Digital plus by Lenz

Digital plus by Lenz
Esc
A
B
C
LH 01

Information LH01

Art. no. 21010
3rd version 0915

Table of contents

1 Welcome! 4

2 Important advice, please read first! 5

3 Overview of the features of the LH01 6

4 Operating elements of the LH01 9

5 Connection and initial operation 10

6 Emergency shutdown 12

7 Controlling locomotives 13

- 7.1 Changing the speed step 13
- 7.2 Changing the direction of travel / Emergency stop 14

8 Selecting locomotives 15

- 8.1 Selecting a locomotive address from the stack 15
- 8.2 Entering a new locomotive address into the stack 16
- 8.3 Deleting a locomotive address from the stack 18

9 Locomotive functions 19

- 9.1 Switching locomotive functions with function keys 19
- 9.2 Switching locomotive functions with the rotary knob 20
- 9.3 Assigning locomotive functions to function keys 21
- 9.4 Setting a locomotive function to permanent or temporary operation 22
- 9.5 Assigning function acronyms to locomotive functions 24
- 9.6 Deleting a function acronym 26
- 9.7 Changing a function acronym 27
- 9.8 Deleting all function acronyms 28

10 Double traction (Double Header) 29

- 10.1 Requirements to assemble a double traction 29
- 10.2 Assembling two locomotives in a double traction 29
- 10.3 Deleting a double traction 31
- 10.4 Error messages during double tractions 32

11 Switching points and signals 33

12 Setting (programming) locomotive decoders (PoM) 34

- 12.1 Reading CVs via PoM and the address display LRC120 36

13 System settings 38

13.1 Setting and reading a locomotive address on the programming track 40
13.2 Setting and reading the XpressNet address 44
13.3 Setting the language 46
13.4 Resetting the LH01 47
13.5 Resetting command stations (LZV100/LZ100) 48
13.6 Displaying the version number of the LH01 49
13.7 Displaying the version number of the command station 50
13.8 Setting the club mode 51
13.9 Displaying the hardware ID 54
13.10 Setting the brightness of the display 55
13.11 Enabling/Disabling the displaying of function acronyms 56
14 Technical appendix 57
14.1 Help in case of malfunction 57
14.2 List of error messages 58
14.3 Display text / Languages 59

1 Welcome!

We would like to congratulate you on your acquisition of the LH01 by ***Digital plus by Lenz*®**. We hope you will enjoy this model railway control.

The purpose of this operating manual is to explain the use of the LH01. If you still have questions after reading this manual, please contact us. We will be happy to help you. There are four different ways of contacting Lenz Elektronik GmbH:

Mail address: Lenz Elektronik GmbH
Vogelsang 14
D-35398 Giessen

Phone: +49 (0) 6403 900 133 A recorded message will inform you of our availability.

Fax: +49 (0) 6403 900 155

E-mail: info@digital-plus.de

If you encounter any problems with the LH01, please contact us, providing a problem description as well as the following information:

- Version number of the command station
- Version number of the LH01
- Designation, version number and service number of all connected XpressNet devices (additional manual controls, Interface etc.).

This will help our service department solve the problem. Thank you.

1.1.1 All present?

Please check if all components have been delivered:

- LH01 device
- Connecting cable
- Operating manual (this booklet)

If any component is missing, please ask your specialist supplier for a subsequent delivery.

2 Important advice, please read first!

The manual control LH01 is a component of the ***Digital plus by Lenz®*** system and was submitted to intensive testing before delivery. Lenz Elektronik GmbH guarantees fault-free operation if you follow the advice below:

The LH01 may only be operated with ***Digital plus by Lenz®*** system components. Any use other than that described in this operating manual is not permitted and all guarantees will be invalid if the LH01 is used inappropriately. Connect your LH01 only to devices that are designated for such connection. This operating manual will tell you which devices are suitable. Do not expose the LH01 to damp or direct sunlight.

WARNING!

Do not leave your model railway system unsupervised during operation! The heat generated by a short-circuit creates a fire risk!

3 Overview of the features of the LH01

Locomotive addresses	Locomotive addresses range from 1 - 9999. Address 0 is used to control an analogue locomotive.
Stack for locomotive addresses	The LH01 has a stack for locomotive addresses that comprises 12 slots. The stack serves to store the locomotive addresses as well as the settings used most frequently.
Locomotive functions and configuration	Up to 29 functions are available for each locomotive address. Use of the LH01 with a command station LZV100 facilitates the independent setting of these 29 functions to permanent or temporary operation. This setting is stored with the locomotive address in the LZV100. *Permanent operation:* Press the key once to enable this function and again to disable this function. *Temporary operation:* This function is enabled as long as the corresponding key is pressed, and disabled as soon as the key is released.
Function acronyms	You can assign an acronym to each of the 29 functions from among the list of acronyms contained in the LH01. This facilitates finding a desired function. You can enable and disable the display of acronyms.
Speed steps	The LH01 supports 28 or 128 speed steps depending on the mode set in the command station for the respective locomotive address. The mode cannot be changed.
Club mode	The LH01 has two so-called ‘club modes’ in which certain functions of the LH01 are disabled. This allows operation by model railway fans who are not fully familiar with the LH01.
Double traction	Two locomotives can be joined in a double traction and controlled simultaneously.

Multiple traction	Multiple tractions that are already joined (by means of the LH100 or LH90) can be controlled. It is not possible to join a multiple traction with the LH01.
Programming in operational mode (PoM)	PoM allows you to change the settings of the locomotive that is currently being controlled. You can change, for example, the starting delay, maximum speed, or sound volume.
Changing a locomotive address	You can read or change a locomotive address on the programming track of the LZV100.
Points, signals and other accessories	The address range for points, signals and other accessories (for example, uncouplers) ranges from 1 to 999.
XpressNet	Communication with the command station is made through the XpressNet connection. As is the case with all other XpressNet devices, your LH01 can be disconnected and reconnected during operation. The locomotive controlled last will continue its operation with the last settings stored. Once reconnected, this locomotive will again be controlled.
Housing	Plastic
Dimensions	W 70 mm x H 125 mm x D 38 mm

Illustrations in the step-by-step instructions:

Key	Display	Explanation

In this booklet all entries in the LH01 are shown on the left. All corresponding illustrations of the display ***after*** entry are shown on the right.

All operating steps described in this booklet presume that the LH01 is connected to the *Digital plus by Lenz* ® system and that the system is turned on.

Illustration of displays and operating elements:

‘0001’ 'Esc'

The displays and operating elements of the LH01 are depicted as illustrations. References to the display are indicated by single quotes (‘’).

Cross references:

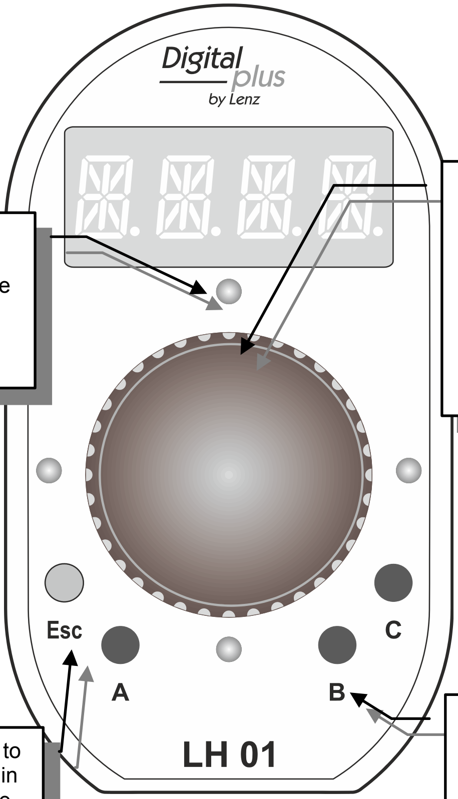
(⇨p. 23)

This arrow refers to specific pages of the operating manual that contain further information on a given subject.

Important information:

Text boxes contain important information or advice.

4 Operating elements of the LH01



The LEDs surrounding the rotary knob indicate when you are in one of the menus.

The rotary knob is used to make entries. Apart from the rotary function, the knob has five key functions: up, down, left, right, and centre.

Use the 'Esc' key to go back one step in the menu structure.

Function keys A, B, and C:

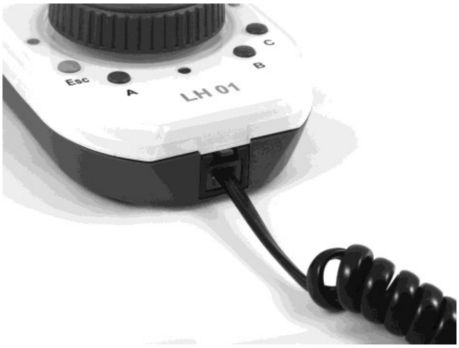
For each locomotive address in the stack, locomotive functions (F0 to F28) can be assigned to these keys.

5 Connection and initial operation

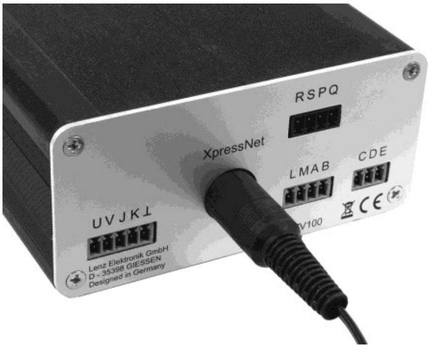
The LH01 can be used with the command stations LZ100 or LZV100.

> The LH01 requires the software version 3.6 for the command station LZ100/LZV100.
> Update your command station, if necessary.

