a previous programming session with the same address).
Displays the programmed and read-out CV lines from the last session again (i.e. CV 29 = 10 READ, etc.).

> NOTE: there is no automatic control whether the values still match what is in the decoder. CV writing and reading were already carried out in the previous session and are now listed again for overview and correction.

Soft-key II = **Copy** ➞ copies all CV lines (i.e. CV #29 = 10, etc.) from the current screen view to the clipboard. Copying serves primarily to transfer a group of CVs (a "CV-Set") from the decoder currently worked on to another.

Soft-key III = **Paste** ➞ The CV lines from the clipboard (i.e. CV #29 = 10, etc.) are pasted to the current screen. See notes above for Soft-Key II = Copy.

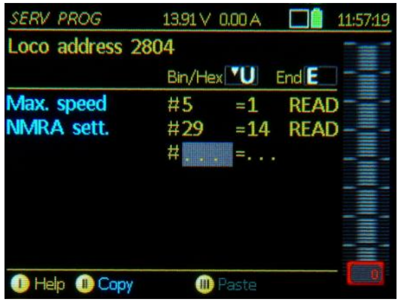
> **ATTENTION**: With the "Paste" command, the CV-lines are only added to the list but NOT yet sent to the decoder. This must be carried out afterwards for each individual line; that is, in practice:

A-Key (after scrolling to the first line) ➞ repeat for each CV number and value (other than pressing the A-Key, no further actions are required, except when a line is to be skipped), then the confirmation **ACK** appears in each line if the programming step was successful.

…. from and within the CV-Set-Memory:

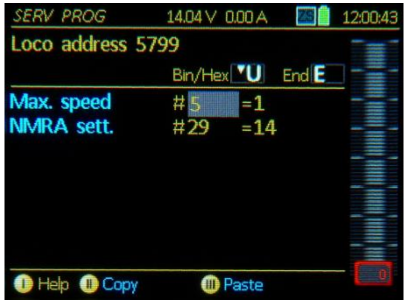
In contrast to the clipboard (for one single CV set) an (almost) limitless number of CV-sets is managed by the CV-set memory, stored by theme with freely definable names and descriptions. A number of CV-sets is included from the outset in the controller and more can be added via flash drive (as part of the general controller software updates or independent thereof)

↑ (Shift) ➞ switches the Soft-Keys II and III from the above clipboard application (II = copy, III = paste) to the CV-set application; recognizable by changing to a blue font:
II = copy CV-Set III = paste CV-Set



```
SERV PROG      13.91 V  0.00 A      11:57:19
Loco address 2804
                  Bin/Hex U   End E
Max. speed        #5    =1    READ
NMRA sett.        #29   =14   READ
                  # . . .  =. . .
I Help  II Copy        III Paste
```

↑ →



```
SERV PROG      14.04 V  0.00 A      12:00:43
Loco address 5799
                  Bin/Hex U   End E
Max. speed        #5    =1
NMRA sett.        #29   =14
I Help  II Copy        III Paste
```

An active shunting mode (R-key engaged) is automatically terminated when calling the CV-programming screen (OP PROG and SERV PROG)!

Soft-Key II = Copy CV-Set ➞ Saves the CV rows of the current screen to the CV-Set memory:

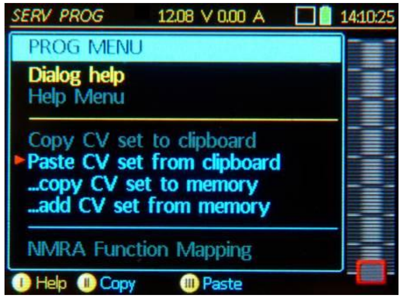
A CV-Set input window opens.

Theme: Select one of the suggested themes (with toggle switch).

Name: Enter a name of your choice.

Info: Free choice of text.

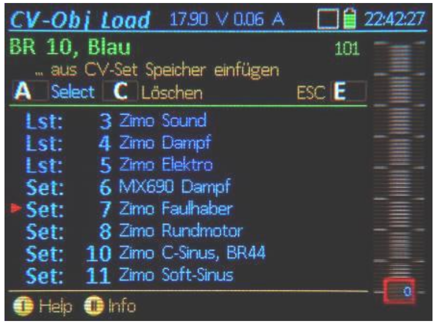
↑-Key + A-Key ➞ **SAVE**
(Attention: otherwise the CV-Set is not saved).



```
SERV PROG      12.08 V 0.00 A      14:10:25
PROG MENU
Dialog help
Help Menu
Copy CV set to clipboard
▸Paste CV set from clipboard
...copy CV set to memory
...add CV set from memory
NMRA Function Mapping
I Help  II Copy     III Paste
```

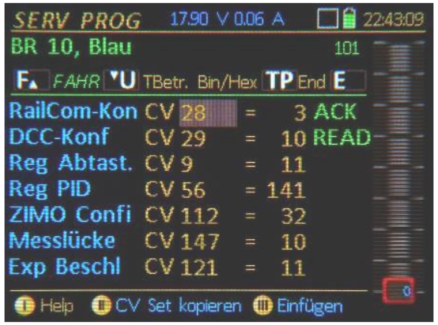
Soft-Key III = Paste… ➞ Search for the desired CV-Set in the CV-Set database and paste the CV-set rows to the current display screen.

II



```
CV-Obj Load   17.90 V 0.06 A      22:42:27
BR 10, Blau                          101
 ... aus CV-Set Speicher einfügen
A Select  C Löschen            ESC E
 Lst:   3 Zimo Sound
 Lst:   4 Zimo Dampf
 Lst:   5 Zimo Elektro
 Set:   6 MX690 Dampf
▸Set:   7 Zimo Faulhaber
 Set:   8 Zimo Rundmotor
 Set:  10 Zimo C-Sinus, BR44
 Set:  11 Zimo Soft-Sinus
I Help  II Info
```

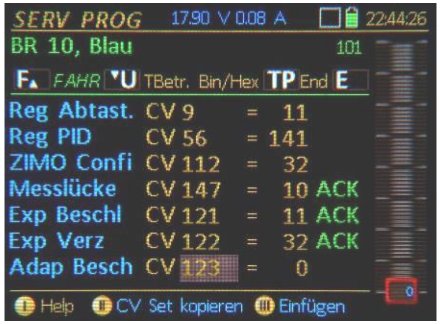
A
→



```
SERV PROG     17.90 V 0.06 A      22:43:09
BR 10, Blau                          101
F FAHR  U TBetr. Bin/Hex TP End E
RailCom-Kon  CV 28   =    3 ACK
DCC-Konf     CV 29   =   10 READ
Reg Abtast.  CV 9    =   11
Reg PID      CV 56   =  141
ZIMO Confi   CV 112  =   32
Messlücke    CV 147  =   10
Exp Beschl   CV 121  =   11
I Help  II CV Set kopieren  III Einfügen
```

