PIKO

MODELLBAHNEN & GEBÄUDEMODELLE G

OUTDOOR & INDOOR

FÜR DRAUSSEN UND DRINNEN

POUR L'EXTÉRIEUR ET L'INTÉRIEUR

Navigator

Bedienungsanleitung

Operation Manual

Navigator
Operation Manual

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Please read this instruction manual thoroughly before starting up operation.

1. Description

The PIKO Navigator is among the most modern and confortable handheld controller for digitally controlled model railroad layouts. Its function is not limited merely to controlling the locomotives, but also offers additional, exclusive control capabilities. Some of the aforementioned functions are only available with newer software versions. These are annotated accordingly.

1.1 Overview of the Range of Functions

- Large, back-lit display with easy menu control
- Locomotive configuration with alphanumeric names and pictograms
- The pictogram library contains the PIKO models and a number of current garden railroad locos
- 10,239 available locomotive addresses
- 14/28/128 speed steps
- 2,048 switch addresses
- 32 automated functions for locomotives and switches
- 5 different programming types for decoder
- 16 programmable scissor crossings with up to 15 switches per crossing
- 99 functions per loco (function addresses F0...F28 + 60 Binary States)
- Parallel and serial functional data
- Up to 240 locomotive pictures (narrow and standard gauge
- Control 2 locomotives simultaneously
- 2 STOP keys (programmable STOP keys)
- Radio and cable operation (system-dependent)
- different programming modes
- Display of system performance / system load
- 2 x 2048 Switch and signal commands

1.2 Product Contents

The following components are included in the product contents of PIKO Navigator:
1 x PIKO Navigator
1 x connection cable
1 x instruction manual

Should any of these components be missing from the product contents, please contact your model train dealer. They will be happy to assist you.

Note: Batteries for radio operation are not included with the product contents. Please use three commercial AA batteries. Should you wish to use the Navigator's charging function, please use three (mignon) rechargeable batteries (AA / NiMH or NiCd). The charging function must be activated in a separate menu.

1.3 Form & Ergonomics

The PIKO Navigator is an ergonomically formed handheld controller. It is very easy to operate using one hand and is suitable both for left-handed as well as right-handed users. The battery box is optimally integrated in the reverse side of the handheld controller. A large graphics display provides detailed information regarding the status of the locomotive and the system. The PIKO Navigator enables the user to carry out two functions simultaneously. This includes, for example, controlling locomotives and operating switches or scissor crossings. In addition, the secondary function can be selected freely. Detailed information concerning this is given in the next chapters.

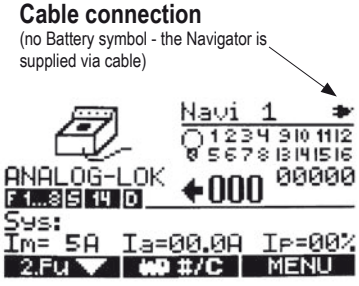
2. Operation

This chapter deals with the initial operation of the PIKO Navigator. The steps for the vehicle operation using the PIKO Navigator are very simple and can be carried out without specialized knowledge. The following explains the setup of the Navigator and the simple control of a locomotive.

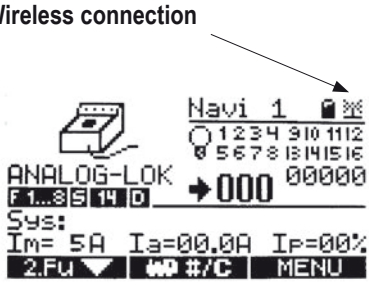
2.1 Connection

The PIKO Navigator is intended for the direct operation at the PIKO digital central (35010). It can be operated using a cable or radio signals (in connection with the PIKO wireless receiver (35018). After start-up, the PIKO Navigator logs into the command control via the cable or via radio signals. If a connection cannot be established, this will appear as a message on the display.
The current type of connection will be represented as a symbol in the display.

Cable connection
(no Battery symbol - the Navigator is supplied via cable)



Wireless connection



2.1.1 Switching On and Off

The navigator starts up automatically when a cable is connected. In the case of radio operation, the Navigator is switched on using the F key. Pressing the F key for a longer period of time (>1 sec.) shuts the Navigator off.

2.1.2 Entering the engine location and first vehicle operation

The locomotive selection key I or M2 brings you to the input window for the locomotive addresses.The desired locomotive for simple vehicle operation can be selected by entering a locomotive address using the keyboard, 0003, for example, and then confirming that selection using M3. Your locomotive can now be controlled using the control dial. First vehicle operation is immediately possible. The Navigator subsequently returns to Driving Mode (you can obtain the locomotive address in the instruction manual that came with your locomotive or decoder). The locomotives obtain their movement data with 28 speed steps and parallel operational data. Detailed function specifications, locomotive image, locomotive name, etc. are explained in the LOCOMOTIVE CONFIGURATION (point 4 of these instructions).