1. Insert the Western plug of the enclosed connecting cable into the socket of the LH01.


Esc
A
B
C
LH 01

2. Insert the five-pole DIN plug into the five-pole DIN socket at the back of the LZ100/LZV100.

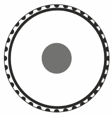
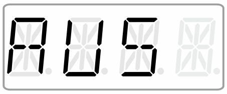
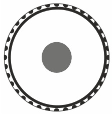
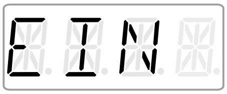

RSPQ
XpressNet
LMAB
CDE
UVJK⊥
Lenz Elektronik GmbH
D - 35398 GIESSEN
Designed in Germany
V100

or (if you have already installed an XpressNet connection on your layout) in an LA152 adapter.

After starting the LH01 the display will show the locomotive address used last. The factory setting of this address is ‘0003’.

!	As is the case with all XpressNet devices, the LH01 can be disconnected and reconnected during operation. After disconnecting the LH01, the locomotive controlled last will continue its operation with the last settings stored. Once reconnected, the locomotive address controlled last will be displayed, and you will be able to continue controlling this locomotive elsewhere.

6 Emergency shutdown

Action	Display	Explanation
		Press the centre of the rotary knob and **keep it pressed** until ‘AUS’ is displayed. The track voltage is switched off.
		Press the centre of the rotary knob again until ‘EIN’ is displayed. The track voltage is switched on again.

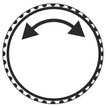
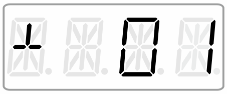
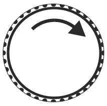
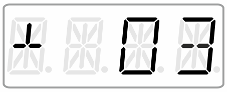
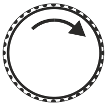
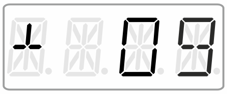
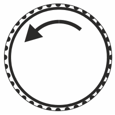
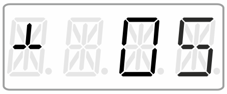
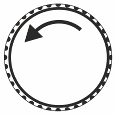
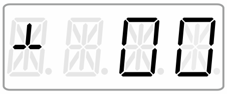
During the ‘AUS’ mode, press 'Esc‘ to display the current locomotive address.

7 Controlling locomotives

7.1 Changing the speed step

During the first operation, the LH01 uses locomotive address 3 which is shown in the display.

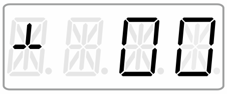
Turn the rotary knob to change the speed step for this locomotive address:

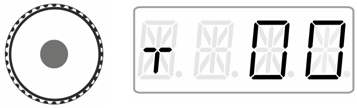
Action	Display	Explanation
		Turn the rotary knob one ‘click’ to the right or left to display the current speed step of the locomotive.
		A turn clockwise will increase the speed step.
		
		A turn counter clockwise will decrease the speed step …
		… down to a standstill.

7.2 Changing the direction of travel / Emergency stop

Press the centre of the rotary knob …

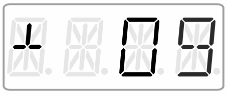
at speed step 0

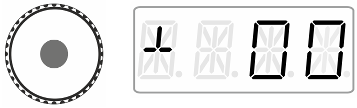




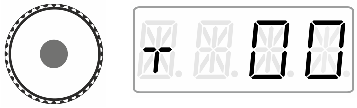
… to change the direction of travel.

at speed step >0





… to trigger a locomotive dependent emergency stop (the active locomotive will stop without the set breaking delay).

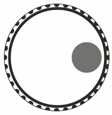
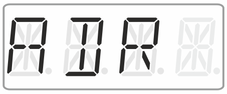
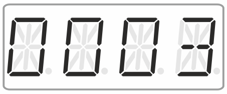
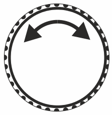
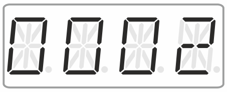
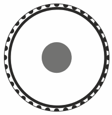
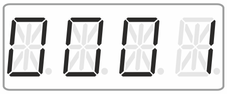


Press the centre of the rotary knob again to change the direction of travel.

8 Selecting locomotives

8.1 Selecting a locomotive address from the stack

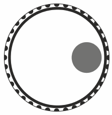
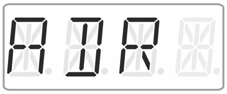
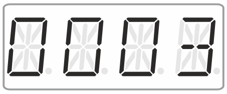
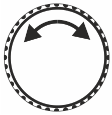
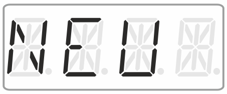
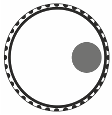
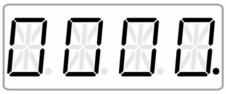
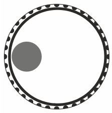
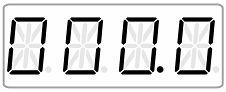
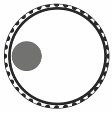
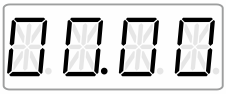
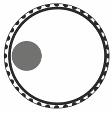
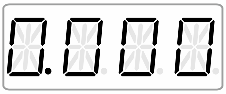
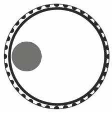
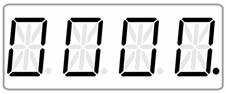
Ex-factory, three of the twelve stack slots are occupied by locomotive addresses 1 to 3.

Action	Display	Explanation
		Press the right side of the rotary knob until the LED to the right shines.
		Release the rotary knob to display the locomotive address used last. The factory setting is address 3.
		The locomotive addresses stored in the stack will be displayed one after the other. Turn the rotary knob until you reach the desired locomotive address…
		… press the centre of the rotary knob to select the address. You are back in the mode ‘Locomotive control’.

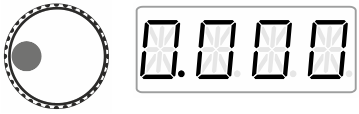
8.1.1 The desired locomotive address is not in the stack?

Re-enter the locomotive into the stack (⇨p. 16). If the stack is full, you will have to delete another locomotive address from the stack (⇨p. 18).

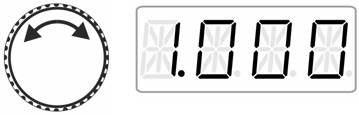
8.2 Entering a new locomotive address into the stack

Action	Display	Explanation
		Press the right side of the rotary knob until the LED to the right shines.
		Release the knob to display the locomotive address used last. The factory setting is address 3.
		Turn the knob until ‘NEU’ is displayed. **‘NEU’ is not displayed?** This means that all twelve slots of the stack are occupied by locomotive addresses. If the stack is full, you will have to delete another locomotive address from the stack (⇨p. 18).
		Click right. The digit that can be changed with the rotary knob is marked with a dot. Click left to change the ‘single’ digit that you would like to change.
		The ‘ten’ digit was selected.
		The ‘hundred’ digit was selected.
		The ‘thousand’ digit was selected.
		The ‘single’ digit was selected again.

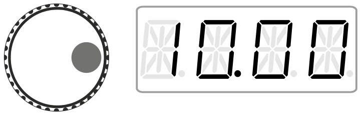
In the following example, locomotive address ‘1234’ is entered:



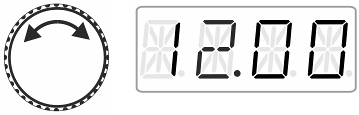
Click left until the ‘thousand’ digit is marked with a dot.



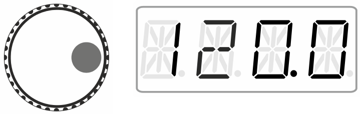
Turn the rotary knob until the ‘thousand’ digit displays ‘1’.



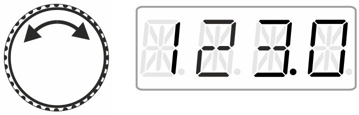
Click right to select the ‘hundred’ digit.



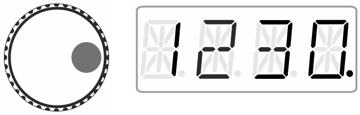
Turn the rotary knob until the ‘hundred’ digit displays ‘2’.



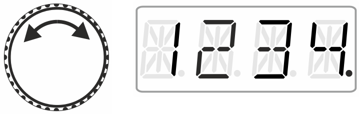
Click right to select the ‘ten’ digit.



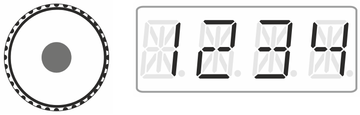
Turn the rotary knob until the ‘ten’ digit displays ‘3’.



Click right to select the ‘single’ digit.



Turn the rotary knob until the ‘single’ digit displays ‘4’.



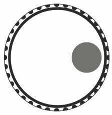
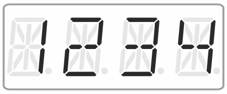
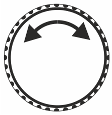
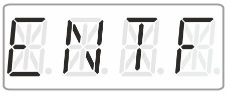
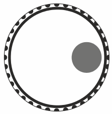
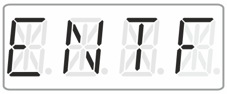
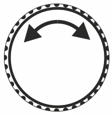
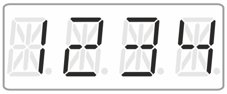
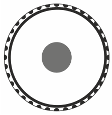
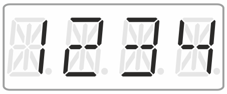
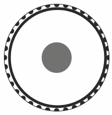
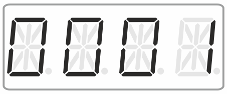
Press the centre of the rotary knob to confirm your selection.

You are back in the menu ‘Locomotive control’. You can control the locomotive with the address ‘1234’ immediately.

8.2.1.1 ‘NEU’ is not displayed?

This means that all twelve slots of the stack are occupied by locomotive addresses. If the stack is full, you will have to delete another locomotive address from the stack.