> ATTENTION: With the "Paste" command the CV-lines are only listed but NOT yet sent to the decoder. This must be carried out afterwards for each individual line; that is, in practice:

A- KEY (after scrolling to the first row) ➞ for each CV number and value (other than A, no further actions are to be taken, except when a row is to be skipped), then the confirmation **ACK** appears in each row if the programming step was successful. ▶



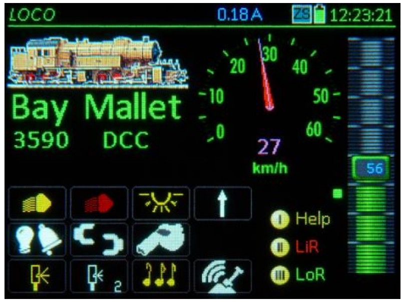
```
SERV PROG     17.90 V 0.08 A      22:44:26
BR 10, Blau                          101
F FAHR  U TBetr. Bin/Hex TP End E
Reg Abtast.  CV 9    =   11
Reg PID      CV 56   =  141
ZIMO Confi   CV 112  =   32
Messlücke    CV 147  =   10 ACK
Exp Beschl   CV 121  =   11 ACK
Exp Verz     CV 122  =   32 ACK
Adap Besch   CV 123  =    0
I Help  II CV Set kopieren  III Einfügen
```

CV-List vs. CV-Sets:

CV Set: Each line consists of the CV-number and the CV value (e.g. CV 29 = 10)

CV-List: The CV-lines are stored without values and are therefore also inserted without values; they must be filled line by line and serve as a template for the complete coverage of all CVs for a specific topic (e.g. parameters necessary for motor control).

22. *Programming in Operational Mode: OP PROG*



= “Operational Mode Programming“
also known as “Programming on the main” (POM) or “Programming on-the-fly”.

OP PROG is started from the driving mode ***LOCO*** or ***SWI*** with

E- Key (to E-screen) + **F- Key**

In contrast to ***SERV PROG***, the ***OP PROG*** always refers to the currently active address displayed on the controller and therefore it is not necessary to enter or read-out the address first.

The Help-File for ***OP PROG*** can be reached with Soft-Key I: ▶

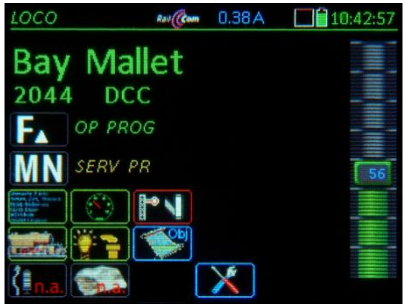
Will be given later

E- Key ➞ Exits the ***OP PROG*** mode.

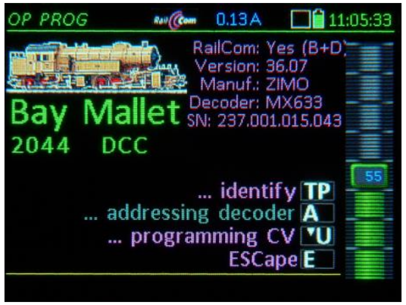
If the E-Key is pressed within the working area of address or CV programming, the program switches back to the programming menu first; only a SECOND **E-Key** actuation exits ***OP PROG*** completely.

This PICTURE will be REPLACED later

E



F ⟶



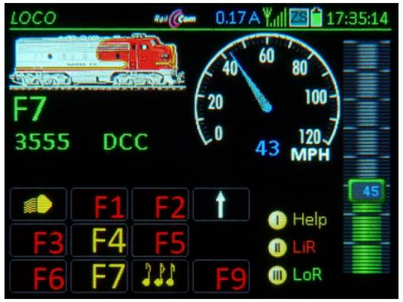
RailCom: Yes (B+D)
Version: 36.07
Manuf.: ZIMO
Decoder: MX633
SN: 237.001.015.043

▲

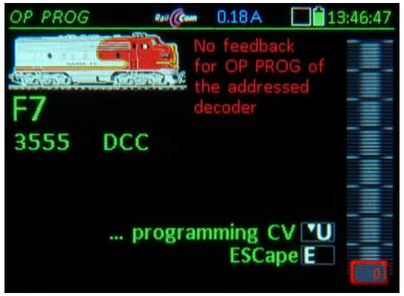
The first screen when entering ***OP PROG*** is a menu screen; ABOVE is the display shown of a decoder with working **RailCom feedback,** which makes identification possible: Information such as manufacturer, software version and decoder ID are read out and displayed automatically (in magenta, the color for RailCom);

BELOW is the display of a decoder **WITHOUT** working **RailCom feedback** and is therefore unidentifiable (i.e. the decoder is not equipped with RailCom, disrupted transmission etc.): the message “not identifiable” is displayed but the CV programming can still be started with the **U-Key** (although reading decoder CVs won’t work).

▼



E+ F ⟶



No feedback for OP PROG of the addressed decoder

NOTE: ***OP PROG*** is possible while driving or at standstill. The vehicle can be driven normally while programming or reading out data. Of course, data transmission tends to be worse while driving and it is therefore recommended to drive only when RailCom feedback is available (or the programming changes can be seen instantly by the vehicle’s behavior).

Use the displayed function keys from the menu to switch to the actual working area:

TP- Key ➞ the decoder is once again identified (manufacturer, SW version… same as during entry),

A- Key ➞ the **decoder input screen** is displayed where a new address can be written to the decoder (provided the decoder allows programming a decoder address on the main track, which the NMRA R&R does not provide for).

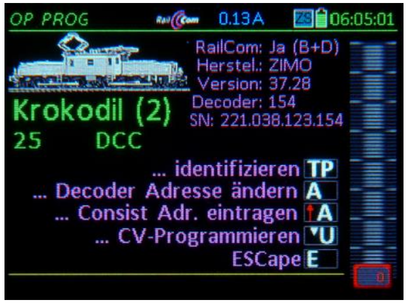
↑ **A- Key** (= Shift-A) ➞ Screen for entering a consist address (CVs #19, 20) including supplementary info.

U- Key ➞ opens the **CV-Programming** page, where CVs can be read-out and programmed; see below for details.

OP PROG – A-Key → Decoder Address change

NOTE: The address programming via "PoM" **is only possible for decoders that support it,** for ZIMO decoders from SW version 37.8 (non-sound) or 37.28 (sound decoder). Older versions and many third-party decoders can only be programmed in SERV PROG (i.e. on the programming track).