2.1.2.1 Vehicle operation with the PIKO analog throttle (35002)

The Navigator can also be used as a remote control for the PIKO analog throttle (in connection with a PIKO wireless receiver 35018).
You can find more specific information regarding connection and the range of functions in the instruction manual for the PIKO controller 35002.

2.1.3 Information concerning radio control

The PIKO Navigator uses a registration free and cost-free frequency band. It does not conflict with the prevalent LGB® radio system. Both systems can also be operated on the same system. Radio communication is bidirectional. Data transfer occurs at a high rate of speed and there is no risk of reduction. A radio transmission distance of 50 to 100 meters can easily be achieved outdoors. Indoors, the transmission distance can be limited by various construction materials. Please note that it is possible for disruptions to occur as a result of other radio components such as wireless computer mice or keyboards, garage door openers and radio links for audio transfer (audio headsets). This can affect the performance and range of the radio signal or bock it completely. Performance may be improved by changing channels (see chapter 5.5.2.1). In the event of simultaneous operation of multiple radio-navigators, these must be programmed with unique ID numbers.

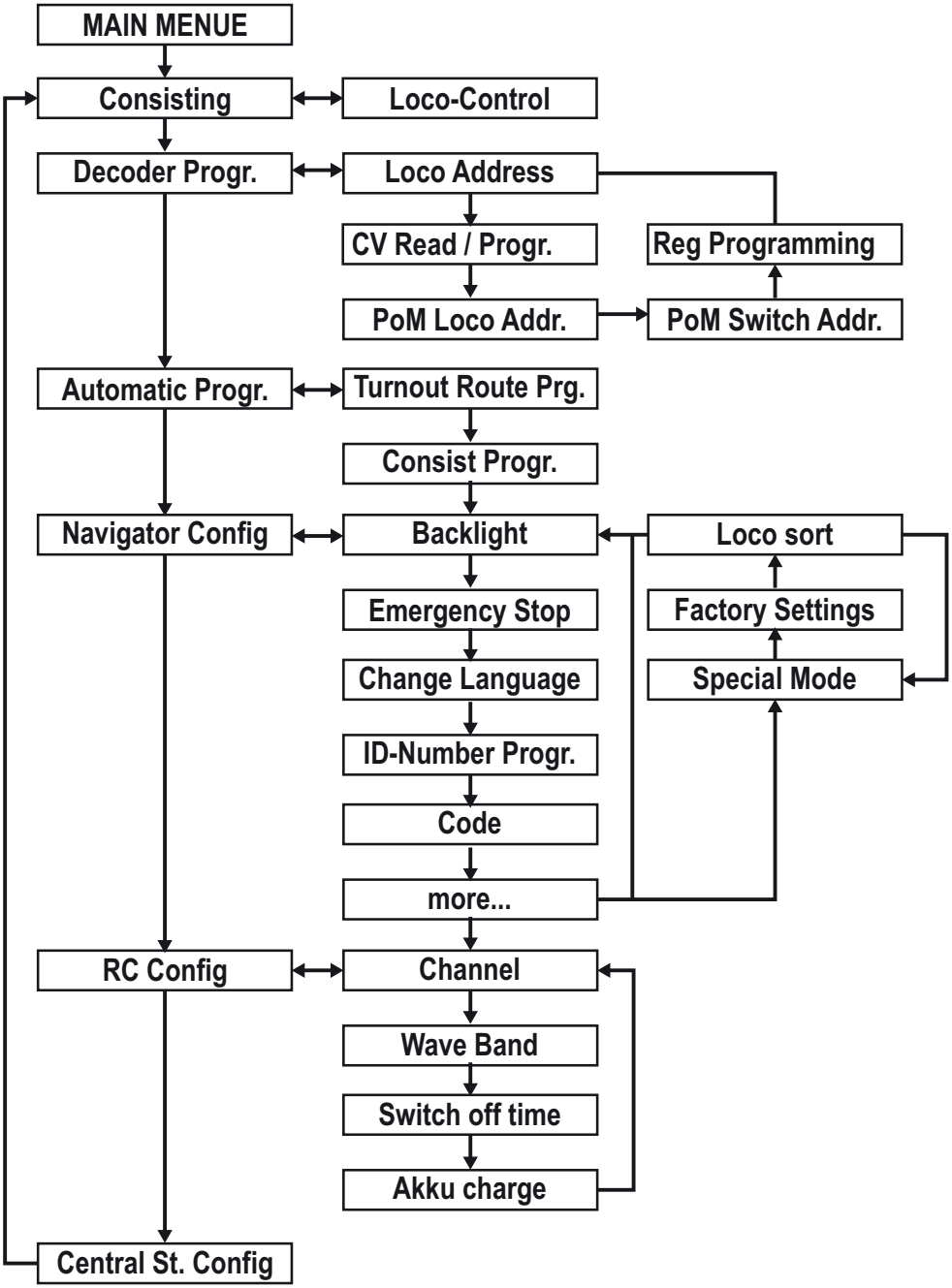
2.1.4 Operation with other control system