8.3 Deleting a locomotive address from the stack

Action	Display	Explanation
		Press the right side of the rotary knob until the LED to the right shines. Press to display ‘ADR’.
		Turn until ‘ENTF’ is displayed.
		Click right…
		… and turn the rotary knob until the address that you would like to delete is displayed.
		Press the centre of the rotary knob to confirm your selection. The locomotive address to be deleted flashes. Press 'Esc' to cancel the deletion process.
		Press the centre of the rotary knob again to confirm the deletion. The next locomotive address from the stack is displayed. You can control the locomotive immediately.

If you delete a locomotive address from the stack, you will also delete the assignments of the function keys for this address.
If you re-enter the locomotive address into the stack, you will have to re-assign the function keys (⇨p. 24).

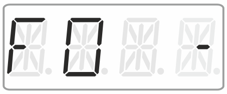
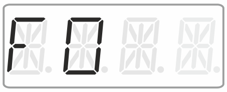
9 Locomotive functions

9.1 Switching locomotive functions with function keys

Ex-factory, the function keys are assigned as follows:

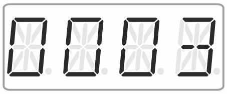
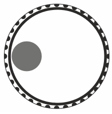
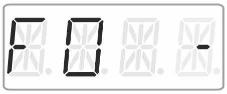
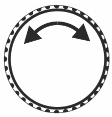
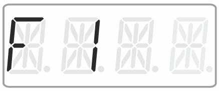
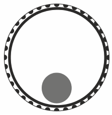
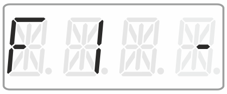
A	switches digital function F0
B	switches digital function F1
C	switches digital function F2

You can freely assign the digital functions F0 to F28 to these function keys. See section Assigning locomotive functions to function keys (⇨p. 21) for information on how to proceed.

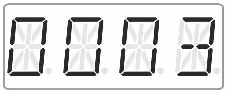
Action	Display	Explanation
A		Changes the function status assigned to key 'A' for the active locomotive address (factory setting: F0). Here: The function is being enabled, as indicated by the dash on the right.
A		The function is being disabled.

Function keys B and C behave accordingly.

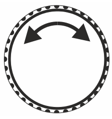
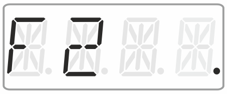
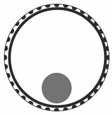
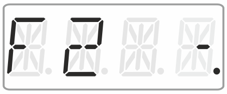
9.2 Switching locomotive functions with the rotary knob

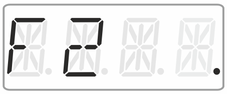
Action	Display	Explanation
		Select the locomotive address for which you would like to change a function.
		Press the left side of the rotary knob until the LED to the left shines. The locomotive function selected last is displayed (here: F0). A dash on the right indicates that the function is enabled.
		Turn the rotary knob to display the function that you would like to switch (here: F1).
		Click the bottom of the rotary knob to change the function status. Here: F1 is enabled.

Now, press …

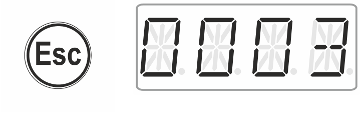
Esc		… to leave the menu and return to 'Locomotive control'

or …

		… to select another function and change its status. The dot at the bottom right indicates that the function has been set to **temporary operation**.
		Enables the function as long as the rotary knob is pressed. Release…



… the rotary knob to disable the function again.



Press 'Esc' to leave the menu and return to ‘Locomotive control’.

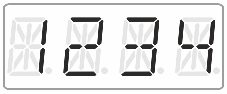
9.3 Assigning locomotive functions to function keys

Ex-factory, or after re-entering a locomotive address into the stack, function keys A, B, and C are assigned to functions F0, F1 and F2.

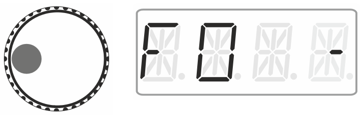
You can also assign other functions to the keys. Functions F0 to F28 are available.

> The assignments of function keys are stored **separately** in the stack for each locomotive address.
> You can select different assignments for locomotive addresses ‘1234’ and ‘0003’.

Action Display Explanation

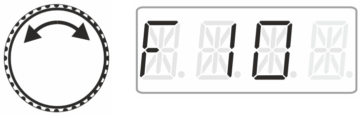


Select the desired locomotive address.

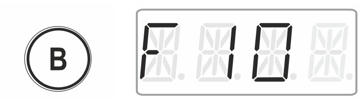


Press the left side of the rotary knob until the LED to the left shines.

The locomotive function selected last is displayed (here: F0). A dash on the right indicates that the function is enabled.



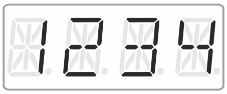
Turn the rotary knob to display the function that you would like to assign to function key A, B or C.



(flashes)

Keep the desired function key pressed until the display of the locomotive function flashes.

The function has been assigned to this key.



Release the rotary knob to display the locomotive address. You are back in the menu ‘Locomotive control’.

If you delete a locomotive address from the stack, you will also delete the assignments of the function keys for this address.
If you re-enter the locomotive address into the stack, you will need to re-assign the function keys (⇨p. 24).

9.4 Setting a locomotive function to permanent or temporary operation

You can set functions F1 to F28 to permanent or temporary operation.

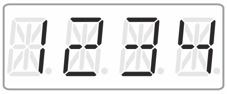
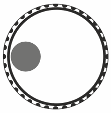
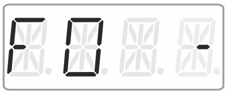
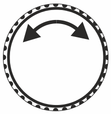
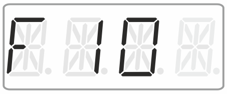
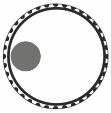
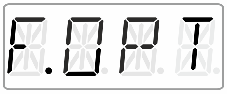
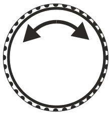
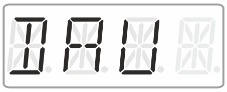
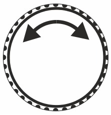
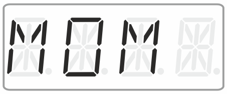
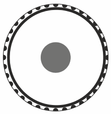
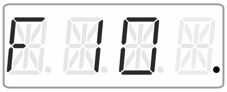
Permanent operation:

Press the key once to enable the function and twice to disable the function.

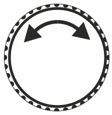
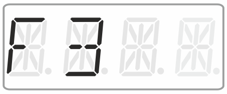
Temporary operation:

This function is enabled as long as the corresponding key is pressed. As soon as the key is released, the function is disabled.

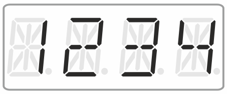
This setting is stored in the command station LZ100/LZV100. When calling up a locomotive address, the LH01 queries the setting from the LZ100/LZV100. This setting can be made individually for each function and locomotive address.

Action	Display	Explanation
		Select the desired locomotive address for which you would like to change a function.
		Press the left side of the rotary knob until the LED to the left shines. The locomotive function selected last is displayed. A dash on the right indicates that the function is enabled.
		Turn the rotary knob to display the function that you would like to set to permanent or temporary operation.
		Click left. ‘F.OPT’ is displayed.
		Release and …
		… click until the desired setting of the locomotive function is displayed.
		Press the centre of the rotary knob to set and store the setting in the command station. The dot on the right indicates the setting ‘temporary operation’.

Either …

		select another function for which you would like to change a setting …

… or …

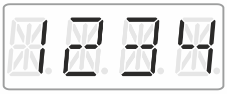
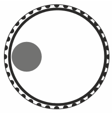
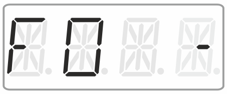
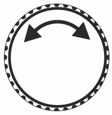
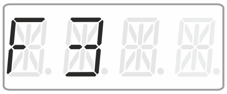
		… press ‘Esc’ to return to ‘Locomotive control’.

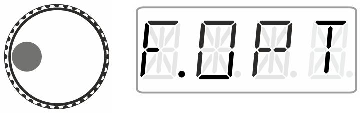
9.5 Assigning function acronyms to locomotive functions

Always the same question: ‘Which function switches the interior lighting?’

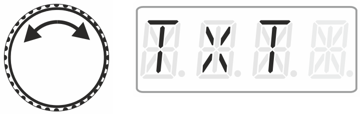
To make it easier to recall functions, you can assign an acronym to each function.

> The function acronym is stored in the LH01 with the corresponding locomotive address in the stack. If you are controlling the same locomotive address with another LH01, the function acronyms will not be transferred automatically.

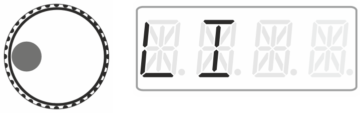
Action	Display	Explanation
		Select the desired locomotive address to assign an acronym to a function.
		Press the left side of the rotary knob until the LED to the left shines. The locomotive function selected last is displayed. A dash on the right indicates that the function is enabled.
		Turn the rotary knob to display the function to which you would like to assign an acronym.



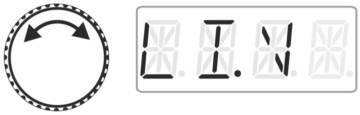
Click left. ‘F.OPT’ is displayed.



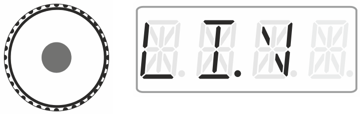
Turn the rotary knob to select ‘TXT’.



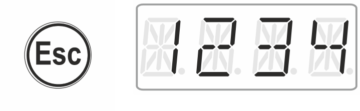
Click left. The first possible name is displayed.