A- Key → Enters the procedure “Change decoder address”



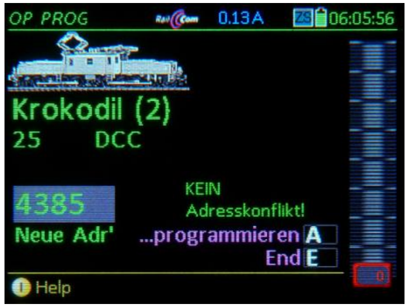
OP PROG 0.13A 06:05:01

RailCom: Ja (B+D)
Herstel.: ZIMO
Version: 37.28
Decoder: 154
SN: 221.038.123.154

Krokodil (2)
25 DCC

... identifizieren TP
... Decoder Adresse ändern A
... Consist Adr. eintragen ↑A
... CV-Programmieren ▼U
ESCape E

A →



OP PROG 0.13A 06:05:56

Krokodil (2)
25 DCC

4385
Neue Adr'

KEIN
Adresskonflikt!
...programmieren A
End E

Help

The next screen displays an entry field ▲
where the desired address can be entered; then:

A- Key (… programming) → the address is programmed to the decoder

ACK after programming a CV and confirmation via “RailCom“ (or other feedback)
SENT after programming a CV without a feedback system
NACK after a programming attempt without acknowledgement (even though a feedback system is present).

The active engine is automatically switched to the new address and can be driven immediately! (Exception after “NACK”: the old address remains active).

OP PROG – ↑-A-Key → Consist address entry

NOTE I: described here is the decoder-based consisting, which is not the same as the system-based consisting as explained in the chapter “*DRIVING AND CONSIST CONTROL”*!

NOTE II: The ZIMO controller procedure for the allocation of a consist address partly refers to settings which only exist in ZIMO decoders, for example the use of the CV #20 for consist addresses >127 (to 9999) and the consist automation (automatic switching between single engine and consist driving, when the individual address of a (consist) vehicle is actuated).

NOTE III: there are a few other consist settings available for ZIMO decoders, such as automatic BEMF reduction, automatic light suppression when in consist mode etc., which must be defined through CV programming for each decoder in the consist.

↑-A- Key → starts the procedure “Consist address entry”

The currently valid consist data (the consist address, direction and consist automation) is read out of the decoder and displayed in the input fields,where new data can be entered: the new consist address for the vehicle, the desired direction (same as the consist or reversed) and the consist automation (ON / OFF), see above for details. →

↑-A

A-Key → new data is sent to the decoder.

Pitcture follows later

OP PROG – U-Key → CV-Programming

After entering “CV programming” (with **U-Key**), the first input line appears for:

… Programming a CV by typing in a
CV-Number – **A- Key** – CV-value – **A- Key**, or

… Read-out of a CV (if RailCom or other feedback system is available) by typing in a
CV-Number – **A- Key** – (repeat) **A- Key**

A report about success (or failure) of a program or read-out process, at the end of each line after completion with the **A key,** appears automatically:

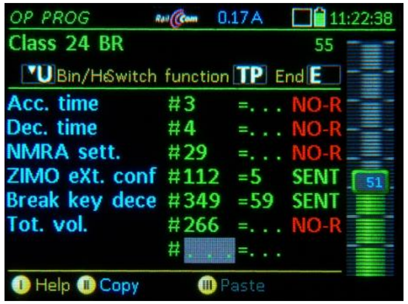
ACK after programming a CV and receiving confirmation via “RailCom“ (or other feedback)
READ after reading out a CV value and confirmation through “RailCom“ (or other feedback)
SENT after programming a CV without a feedback system
NACK programmed without acknowledgement (even though a feedback system is present)
NO-R after unsuccessful read-out (usually because of no feedback)

Scrolling wheel → is used to mark previously edited lines (values or CV numbers) and overwrite the values as needed.

C-Key → deletes the marked value (CV number or value)

CV programming **without** feedback: ▶

Values are sent (**SENT**), programming success cannot by checked, read-out is not possible (therefore always **NO-R**), only NMRA standardized CV descriptions will be shown because the decoder manufacturer is not known.



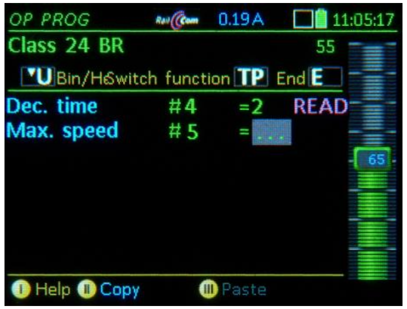
OP PROG 0.17A 11:22:38
Class 24 BR 55
▼U Bin/H&Switch function TP End E

Acc. time	#3	=. . .	NO-R
Dec. time	#4	=. . .	NO-R
NMRA sett.	#29	=. . .	NO-R
ZIMO eXt. conf	#112	=5	SENT
Break key dece	#349	=59	SENT
Tot. vol.	#266	=. . .	NO-R
	# . . .	=. . .	

Help Copy Paste

CV programming, read-out **with** feedback (**RailCom**):

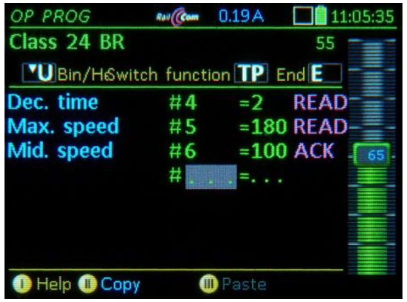
Programming is acknowledged (**ACK**), read-out is possible (**READ**) and all CVs of ZIMO decoders have descriptions. ▼ ◢



OP PROG 0.19A 11:05:17
Class 24 BR 55
▼U Bin/H&Switch function TP End E

Dec. time	#4	=2	READ
Max. speed	#5	= . . .	

Help Copy Paste



OP PROG 0.19A 11:05:35
Class 24 BR 55
▼U Bin/H&Switch function TP End E

Dec. time	#4	=2	READ
Max. speed	#5	=180	READ
Mid. speed	#6	=100	ACK
	# . . .	=. . .	

Help Copy Paste

E- Key → **Returns** to the menu and with a second E-Key to the ***LOCO*** or ***SWI*** mode.

TP- Key → **Testing** (with function key window) without leaving the programming screen.

U- Key → **CV-Bit-Programing** (via a special pop-up window for turning individual bits on or off).

The Softkeys: **II** = **Continue with or copy** the last edited CV-List, **III** = **Paste**
“Copy” and “Paste”: to or from the **clipboard** for CV-sets. This allows CV sets (these are the CVs in the current list) to be passed from one decoder to another.

OP PROG – Creation and use of CV - Sets

Not yet implemented!

…. via the clipboard:

Soft-Key II = Continue → reloads the CV list from the last editing session

Soft-Key II = Copy → copies the current CV lines to the clipboard.

Soft-Key III = Paste → pastes the CV lines from the clipboard to the currently displayed list.

Details and screen shots of CV sets: see chapter SERV PROG!

…. from and within the CV set memory:

↑-Key (Shift) → switches the Soft-Keys II and III from the above clipboard application to the CV-set application (II = copy, III = paste); visible by changing to a blue font:
II = copy CV-Set III = paste CV-Set

Soft-Key II = Copy CV-Set → Saving the CV rows of the current screen to the CV-Set memory:

A window opens to add data to the CV-Set.

Theme: Select one of the suggested themes (with toggle switch).

Name: Enter a name of your choice.

Info: Free choice of text.