Turn the rotary knob to select the desired name from the list.

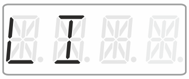


Press the centre of the rotary knob to assign the acronym to the function number.

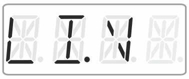


Press 'Esc' to return to ‘Locomotive control’.

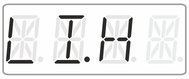
9.5.1 List of acronyms:



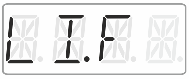
General lighting



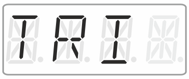
Lighting front



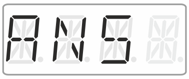
Lighting back



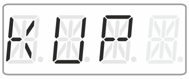
Lighting cab



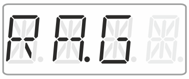
Thunderer whistle



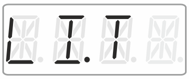
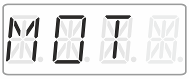
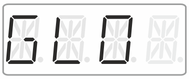
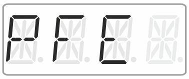
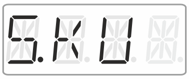
Announcements

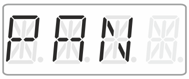
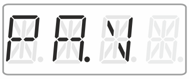
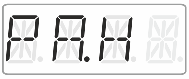
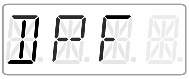


Coupling

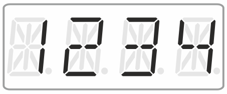
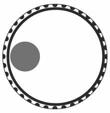
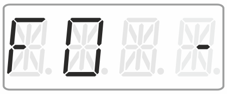
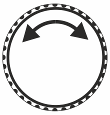
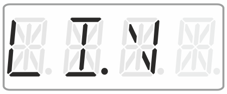
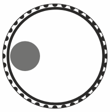
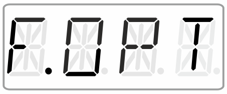
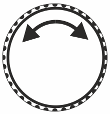
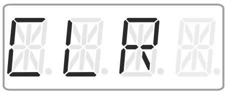


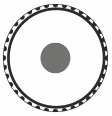
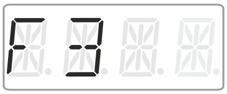
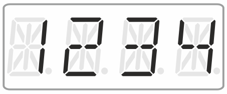
Shunting mode

	Lighting driving mechanism
	Engine
	Bell
	Whistle
	Coupling sound

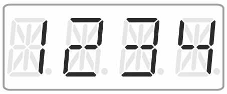
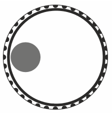
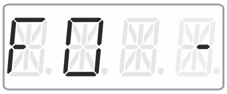
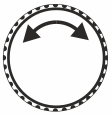
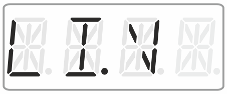
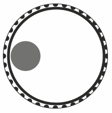
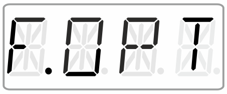
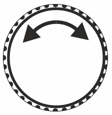
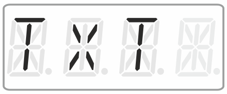
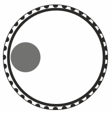
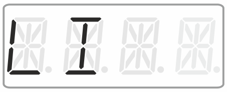
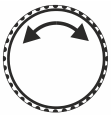
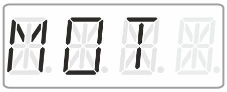
	Pantograph
	-front
	-back
	Steam generator

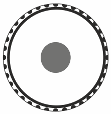
9.6 Deleting a function acronym

Action	Display	Explanation
		Select the desired locomotive address for which you would like to assign an acronym to a function.
		Press the left side of the rotary knob until the LED to the left shines. The locomotive function selected last is displayed. A dash on the right indicates that the function is enabled.
		Turn the rotary knob to display the function whose acronym you would like to delete.
		Click left. ‘F.OPT’ is displayed.
		Turn the rotary knob to select ‘CLR’.

		Click the centre of the rotary knob to delete the assignment. The function number is displayed again.
		Press ‘Esc’ to return to ‘Locomotive control’.

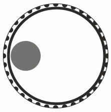
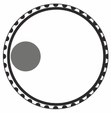
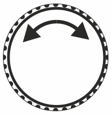
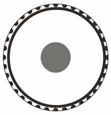
9.7 Changing a function acronym

Action	Display	Explanation
		Select the desired locomotive address for which you would like to change an acronym for a function.
		Press the left side of the rotary knob until the LED to the left shines.
		Turn the rotary knob to display the function whose acronym you would like to change.
		Click left. ‘F.OPT’ is displayed.
		Turn the rotary knob to select ‘TXT’.
		Click left. The first possible name is displayed.
		Turn the rotary knob to select the desired name from the list.

	1234	Click the centre of the rotary knob to save the change to the acronym for the function.
Esc	1234	Press ‘Esc’ to return to ‘Locomotive control’.

9.8 Deleting all function acronyms

You can delete all acronyms assigned to a locomotive address in a single step.

Action	Display	Explanation
	1234	Select the desired locomotive address for which you would like to change an acronym for a function.
	F0 -	Press the left side of the rotary knob until the LED to the left shines.
	F.OPT	Click left. ‘F.OPT’ is displayed.
	CR.A	Turn the rotary knob to select ‘CR:A’.
	F0 -	Click the centre of the rotary knob to delete all acronyms. You are back in the function menu.
Esc	1234	Press ‘Esc’ to return to ‘Locomotive control’.

10 Double traction (Double Header)

With the LH01 it is easy to assemble two locomotives in a double traction and to control them as if they were one.

10.1 Requirements to assemble a double traction

Before assembling two locomotives in a double traction, you have to

- enter each locomotive address in the stack of the LH01.
- set the speed step of each locomotive to 0 (standstill).

You cannot assemble a conventional locomotive (address 0) in a double traction! The attempt to do so will result in an error message.

10.2 Assembling two locomotives in a double traction

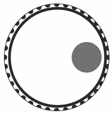
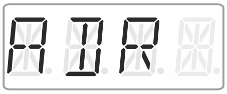
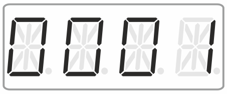
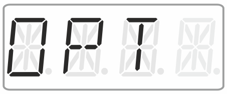
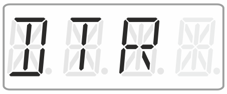
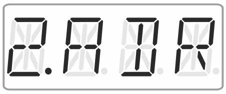
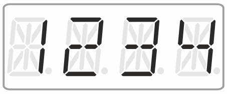
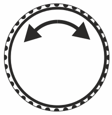
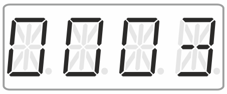
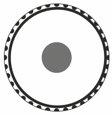
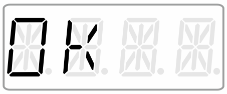
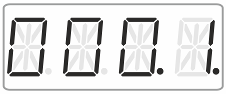
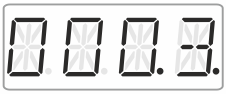
Select the first locomotive (here: the locomotive with the address 1) from the stack and drive it to the location on the layout where you want to couple it to the second locomotive.

Select the second locomotive from the stack (here: the locomotive with the address 3) and drive it to the first locomotive.

Ensure that both locomotives are driving into the same direction.

It is possible that the display of one locomotive indicates ‘forward’ while the display of the other locomotive indicates ‘backward’ since the direction of travel is locomotive-dependent.

Proceed as follows:

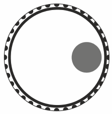
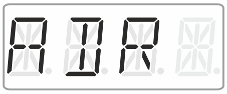
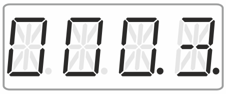
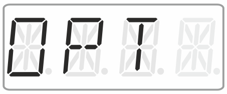
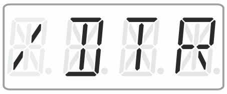
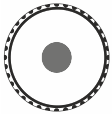
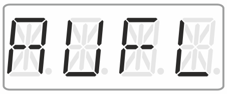
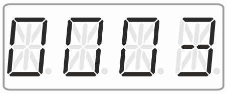
Action	Display	Explanation
		Press the left side of the rotary knob until the LED to the left shines.
		Release the knob to display the locomotive address used last. Here: locomotive address 1.
		Click right. ‘F.OPT’ is displayed.
		Release the rotary knob to enter the options menu. The first menu shows the double traction. If ‘DTR’ is not displayed, turn the rotary knob until ‘DTR’ is displayed.
		Click right. ‘2.ADR’ is displayed.
		Release the rotary knob to display the first address in the stack.
		Turn the rotary knob until the address of the second locomotive that you want to add to the double traction is displayed.
		Press the centre of the rotary knob. ‘OK’ is displayed.
		The addresses of the two locomotives in the double traction are now marked by two dots on the right as being part of a double traction.
		

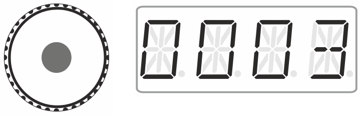
You can control the two locomotives assembled in the double traction as if they were one. Both locomotives will receive control commands in sequential order.

Both locomotives receive the same control and speed commands. Commands for switching functions will only be received by the locomotive that has been selected from the stack.

10.3 Deleting a double traction

To delete a double traction ensure that the speed step of the double traction is set to 0, i.e. that both locomotives are standing still. Select one of the two addresses from the stack and proceed as follows:

Action	Display	Explanation
		Press the right side of the rotary knob until the LED to the right shines.
		Release the rotary knob to display the locomotive address used last. Here: locomotive address 3. The two dots at the bottom right indicate that the locomotive is part of a double traction.
		Click right. ‘F.OPT’ is displayed.
		Release the rotary knob to display the locomotive address used last. The factory setting is locomotive address 3. Release the rotary knob to display the option to delete the double traction.
		Press the centre of the rotary knob. ‘AUFL’ is displayed, followed by …
		… the flashing locomotive address. Press 'Esc' to cancel the deletion process.



Press the centre of the rotary knob again to delete the double traction.

The locomotives can now be controlled separately.

10.4 Error messages during double tractions

When assembling a double traction you may receive the following error messages:

ERR 24:
- The locomotive address was not entered into the stack before adding the locomotive to the double traction, or
- you tried to add a conventional locomotive (address 0) to a double traction.

ERR 25: One of the two locomotives that you would like to add to the double traction has already been called up by another manual control.

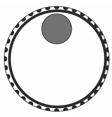
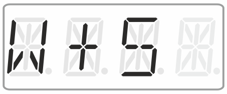
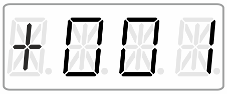
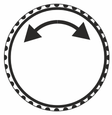
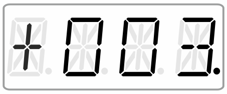
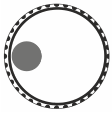
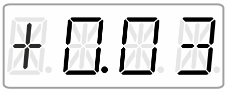
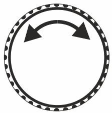
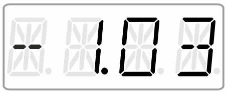
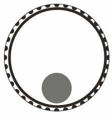
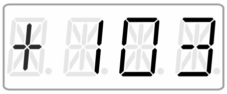
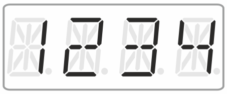
ERR 26: One of the two locomotives that you would like to add to the double traction is already part of another double traction.

ERR 27: The speed step of one of the two locomotives was not set to 0 when you assembled/deleted the double traction.

Press 'Esc' to return to ‘Locomotive control’.

11 Switching points and signals

The LH01 facilitates the switching of points and signals (and other accessories) in the address range 1 to 999.

Action	Display	Explanation
		Press the top of the rotary knob until the LED at the top shines.
		Release the rotary knob to display the point address used last.
		Turn the rotary knob to change the ‘single’ digit of the point address.
		Click right or left to select another digit. Your selection is indicated by a dot next to the digit.
		Turn the rotary knob to change the selected digit of the point address.
		Press the bottom of the rotary knob to change the setting of the point.
Esc		Press ‘Esc’ to return to ‘Locomotive control’.

12 Setting (programming) locomotive decoders (PoM)

A simple example of a decoder setting that can be changed is the so-called starting delay. The starting delay determines whether increasing the speed step results in an immediate increase (small value) or in a gradual increase (high value) of the locomotive's speed.

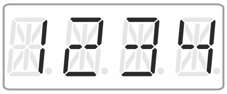
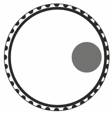
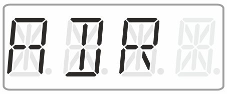
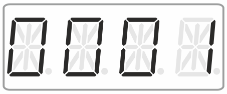
'Programming' means changing the settings of locomotive decoders.

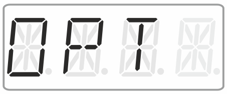
Settings are stored as numerical values in so-called CVs ('Configuration Variables'). Which settings of a locomotive decoder can be changed is described in the corresponding operating manual.

Further detailed information on settings and CVs of Digital plus decoders can be found in the 'Manual locomotive decoders'. You can download this manual on the following website:

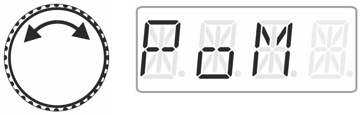
http://www.lenz-elektronik.de/download.php

The LH01 uses **'Programming in operational mode'** (PoM) to set decoder settings. The advantage of PoM is that the locomotive may be located anywhere on the layout rather than be placed on a specific programming track.

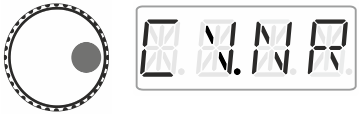
Action	Display	Explanation
		Select the address of the locomotive whose CVs (settings) you would like to change (⇨p. 15).
		Press the right side of the rotary knob until the LED to the right shines.
		Release the rotary knob to display the locomotive address used last. Here: locomotive address 1.



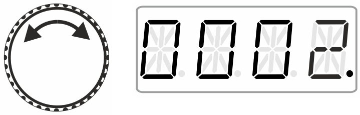
Click right until ‘OPT’ is displayed.



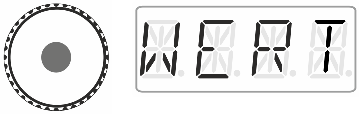
Turn the rotary knob until ‘PoM’ is displayed.



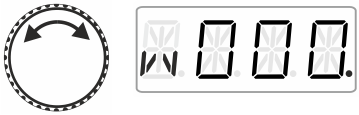
Press right. Now indicate which CV you would like to change.



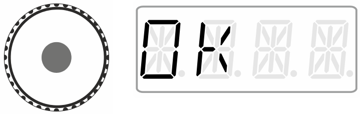
Turn the rotary knob and enter the number of the CV that you would like to change. Proceed as described under setting a locomotive address (⇨p. 16). The initial value suggested is CV2.



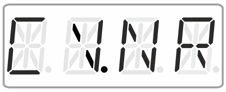
Click the centre of the rotary knob to enter the value.



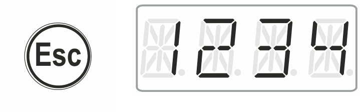
Turn the rotary knob and enter the value that you would like to enter into the CV. Proceed as described under setting a locomotive address (⇨p. 16).



Confirm the value by pressing the centre of the rotary knob. This will launch the entering process.



You can now select and change another CV or …



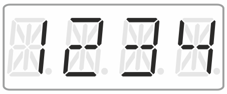
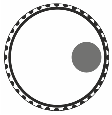
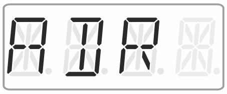
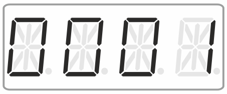
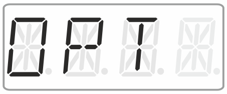
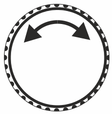
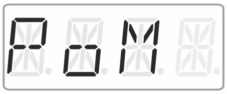
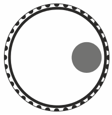
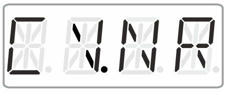
… press 'Esc' to return to ‘Locomotive control’.

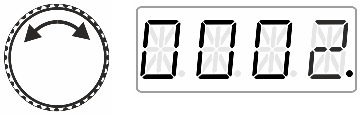
12.1 Reading CVs via PoM and the address display LRC120

It is possible to read CV values via PoM during operation. Requirements:

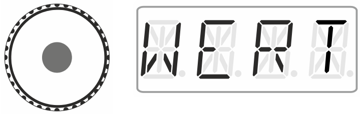
- A RailCom-able locomotive decoder
- The locomotive is located in a track section monitored by the address display LRC120.
- RailCom transmission is enabled in the decoder.

Information on how to connect the address display LRC120 as well as the settings of RailCom-able locomotive decoders can be found in the corresponding operating manuals.

Action	Display	Explanation
		Select the address of the locomotive whose CVs (settings) you would like to read (⇨p. 15).
		Press the right side of the rotary knob until the LED to the right shines.
		Release the rotary knob to display the locomotive address used last. Here: locomotive address 1.
		Click right until ‘OPT’ is displayed.
		Turn the rotary knob until ‘PoM’ is displayed.
		Press right. Now indicate which CV you would like to read or change.

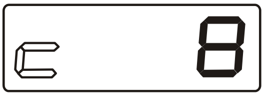


Turn the rotary knob and enter the value of the CV that you would like to read or change. Proceed as described under setting a locomotive address (⇨p. 16). The initial value suggested is CV2.



Press the centre of the rotary knob to enter the value.

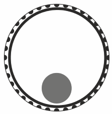
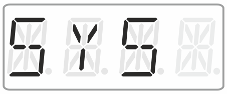
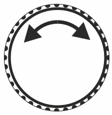
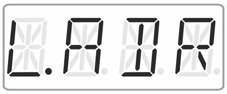
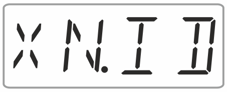
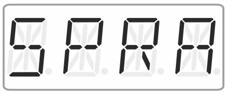
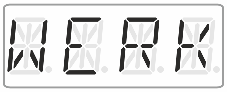
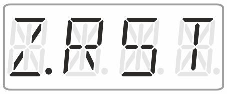
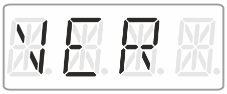
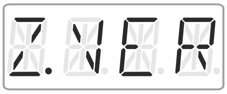
Press the centre of the rotary knob to send a PoM read command to the decoder which will transmit the content of the CV via RailCom. The address display LRC120 will receive this information and display it for approx. 3 seconds ('c' is flashing on the left of the display, the value is shown on the right).

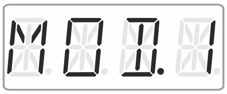


(Display of the LRC120)

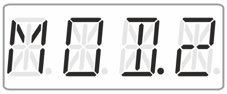
13 System settings

The system settings are accessed from the top operating level, the locomotive control.