↑-Key + A-Key → SAVE
(Attention: the CV-Set is not saved without this key sequence)

Soft-Key III = Paste… → search for the desired CV-Set in the CV-Set database and paste the CV-set rows to the current display screen.

The "Paste" command only lists the CV-lines in the display but are NOT yet sent to the decoder. This must be carried out thereafter for each individual line; that is, in practice press the

A-Key (after scrolling to the first row) → continue with each subsequent line for each CV number and value (other than pressing the A-Key, no further actions are necessary, except when a row is to be skipped), then the confirmation ACK appears in each row if the programming step was successful.

Details and screen shots of CV sets: see chapter SERV PROG!

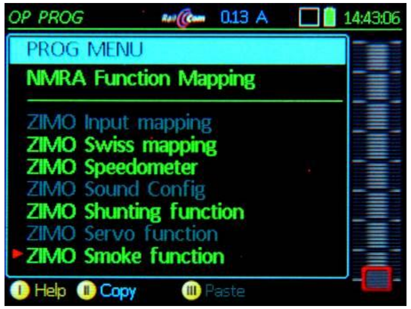
OP PROG – Special configuration procedures only for ZIMO decoder

Accessible via *OP PROG*:

M-Key → the first MENU lines ▶

Scrolling wheel → scroll down to the special procedures for ZIMO decoders (last menu section)

A- Key → starts the selected procedure.



The available and planned procedures:

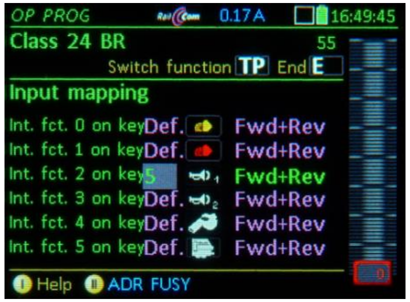
ZIMO LOCO Settings (not yet available)
ZIMO HLU Settings (not yet available)
ZIMO Input Mapping
ZIMO Swiss Mapping
ZIMO Speaker volume for function sounds
ZIMO Smoke functions (not yet available)

The **ZIMO Input Mapping** allows you to change the function key assignments ("external" functions to "internal" functions, as per sound project or default setting) . ▶

The “internal function" for example, is assigned to the respective **F-Key** in the sound project: this function is to be assigned to another function key. If this new function key is already activated used for another function, it must first be moved first.

Directional dependencies of functions can also be defined in this assignment window.

E-Key → returns to the menu screen.



OP PROG 0.17 A 16:49:45
Class 24 BR 55
Switch function TP End E
Input mapping
Int. fct. 0 on keyDef. Fwd+Rev
Int. fct. 1 on keyDef. Fwd+Rev
Int. fct. 2 on key5 Fwd+Rev
Int. fct. 3 on keyDef. Fwd+Rev
Int. fct. 4 on keyDef. Fwd+Rev
Int. fct. 5 on keyDef. Fwd+Rev
I Help II ADR FUSY

ZIMO Swiss Mapping

The ZIMO Swiss Mapping makes it easy to set up very complex lighting or function (dependent) switchings. For example, a free function key is assigned for (light) functions, without having to know the required CVs. The display columns are: ▶

(F-Tst): the selected function key should switch the function

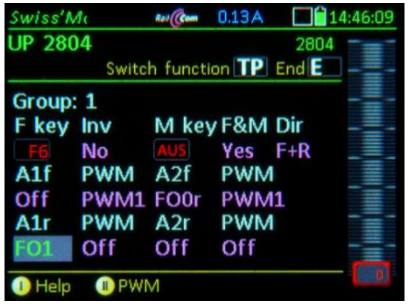
(Inv): yes/no, if yes: the function switching is inverted when the function key is activated.

(M-Tst): Defines a key as the “Master Key” (i.e. F0 Light).

(F&M): outputs only on if both F and M-Key are on

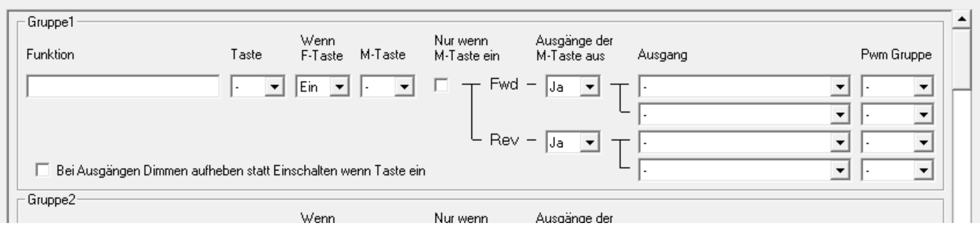
(A1v, A1r; A2v, A2r): outputs to be activated, direction dependent.

(PWM): pulse-width modulation groups can be defined.



Swiss'M 0.13A 14:46:09
UP 2804 2804
Switch function TP End E
Group: 1
F key Inv M key F&M Dir
F6 No AUS Yes F+R
A1f PWM A2f PWM
Off PWM1 FO0r PWM1
A1r PWM A2r PWM
FO1 Off Off Off
I Help II PWM

The logic is the same as in the “ZIMO Sound Programmer” (ZSP) available as a free download from the ZIMO Website http://www.zimo.at/web2010/products/zspdownload.htm). The picture below is a screen copy to compare with the MX32 display. Text in magenta is from the MX32 Swiss Mapping:



Gruppe1

Funktion	Taste	Wenn F-Taste	M-Taste	Nur wenn M-Taste ein		Ausgänge der M-Taste aus	Ausgang	Pwm Gruppe
	-	Ein	-	□	Fwd –	Ja	-	-
							-	-
					Rev –	Ja	-	-
							-	-

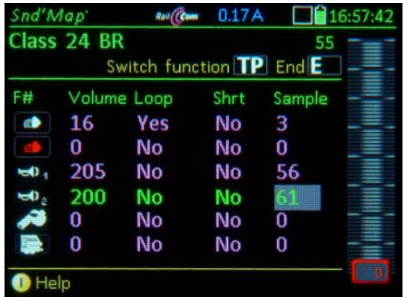
□ Bei Ausgängen Dimmen aufheben statt Einschalten wenn Taste ein

Gruppe2

Wenn Nur wenn Ausgänge der

The ZIMO Function Sound Volume screen, allows to quickly and easily assign function sounds to (free) function keys and adjust the volume at the same time. ▶

The sounds can also be set to endless playback or short playback duration (sound breaks off and plays the end part of the loop). To simplify the use of this setting, it is of advantage to know the sound sample number, which is published by the "Sound Providers".