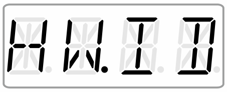
Action	Display	Explanation
		Press the bottom of the rotary knob until the LED at the bottom shines. ‘SYS’ is displayed, followed by the first sub menu of the system settings.
		Turn to select one of the following system settings:
		Setting and reading a locomotive address on the programming track
		Setting and reading the XpressNet address
		Language settings
		Resetting the LH01
		Resetting the command station (LZV100/LZ100)
		Displaying the version number of the LH01
		Displaying the version number of the command station



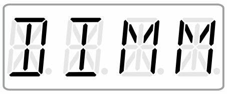
Setting club mode 1



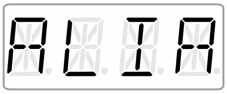
Setting club mode 2



Displaying the hardware ID



Setting the brightness of the display

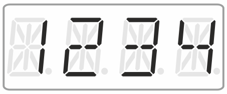
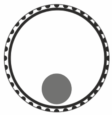
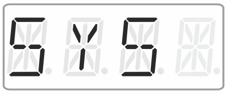
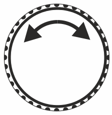
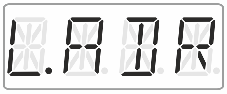
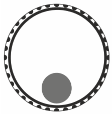
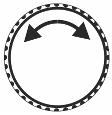
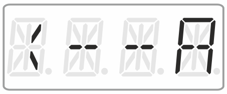
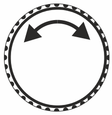
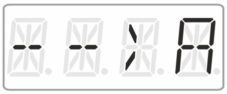


Enabling/disabling the displaying of function acronyms

The following sections describe the different system settings.

13.1 Setting and reading a locomotive address on the programming track

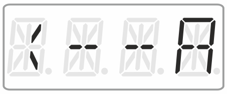
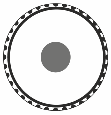
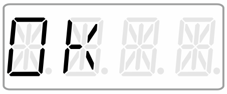
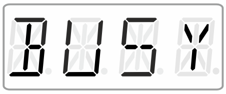
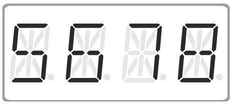
Place the locomotive whose address you would like to set or read on the programming track. The programming track is a track section that is separated from the rest of the layout and connected to terminals P and Q of the command station LZV100/LZ100. Detailed information on the programming track can be found in the operating manual of the LZ100 / LZV100.

Action	Display	Explanation
		Proceed from ‘Locomotive control’ (address or speed step are displayed)…
		… press the bottom of the rotary knob until the LED at the bottom shines. ‘SYS’ is displayed, followed by the first sub menu of the system settings.
		Select ‘L.ADR’.
		Press the bottom of the rotary knob.
		Turn the rotary knob to select ‘Read address’
		or ‘Write address’.

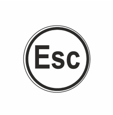
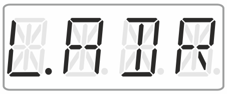
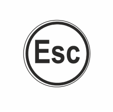
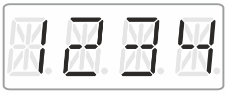
13.1.1 Reading a locomotive address

Place the locomotive whose address you would like to read on the programming track.

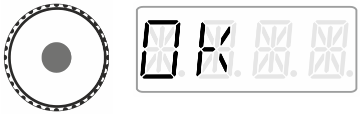
Proceed as described under ‘Setting and reading a locomotive address on the programming track’.

Action	Display	Explanation
		Select ‘Read address’.
		Press the centre of the rotary knob to start the reading process.
		The reading process takes some time. The display shows ‘BUSY’.
		Once the reading process is completed, the identified locomotive address is displayed.

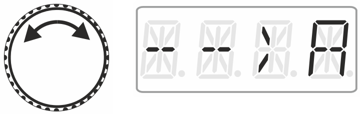
Either

		press 'Esc' to return to read/write address and …
		… press 'Esc' to return to ‘Locomotive control’

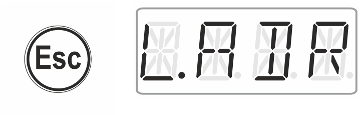
or



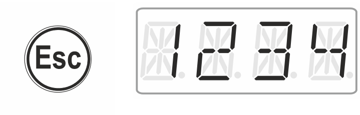
press the centre of the rotary knob. The display shows ‘OK’…



You are back in the menu read/write address. You can choose between writing an address (as you may want to change the address that you have read). In this case, proceed as described in section "Writing a locomotive address", ⇨p. 42.



Press 'Esc' to return to the system menu. Turn the rotary knob to select another system menu or …



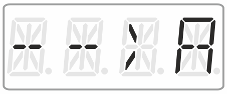
... press 'Esc' to return to ‘Locomotive control’.

13.1.2 Writing a locomotive address

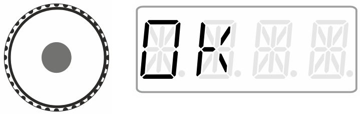
Place the locomotive whose address you would like to write on the programming track.

Proceed as described under ‘Setting and reading a locomotive address on the programming track ‘.

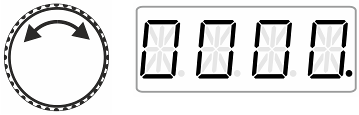
Action Display Explanation



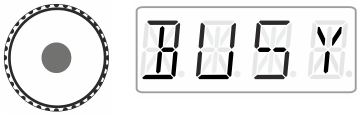
Select ‘Write address’.



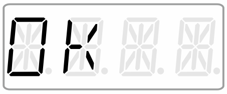
Confirm your selection by pressing the centre of the rotary knob. ‘OK’ is displayed.



Set the address that you would like to write into the locomotive. To set the address, proceed as described under ‘Entering a new locomotive address into the stack‘ (⇨p. 16).

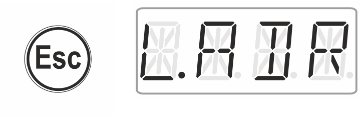


Press the centre of the rotary knob to launch the writing process. The display shows ‘BUSY’.



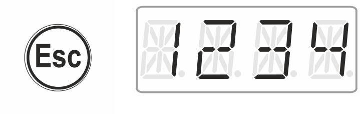
If the writing process was successful, ‘OK’ (‘sent’) will be displayed.

Either



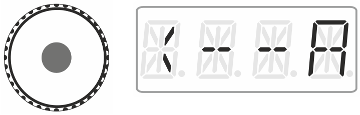
press 'Esc' to return to the menu ‘L.ADR’.

You can now select another system menu …

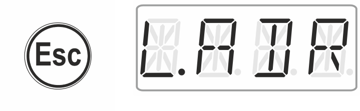


… or press 'Esc' to return to ‘Locomotive control’.

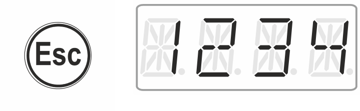
or



press the centre of the rotary knob. You are back in the selection/menu read/write address. You can select between reading an address to verify the address (proceed as described in section Reading a locomotive address, ⇨p. 41).



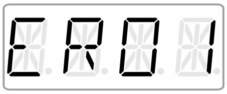
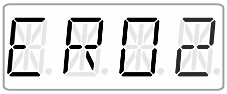
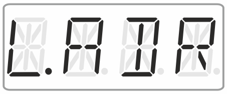
Press 'Esc' to return to the system menu. Turn to select another system menu …



... or press 'Esc' to return to ‘Locomotive control’.

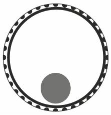
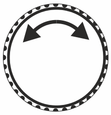
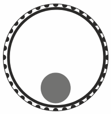
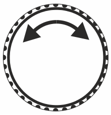
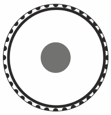
13.1.3 Error messages when reading or writing a locomotive address

The following error messages may be displayed while reading or writing a locomotive address:

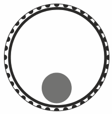
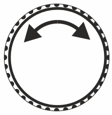
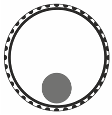
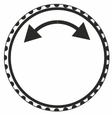
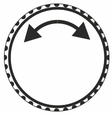
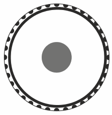
Action	Display	Explanation
		A current overload (short circuit) occurred during reading or writing. The receiver may not be connected properly or may be faulty.
		The receiver does not respond during reading or writing, i.e. the receiver may not be connected properly to the programming socket of the command station LZ100/LZV100 (the digital locomotive may not be placed properly on the programming track).
Esc		Press 'Esc' to return to the system menu ‘L.ADR’.

13.2 Setting and reading the XpressNet address

For a fault-free exchange of information with the command station, each input device connected to XpressNet (XBUS) must have its own *device address*. It is, therefore, necessary to ensure that all connected devices have different addresses. Up to 31 devices can be connected to the XpressNet, i.e. addresses 1 to 31 can be set. Ex-factory, each LH01 manual control is set to address 03 (the LH100 is delivered with address 01, the LH90 with address 02). If you would like to use two or more manual controls you will have to set a different address for each control.

Action	Display	Explanation
	1234	Proceed from ‘Locomotive control’ (address or speed step are displayed)…
	SYS	… press the bottom of the rotary knob until the LED at the bottom shines. ‘SYS’ is displayed, followed by the first sub menu of the system settings.
	XN.ID	Select ‘XN.ID’.
	ID.03	Press the bottom of the rotary knob. The XpressNet address currently set is displayed (the factory setting is address 3).
	ID.05	Turn to select the desired new XpressNet address.
	XN.ID	Press the centre of the rotary knob to confirm your selection.
Esc	1234	Turn to select another system setting or press 'Esc' to return to ‘Locomotive control’.