Snd'Map' 0.17 A 16:57:42

Class 24 BR 55

Switch function TP End E

F#	Volume	Loop	Shrt	Sample
	16	Yes	No	3
	0	No	No	0
1	205	No	No	56
2	200	No	No	61
	0	No	No	0
	0	No	No	0

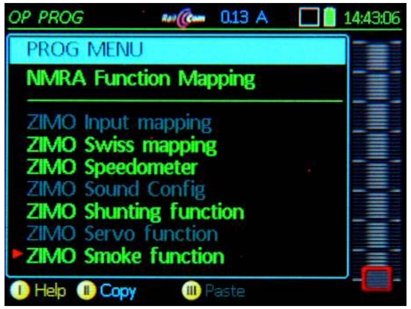
OP PROG – NMRA Function mapping

Accessible in ***OP PROG*** with:

M-Key ➞ the first menu lines appear. ▶

Scrolling wheel ➞ scroll to the desired line

A- Key ➞ starts the selected procedure.

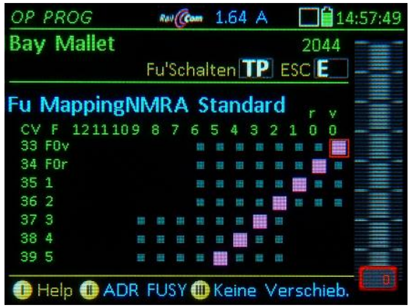


OP PROG 0.13 A 14:43:06

PROG MENU

NMRA Function Mapping

ZIMO Input mapping
ZIMO Swiss mapping
ZIMO Speedometer
ZIMO Sound Config
ZIMO Shunting function
ZIMO Servo function
▸ ZIMO Smoke function



OP PROG 1.64 A 14:57:49

Bay Mallet 2044

Fu'Schalten TP ESC E

Fu MappingNMRA Standard

														r	v
CV	F	12	11	10	9	8	7	6	5	4	3	2	1	0	0
33	F0v							■	■	■	■	■	■	■	▨
34	F0r							■	■	■	■	■	■	▨	■
35	1							■	■	■	■	■	▨	■	■
36	2							■	■	■	■	▨	■	■	■
37	3				■	■	■	■	■	■	▨	■			
38	4				■	■	■	■	■	▨	■	■			
39	5				■	■	■	■	▨	■	■	■			

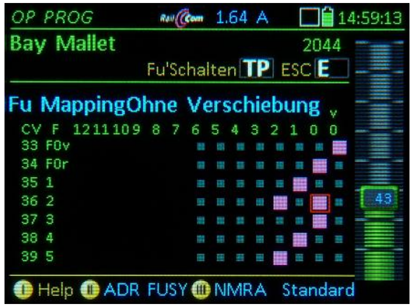
◀ **NMRA Function Mapping (standard)**

This is the basic function mapping of ZIMO decoders, with certain additional capabilities, compared to the NMRA defined procedures.

Scrolling wheel ➞ scroll in the column

Rocker switch ➞ scroll in the row

Number keys ➞ select the function keys



OP PROG 1.64 A 14:59:13

Bay Mallet 2044

Fu'Schalten TP ESC E

Fu MappingOhne Verschiebung

															v
CV	F	12	11	10	9	8	7	6	5	4	3	2	1	0	0
33	F0v							■	■	■	■	■	■	■	▨
34	F0r							■	■	■	■	■	■	▨	■
35	1							■	■	■	■	■	▨	■	■
36	2							■	■	■	■	▨	■	▨	■
37	3							■	■	■	■	■	■	▨	■
38	4							■	■	■	■	■	▨	■	■
39	5							■	■	■	■	▨	■	■	■

◀ **NMRA Function Mapping without left-shift**

This special ZIMO feature is accessible with CV #61 = 97 and allows "higher" F-keys to also control "lower" functions.

23. ZIMO Sound Config

Configuring sound in the operating mode LOCO

Special user interface for ZIMO sound decoder configuration using pseudo-programming of CVs #300 and #301, therefore, also known under the name **"CV #300 - Procedures"** (see decoder manual).

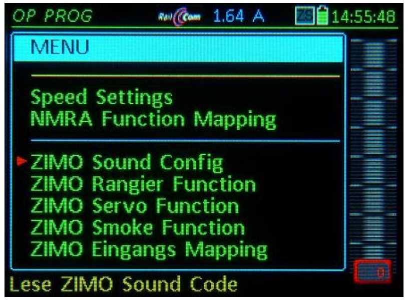
Within the actual sound selection (in the "CV #300 - Procedure"), the function keys DO NOT operate any function outputs, but rather perform special tasks within the sound selection. These are also displayed on the screen.

The ***ZIMO Sound Config*** is accessible from the ***OP PROG*** screen:

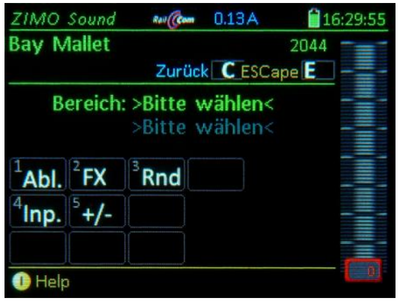
E-Key (to E-menu) + **F-Key** ➝ Enters the programming mode, then…

M-Key ➝ Menu: among other available options is also the ***ZIMO Sound Config***

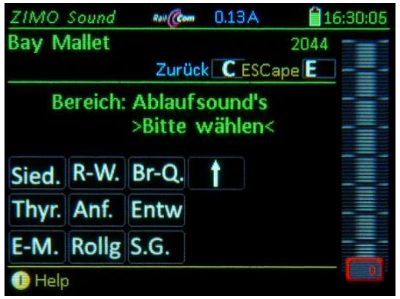
M, Scroll →



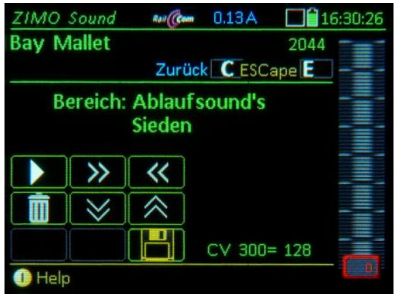
A →



F1



F1



Function keys 1 to 5 ➝ choosing the selection area:

F 1: Driving-Sound (Abl.), contains the following sounds: Boiling, Directions change (R-W), Brake squeal (Br-Q), Thyristor sound (Thyr.), Start-up sound (Anf.), Blow-off (Entw), E-Motor sound (E-M.), Rolling sound (Rollg), Switch gear sound (SG), Turbo sound (Turbo), in sound groups.

F 2: Function sound (FX), the F-Keys are shown so that a (new) sound can be assigned to each key.

F 3: Randomly generated sound (Rnd): Z1 to Z8

F 4: Switch input sound (Inp.): In1 to In4

F 5: Switching between steam sets (+/-)

> NOTE: In future versions, the entries will be matched automatically to the sound project through decoder feedback!

For example, by selecting the driving sound or the corresponding F-key, the CV #300 procedure is triggered automatically with the pseudo-programming of CV #300. This will be displayed at the bottom of the screen with the current value in CV #300.

After selecting the sound area and sound group, the sound file selection screen is reached:

F0 (= Number key 1) = playback: Plays back the currently selected sound file.

F1, F2 = prev, next: Plays back the previous or next sound sample stored in the sound decoder.

F4, F5 = prev, next: Switch to previous or next sound group (groups of whistles, bells, coal shoveling etc.), starts playing the first sample of the group.

F6 = loop: If F6 is "on" when exiting the allocation procedures, the sound sample is stored and played back as long as the relevant function key is pressed by repeating the sound between the loop markers (the loop marks are part of the sound file).

Playable whistle!

F7 = short: If F7 is "on" when exiting the allocation procedures, the sound sample is shortened and played back only as long as the function key is pressed, by omitting the center portion.

> NOTE: F6 and F7 are only effective provided the loop markers are included in the sample; basic settings are also saved; changes take effect only if F6/F7 are actuated.
> NOTE: If F6 and F7 are not actuated, the sound sample will always be played back in the same length it was saved, regardless of how long the function key is pressed.

F3 = CLEAR + end: The allocation procedure is stopped and the current sound removed. There will be no sound allocated to this function key.

F8 = STORE + end: The allocation procedure is stopped and the last selected function sound is stored and ready for playback when this function key is pressed.

The speed regulator acts as volume control for the selected sound during allocation procedure. A speaker icon is shown on screen.

■ ZIMO decoders are delivered with pre-recorded so-called “sound collections”, from which typical engine sounds are already activated and function sounds allocated to function keys, for immediate operation.
By default, the “European steam/diesel collection” plays back the sound of a 2-cylinder engine (the chuff rate can only be approximate without further tuning) with automated blow-off and brake squeal as well as some randomly played stationary sounds.

The functions are assigned to certain "function sounds", that is, a specific "sound class" to each of these functions, and from that, a specific "sound sample" is assigned, which is played back by the relevant function key. The function keys for the “European Steam Collection” are allocated to the following function sounds**:**
F2 – short whistle F9 – compressor
F4 – water drain (blow off…) F10 – generator
F5 – long whistle (playable) F11 – injector
F6 – bell
F7 – coal shoveling or oil burner

■ During the sound selection within a certain group, all available sound samples of this group can be played back (key 1), jumped to the next sample (key 2) or jumped back to the previous sample (key 3).
In the case of function sounds or random sounds, you can also jump between the groups (key 5, prev) or (key 6, next), since each function key can be assigned to any type of sound.

■ If a suitable sound sample is found, it can be activated with the number key 8 (STORE + end), that is, assigned to the relevant function key. At the same time, the SOUND SELECTION is automatically closed.

Before closing, further settings can be made in some cases with the help of function key F6 or F7, for example, the sound loop behavior (playable sound) or whether a random sound is played back at stand-still or cruising.

■ If no sound is to be assigned for this function, or the previous assignment should be deleted without replacement, the function-key F3 (CLEAR + end) is pressed. At the same time, the SOUND SELECTION is also automatically closed.

■ To exit the SOUND SELECTION without making changes (i.e. the current setting to be retained); press the **E-Key**.

**Also check the ZIMO Sound Decoder manual,
chapter ZIMO SOUND – Selection and Programming!**

The CV #300 procedures described there for manually initiating the sound selection process are replaced with the automated procedures of the MX32 described here. There is no need to start a manual CV #300 procedure as described in the decoder manual.

.

ZIMO SOUND configuration in real time and ZIMO “Sound Collections”

A distinctive feature of ZIMO sound projects is the ability to adapt the sound through the controller to the user's requirements during operation.

The user is free to change acoustics of a locomotive to his/her own taste by combining for example a chuff sound from 5 different chuff samples and one or several whistles; equally select bells, compressors, coal shovels, oil burners or break squeals etc.

The "CV #300 - Procedures" can be used with any digital system. It is however much more convenient with a ZIMO MX31 or MX32.

Some ZIMO sound projects are organized as "Sound Collections” containing “sound groups”, with each group (e.g. chuff sets, whistles, air pump sounds ...) having different variants (recordings from different prototype locomotives) stored in the decoder, which can be put together individually.

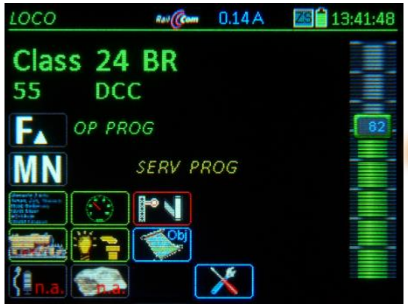
The following sound groups (selectable in the field "Type") within the sound configuration are available:

- ➢ Driving sound groups (only in sound-collections, not in “normal“ single-engine projects) - Groups: Chuff sets, boiling, brake squeal, thyristor sounds …
- ➢ Function sound selection - the predefined allocation of whistles, horns, pumps etc. can be changed for each function key F1 – F20, both within a sound group (i.e. whistles, if several types are available which is typical for sound collections) and between groups (i.e. moving a whistle to another function key).
- ➢ Random sound selection - for each random sound generator Z1... Z8
- ➢ Switch input sound selection - for each switch input S1, S2.

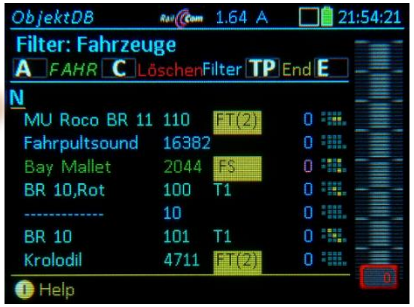
It is also possible to adjust the volume of the selected sound file within the sound selection procedure (not to be confused with the total volume).

24. ObjectDB… = *Object- Database*

E-Key + 6 ➞ Enters the ***ObjectDB*** from the operating mode ***LOCO*** or ***SWI***



E + 6
=
ObjDB


ObjektDB RailCom 1.64 A 21:54:21

Filter: Fahrzeuge

A FAHR C LöschenFilter TP End E

N

MU Roco BR 11	110	FT(2)	0
Fahrpultsound	16382		0
Bay Mallet	2044	FS	0
BR 10,Rot	100	T1	0
-------------	10		0
BR 10	101	T1	0
Krolodil	4711	FT(2)	0

Help

The ***ObjectDB*** is a list of objects (addresses displayed with different data and in various states) that are stored in the controller or the command station. All addresses (vehicles) that were active once remain in the object database, even after deleting them from the ***LoR*** (loco recall memory).