13.3 Setting the language

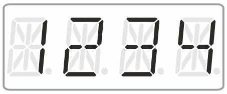
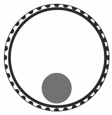
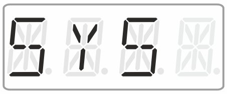
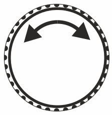
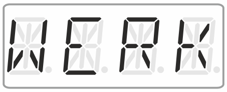
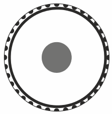
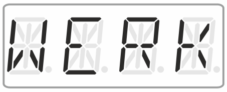
Action	Display	Explanation
	1234	Proceed from 'Locomotive control' (address or speed step are displayed)…
	SYS	… press the bottom of the rotary knob until the LED at the bottom shines. 'SYS' is displayed, followed by the first sub menu of the system settings.
	SPRA	Select 'SPRA'.
	DE	Press the bottom of the rotary knob. The language currently set is displayed.
	EN	Turn to select German (DE) or English (EN).
	DE	
	SPRA	Press the centre of the rotary knob to confirm your selection.
Esc	1234	Turn to select another system setting or press 'Esc' to return to 'Locomotive control'.

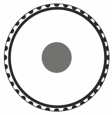
13.4 Resetting the LH01

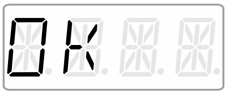
This system setting resets the factory settings of the LH01.

Resetting the LH01 to the factory settings will delete all settings made!

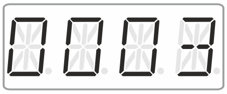
- The stack is assigned addresses 1, 2, and 3.
- The function keys are assigned functions F0, F1 and F2 for these addresses.
- The XpressNet address is set to 3.
- All acronyms are deleted.
- The language is set to German.
- The brightness is set to 80%.

Action	Display	Explanation
		Proceed from ‘Locomotive control’ (address or speed step are displayed)…
		… press the bottom of the rotary knob until the LED at the bottom shines. ‘SYS’ is displayed, followed by the first sub menu of the system settings.
		Select ‘WERK’.
		Click the centre of the rotary knob. ‘WERK’ flashes in the display. Press 'Esc' to cancel the resetting process.





Press the centre of the rotary knob again to reset the LH01. ‘OK’ is displayed.

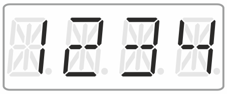


You are now in the menu ‘Locomotive control’. Address ‘0003’ is displayed.

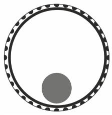
13.5 Resetting command stations (LZV100/LZ100)

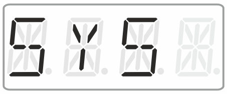
Select this option to reset the command station (LZV100 / LZ100).

Action Display Explanation



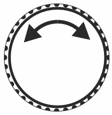
Proceed from ‘Locomotive control’ (address or speed step are displayed)…

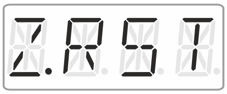




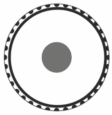
… press the bottom of the rotary knob until the LED at the bottom shines.

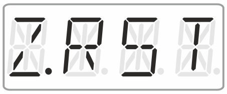
‘SYS’ is displayed, followed by the first sub menu of the system settings.



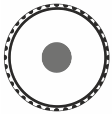


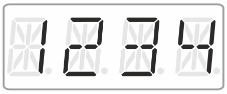
Select ‘Z.RST’.





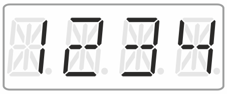
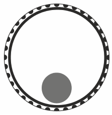
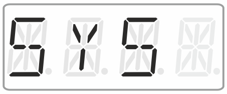
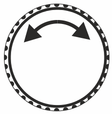
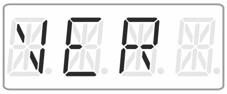
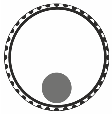
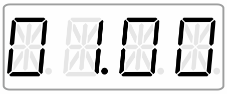
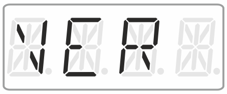
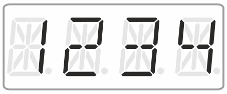
Press the centre of the rotary knob to confirm your selection. ‘Z.RST’ flashes as a last warning before resetting. **Press 'Esc' to cancel the resetting process.**



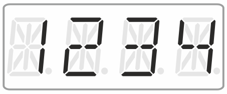
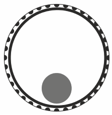
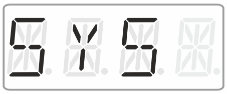
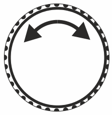
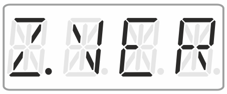
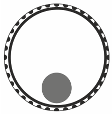
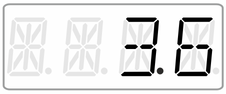
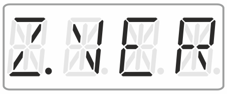
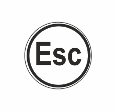
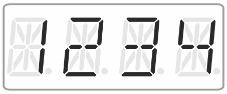


Press the centre of the rotary knob again to reset the command station. You are now in the menu ‘Locomotive control’.

13.6 Displaying the version number of the LH01

Action	Display	Explanation
		Proceed from ‘Locomotive control’ (address or speed step are displayed)…
		… press the bottom of the rotary knob until the LED at the bottom shines. ‘SYS’ is displayed, followed by the first sub menu of the system settings.
		Select ‘VER’.
		Press the bottom of the rotary knob to display the version number of the LH01. Here: version 1.0.
		Release to display the system setting ‘VER’. Turn the rotary knob to select another system setting or …
		… press 'Esc' to return to ‘Locomotive control’.

13.7 Displaying the version number of the command station

Action	Display	Explanation
		Proceed from ‘Locomotive control’ (address or speed step are displayed)…
		… press the bottom of the rotary knob until the LED at the bottom shines. ‘SYS’ is displayed, followed by the first sub menu of the system settings.
		Select ‘Z.VER’.
		Press the bottom of the rotary knob to display the version number of the LH01. Here: version 3.6.
		Release the rotary knob to display the system setting ‘Z.VER’. Turn the rotary knob to select another system setting or …
		… press 'Esc' to return to ‘Locomotive control’.

13.8 Setting the club mode

What is the club mode?

Let us assume that you would like to operate your model railway layout together with other model railway fans.

To this end, you would like to hand the manual control LH01 to somebody who has never used the device. You can simplify operation by hiding most of the operating functions.

Or you would like to prevent someone from selecting a locomotive that was not assigned to him or her or from making other system settings.

To this end, three modes are available:

Mode 1: It is only possible to control the locomotive set and to switch the functions assigned to function keys A, B and C. It is also possible so switch points and signals. All other operating functions of the LH01 are blocked.

Mode 2: It is only possible to control the locomotive set and to switch the functions assigned to function keys A, B and C. All other operating functions of the LH01 are blocked.

Mode 0: This is the factory setting. All settings and functions of the LH01 are available.

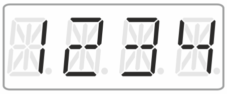
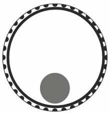
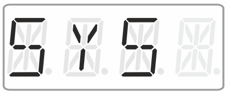
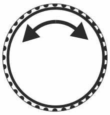
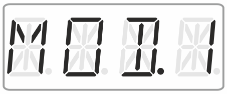
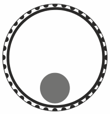
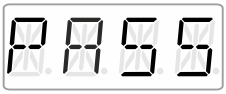
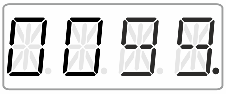
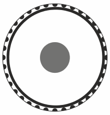
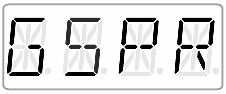
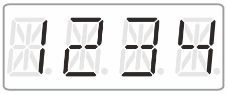
Mode 1 and mode 2 are secured by a password (a 4-digit number). This password is required to return to mode 0.

Note down the password!

If you forget the password, you will not be able to return to mode 0.

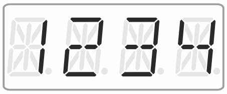
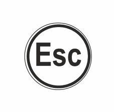
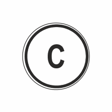
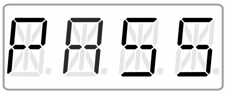
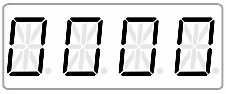
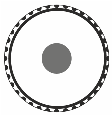
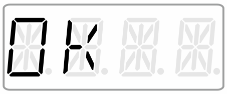
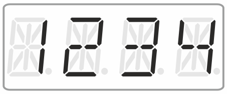
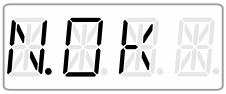
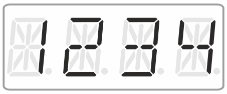
If you forget the password, please contact our support service.

13.8.1 Setting Mode 1 or mode 2

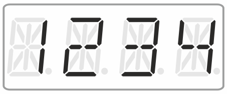
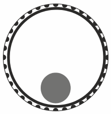
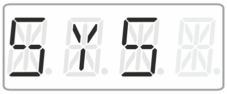
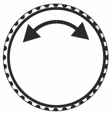
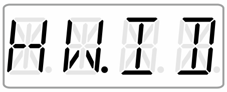
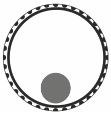
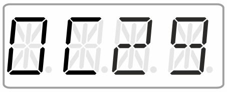
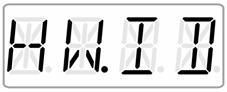
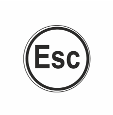
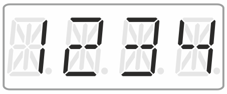
Action	Display	Explanation
		Proceed from 'Locomotive control' (address or speed step are displayed)…
		… press the bottom of the rotary knob until the LED at the bottom shines. 'SYS' is displayed, followed by the first sub menu of the system settings.
		Select the desired mode. If the LH01 is set to mode 0, you can select between 'MOD.1' and 'MOD.2'. If the LH01 is set to mode 1 or 2, you can only select 'MOD.0'.
		Press the bottom of the rotary knob to display 'PASS'. Release the rotary knob
		… and the password '0099' will be suggested to you. Click right or left to select one of the four digits. Turn the rotary knob to change a digit and enter the desired password.
		Complete the process by pressing the centre of the rotary knob. 'GSPR' is displayed.
		The LH01 will automatically return to 'Locomotive control'. The restrictions of the selected mode are applied.