The *ObjectDB* is displayed on screen very similar to that of the *LoR*. However, two additional object types are included: objects (blue lines) that are no longer in the ***LoR*** (were deleted there with the **C-key**) but are still in the controller, and objects (gray lines) which are no longer in the ***ObjectDB*** of the controller itself, but still in the ***ObjectDB*** of the command station MX10. Overall, the **text colors for these lines in the MX32 ObjectDB have** the following meaning:

blue text: Address is in the MX32 ***ObjectDb***, but not in the ***LoR***,

green text: Address is also in the ***LoR*** (Loco Recall memory),

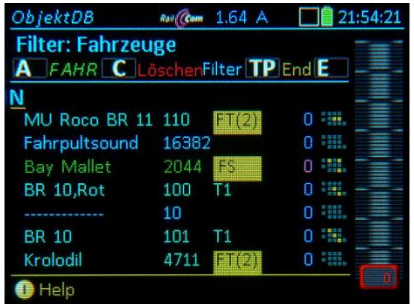
turquoise text: Address belongs to a consist in this MX32, and is therefore also in the ***LoR***.

gray text: Address is in the ***ObjectDB*** of the MX10 command station but NOT in (this) MX32.

Representation of speed: magenta: kmh from RailCom feedback, if available
(alternatively) blue: Speed step in the internal 1024 step scale (NOT in km/h)

The ***ObjectDb*** is several levels deep, and can be scrolled through with the **rocker switch**

The individual lines in the first level of the ***LoR*** contain:


ObjektDB RailCom 1.64 A 21:54:21

Filter: Fahrzeuge

A FAHR C LöschenFilter TP End E

N

MU Roco BR 11	110	FT(2)	0
Fahrpultsound	16382		0
Bay Mallet	2044	FS	0
BR 10,Rot	100	T1	0
-------------	10		0
BR 10	101	T1	0
Krolodil	4711	FT(2)	0

Help

* First column: Vehicle name (if one was given, otherwise just -------)

* Second column: Vehicle address (no further identifier if it is a DCC address)

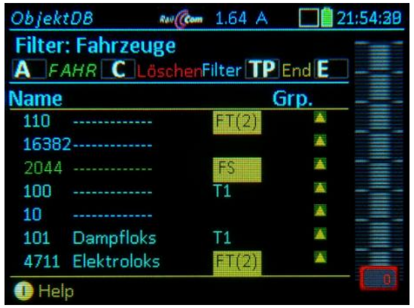
* Third column: External or consist control:
“FS“: The vehicle is controlled by another controller
“FS(..)“: The consist is controlled by another controller
„T1, T2, .. “T9“: Address is part of a consist
“FT(..)“: (inactive) consist resides in another controller

* Fourth column: Direction (highlighted red, when at stand-still)

* Fifth column: Speed (see above)

* Sixth column: small function table F0…F9 (to see which functions are turned on at a glance).

Rocker switch ➞ to second ***LoR*** level.


ObjektDB RailCom 1.64 A 21:54:38

Filter: Fahrzeuge

A FAHR C LöschenFilter TP End E

Name			Grp.
110	-------------	FT(2)	▲
16382	-------------		▲
2044	-------------	FS	▲
100	-------------	T1	▲
10	-------------		▲
101	Dampfloks	T1	▲
4711	Elektroloks	FT(2)	▲

Help

The individual lines in the second level of the ***LoR*** contain:

* First – fourth column: same as level one

* Fifth column: Group name (if one exists)

NOTE: Only the MX10 command station offers a central database (gray lines).

Working with the ***ObjectDB***:

Rocker switch ➞ Select the contents in the right columns (Consists, ZACK*), Group, Qos **), GUI, Section, Speed ...)

Softkey II ➞ Object menu

Softkey III ➞ add vehicle to or delete vehicle from the ***LoR*** (Loco Recall memory).

C-Key ➞ **Delete** vehicle from the ***ObjectDB*** (active vehicle cannot be deleted)

TP-Key ➞ ***ObjectDB*** filter (for vehicles, switch panels, dispatcher panels, accessories, controllers)

A-Key ➞ **activates** the selected address and opens the ***LOCO*** display; also copies the gray lines of the command station to its own recall memory.

*) "ZACK" is derived from "**Z**IMO **ACK**nowledgement" and includes supplementary procedures of the ZIMO train protection system (HLU). A distinction is made in the ***ObjectDB*** between ZACK1 and ZACK2. The number indicates on which track the object is located. This function is supported starting with the decoder software version 34. To be able to use "ZACK" it must be turned on in the MX10 menu.

**) "Qos" stands for "Quality of Service" and like "ZACK" is supported by decoders with software version 34 and higher. The "Quality of Service" message from the decoder (transmitted via RailCom) is an indicator of the percentage of the DCC packets that do not arrive at all or arrive with errors. The number 5 would mean that 5% of the DCC packets are faulty. Each individual decoder (with RailCom feedback) is shown independent of each other.

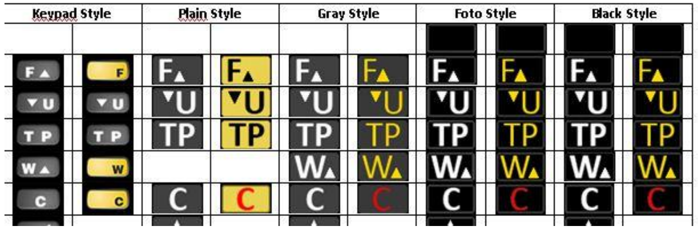
25. Styles

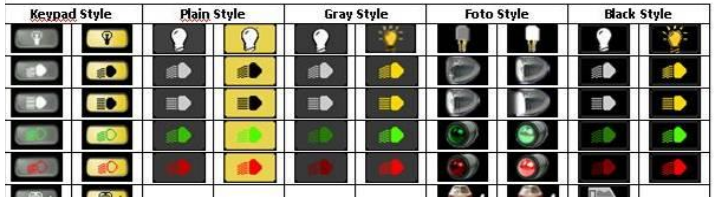
Below are a few examples of icons in different “styles”: They are shown side by side in the ON or OFF state.

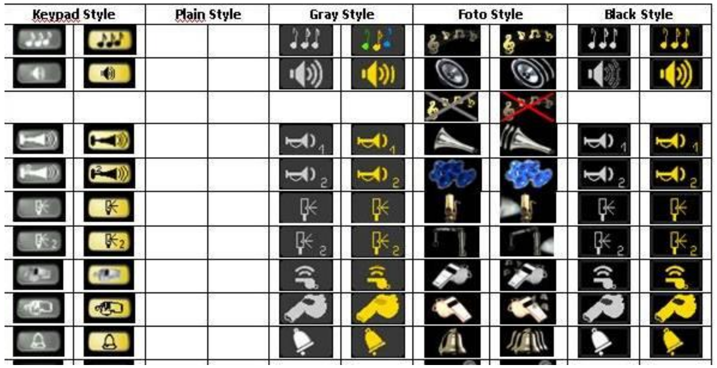
The location “System and function symbols” holds the icons that are used for the MX32 display. Two sets of “Styles” can be uploaded to the MX32 from the flash drive menu (one of these two can be selected during operation from ***CONFIG***).

- Keypad Style / Gray Style / Plain Style / Photo Style / Black Style

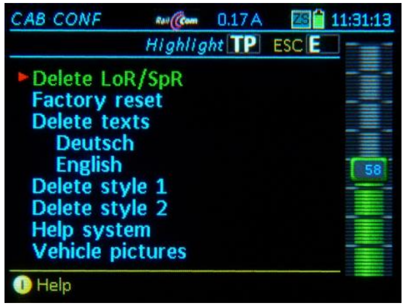
The “Black style” is normally chosen by default and is therefore also used predominantly in this manual.