13.8.2 Setting mode 0

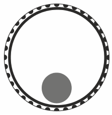
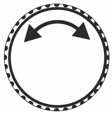
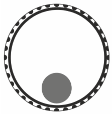
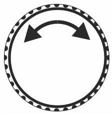
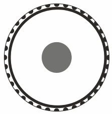
If you would like to reset a LH01 that is set to club mode 1 or mode 2 to the ‘normal’ mode, proceed as follows:

Action	Display	Explanation
		Proceed from ‘Locomotive control’ (address or speed step are displayed)…
		… press the keys 'Esc' and 'C' simultaneously to display…
		… ‘PASS’.
		Release the keys to enter the password.
		Press the centre of the rotary knob to confirm the password. If you have entered the correct password, ‘OK’ will be displayed …
		…and you will return to ‘ Locomotive control’. The locomotive address or the speed step are displayed. All functions of the LH01 are available again.
		If you have entered an incorrect password, ‘N.OK’ will be displayed.
		The LH01 remains in the selected club mode and returns to ‘Locomotive control’. The locomotive address or the speed step are displayed. Repeat the above steps, using the correct password.

13.9 Displaying the hardware ID

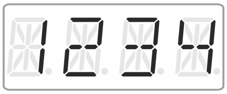
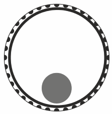
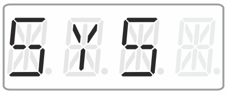
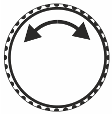
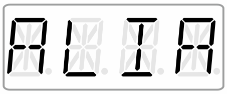
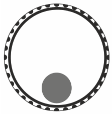
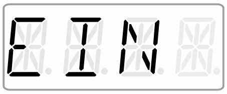
Action	Display	Explanation
		Proceed from ‘Locomotive control’ (address or speed step are displayed)…
		… press the bottom of the rotary knob until the LED at the bottom shines. ‘SYS’ is displayed, followed by the first sub menu of the system settings.
		Select ‘HW.ID’.
		Press the bottom of the rotary knob to display the hardware ID of the LH01. Here: ID 0C29.
		Release to display the system setting ‘HW.ID’. Turn the rotary knob to select another system setting or …
		… press 'Esc' to return to ‘Locomotive control’.

13.10 Setting the brightness of the display

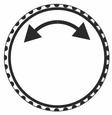
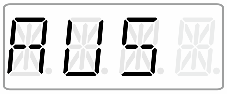
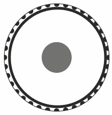
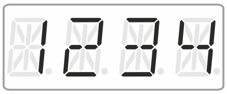
Action	Display	Explanation
	1234	Proceed from 'Locomotive control' (address or speed step are displayed)…
	SYS	… press the bottom of the rotary knob until the LED at the bottom shines. 'SYS' is displayed, followed by the first sub menu of the system settings.
	DIMM	Select 'DIMM'.
	0100	Press the bottom of the rotary knob. The brightness value currently set is displayed. The factory setting is 80%.
	0050	Turn the rotary knob to change the brightness value. The result will be reflected in a change in brightness.
	1234	Click the centre of the rotary knob to confirm your selection.

13.11 Enabling/Disabling the displaying of function acronyms

> Function acronyms can only be displayed if you have assigned acronyms to locomotives functions (⇨p. 24).
>
> Ex-factory, the displaying of acronyms is enabled.

Action	Display	Explanation
		Proceed from ‘Locomotive control’ (address or speed step are displayed)…
		… press the bottom of the rotary knob until the LED at the bottom shines. ‘SYS’ is displayed, followed by the first sub menu of the system settings.
		Select ‘ALIA’ …
		… and press the bottom of the rotary knob. Release the rotary knob to display the currently set status.

‘EIN’:	Function acronyms are displayed.
‘AUS’:	Function acronyms are not displayed.

		Turn to select the desired status…
		… press the centre of the rotary knob to confirm your selection and return to ‘Locomotive control’.

14 Technical appendix

14.1 Help in case of malfunction

Malfunction	Cause	Correction
The display of the LH01 remains dark.	Not connected to a power supply.	Check the cabling of the XpressNet and connected devices.
The locomotive address on the display flashes.	The selected address is already being used on a different manual control.	Select a different locomotive or turn the rotary knob to take over the locomotive.
‘AUS’ is displayed.	Another manual control has triggered an emergency shutdown.	Press the centre of the rotary knob to cancel the emergency shutdown.
	The command station or amplifier has triggered an emergency shutdown due to a short circuit.	Remove the short circuit. In case of an overload divide the layout into several power supply sections.
The display is too bright.	The dimming value of the display has been set to a maximum.	Decrease the dimming value.
The display is too dark.	The dimming value of the display has been set to a minimum.	Increase the dimming value.

If you contact us for help in case of malfunctions please provide a problem description as well as the following information:

- Version number of the command station
- Version number of the LH01
- Designation, version number and service number of all XpressNet connected XpressNet devices (additional manual controls, Interface etc.).

This will help us solve the problem. Thank you.

14.2 List of error messages

Error	**Error:**
ER01	Programming information: short circuit
ER02	Programming information: no information
ER06	Value outside permissible range
ER07	Command station ready
ER24	DTR/MTR: Locomotive not called up or locomotive address 0
ER25	DTR/MTR: Locomotive called up by another device
ER26	DTR/MTR: Locomotive part of another DTR/MTR
ER27	DTR/MTR: Locomotive speed not 0
ER28	DTR/MTR: Locomotive not part of multiple traction
ER29	DTR/MTR: Locomotive address no multiple traction basic address
ER30	Locomotive cannot be deleted from memory
ER31	Central memory full
ER40	Flash cannot be deleted
ER41	Time-out
ER42	Command station incompatible
ER43	Software incompatible
ER44	Speed step not supported
ER45	Error in locomotive stack
ER80	Transmission error
ER97	Error in data processing at command station LZ100/LZV100
ER98	Command sent to command station by manual control not part of command range
ER99	General system error

14.3 Display text / Languages

German	English	Meaning
ABBR	ESC	Cancel
ADR	ADR	Address
ALIA	AKA	Display/hide aliases
ANS	SAN	Function text: announcement
AUFL	DISS	Dissolve DTR
AUS	OFF	Function acronyms not displayed
AUS	HALT	Switch off voltage
AUTO	AUTO	Auto mode
BUSY	BUSY	Programming on programming track
CLR	DEL	Delete alias of active function
CR.A	DLA	Delete all aliases of active function
CV.AD	CV.AD	CV address
CV=	CV=	Not used
DAU	CON	Assign switching function to active function
DE	DE	German
DIMM	DIMM	Set display brightness
DPF	SG	Function text: steam
DTR	CCT	Mount double traction
/DTR	/CCT	Unmount double traction
EDIT	EDIT	Edit
EIN	ON	Switch on voltage
EIN	ON	Display function acronyms
EN	EN	English
ENTF	DEL	Remove address
F	F	Prefix for function F0…F28
FAHR	DRIV	Drive
FKT	FCT	Function
F.OPT	F.OPT	Function options
FSM	SSM	Speed step mode
GESE.	SENT	CV value sent
GLO	BL	Function text: bell
GSPR	LOCK	Blocked

German	English	Meaning
HW.ID	DV.ID	Hardware ID
KUP	CU	Function text: coupling
L.ADR	E.ADR	Read/write locomotive address
LI	LI	Function text: general lighting
LI.F	L.CB	Function text: lighting cabin
LI.H	L.RW	Function text: lighting back
LI.T	L.EG	Function text: lighting driving mechanism
LI.V	L.FW	Function text: lighting front
MAN.	MAN.	Manual mode
MOD.0	MOD.0	Administrator mode
MOD.1	MOD.1	Club mode 1
MOD.2	MOD.2	Club mode 2
MOM	MOM	Assign key function to active function
MOT	EG	Function text: engine
NEU	NEW	Add new address
N.OK	N.OK	Not ok
OK	OK	Confirmation
OPT	OPT	Options
PAN	PG	Function text: pantograph
PASS	CODE	Pass word
PA.H	P.RW	Function text: pantograph back
PA.V	P.FW	Function text: pantograph front
PFE	WH	Function text: whistle
PoM	PoM	Programming in operational mode
PROG	PROG	Programming mode
RA.G	SH	Function text: shunting mode
RATE	RATE	Not used
S.KU	SCU	Function text: coupling sound
SPRA	LANG	Language
STAT	STAT	Status
STOP	STOP	Emergency stop
SYS	SYS	System setting
TEXT	TEXT	Text

German	English	Meaning
TRI	SWH	Function text: thunderer whistle
TXT	TXT	Assign alias to active function
UPDA	UPDA	Update
UNLK.	UNLK.	Unblock
WAHL	PICK	Select menu point
WERK	RST	Factory setting
WERT	VAL	CV value
W+S	T+S	Points and signals
VER	VER	Version
XN.ID	XN.ID	XpressNet device address
Z.RST	C.RST	Reset command station
Z.VER	C.VER	Version command station
2.ADR	2.ADR	Second address
-->A	WRIT	Write locomotive address
<--A	READ	Read locomotive address
+	+	Indicator point setting
-	-	Indicator point setting or function status

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Lenz
ELEKTRONIK GMBH

Vogelsang 14
35398 Giessen
Hotline: 06403 900 133
Fax: 06403 900 155
www.lenz-elektronik.de
info@lenz-elektronik.de

Keep this operation manual for future reference!

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