Keypad Style
Plain Style
Gray Style
Foto Style
Black Style


Keypad Style
Plain Style
Gray Style
Foto Style
Black Style


Keypad Style
Plain Style
Gray Style
Foto Style
Black Style

Selecting from the two uploaded styles in (see chapter) ***CONFIG*** ▶


CAB CONF 0.17 A 11:31:13
Highlight TP ESC E
▸ Delete LoR/SpR
Factory reset
Delete texts
Deutsch
English
Delete style 1
Delete style 2
Help system
Vehicle pictures
Help

Examples of a typical ***LOCO*** display with various icon styles ▼

Black Style

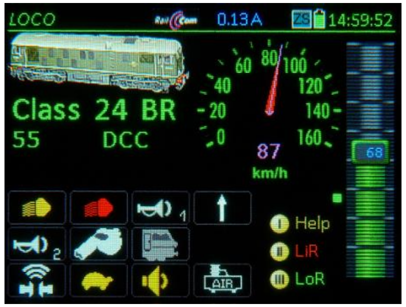
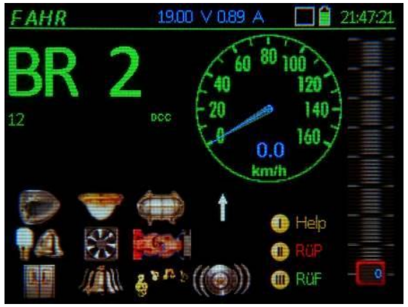


Photo Style



Keypad Style

Will be added later

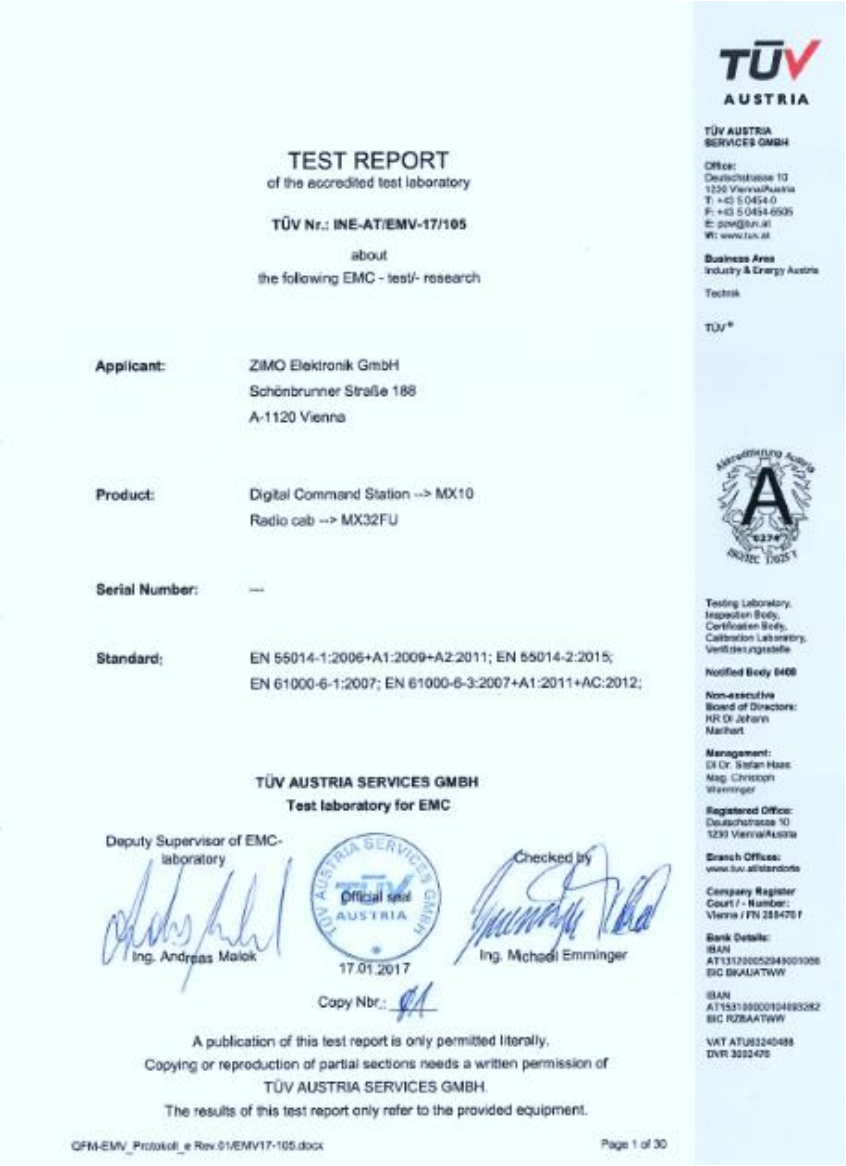
Grey Style

Will be added later

The last two styles are currently not implemented!

APPENDIX

To the MX10 command station and MX32 controller.



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TEST REPORT
of the accredited test laboratory

TÜV Nr.: INE-AT/EMV-17/105

about
the following EMC - test/- research

Applicant: ZIMO Elektronik GmbH
Schönbrunner Straße 188
A-1120 Vienna

Product: Digital Command Station --> MX10
Radio cab --> MX32FU

Serial Number: ---

Standard: EN 55014-1:2006+A1:2009+A2:2011; EN 55014-2:2015;
EN 61000-6-1:2007; EN 61000-6-3:2007+A1:2011+AC:2012;

TÜV AUSTRIA SERVICES GMBH
Test laboratory for EMC

Deputy Supervisor of EMC-laboratory
Ing. Andreas Malok

TÜV AUSTRIA SERVICES GMBH
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Official seal

17.01.2017

Checked by
Ing. Michael Emminger

Copy Nbr.: ØA

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QFM-EMV_Protokoll_e Rev.01/EMV17-105.docx Page 1 of 30

Declaration of Conformity:

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

24 months warranty:

Our products are technically sophisticated and are manufactured and tested with utmost care, therefore, ZIMO Elektronik GmbH guarantees their products for 24 months from the date of purchase (with proof of purchase from a ZIMO contractor).
The warranty covers the repair or replacement of defective parts. ZIMO Elektronik GmbH reserves the right to proceed at its own discretion only if the damage is proven to be the result of a design, manufacturing, material or transport fault. A repair does not extend the warranty. Warranty claims can be made with a ZIMO contract partner or ZIMO Elektronik GmbH. Proof of purchase is required.
The warranty does not apply:
- with normal wear and tear
- if devices are not used for the purpose intended by ZIMO Elektronik GmbH and in accordance with its operating instructions
- in case of modifications or alterations not performed by ZIMO Elektronik GmbH.

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