The PIKO Navigator can also be operated with the MASSOTH digital command controls DiMAX 1200Z, 1210Z, 800Z and LGB® MZS III. In addition, the handheld controller can also be operated on command controls with XpressNet® or via a separate wireless receiver.

2.1.5 Limited functions on MZS III

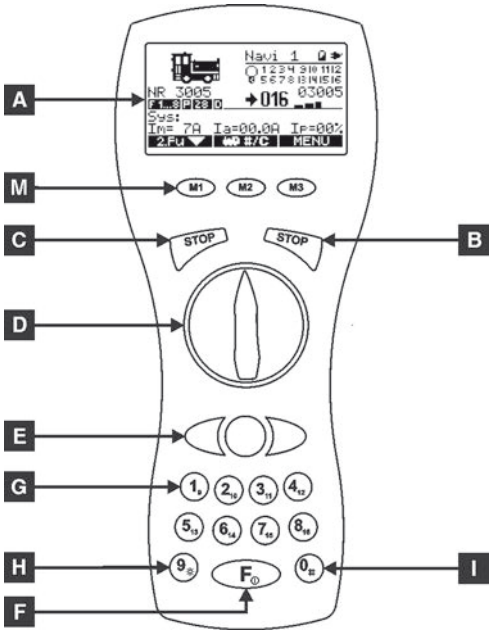
Only the 14 + 28 engine speed settings are usable. Only direct address programming + CV programming is possible (as of version 1.5 also referred to as CV). Read CV, PoM and register programming cannot be used. No automated functions are usable.

2.2 Menu overview diagram



2.3 Controls

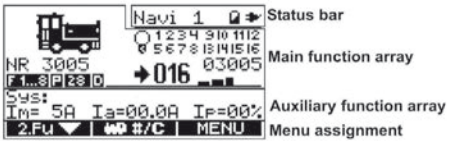
The PIKO Navigator has a variety of controls available. The function and configuration of the keys on the PIKO Navigator are depicted in this graphic overview.



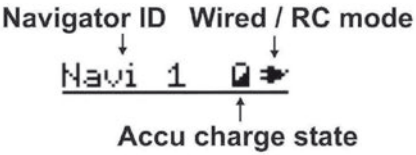
No.	Description
A	Display
M	Menu keys
B	Right STOP key
C	Left STOP key
D	Throttle for Speed control (only locomotive control)
E	Control of the second function (function selectable)
G	Key pad / function keys
H	Light function key / #9 key
I	Locomotive selection key / #0 key
F	Function level selection / Switching On / Off

2.3.1 The Display A

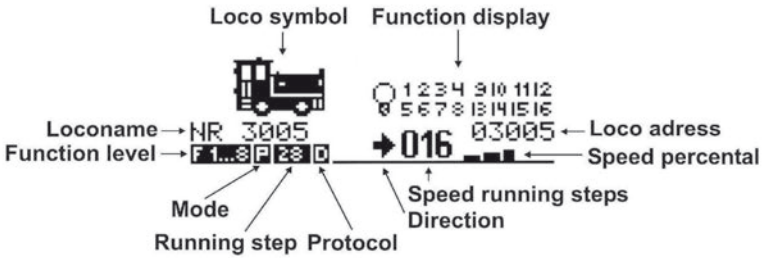
The large graphics display constantly provides detailedinformation regarding the status of the locomotive und the system. With a surface of over 14 cm2 and a dimension of 54 mm x 26 mm, the information is easily readable. Among other things, the display during operation shows the configuration data such as locomotive image, locomotive name, locomotive address, controllable speed steps, parallel or serial control of functions, active functions from 1 through 16, travel direction, current speed in speed steps, level indicator for speeds travelled, etc. The display's backlighting is switched on and off in the menu. The following gives the basic breakdown of the display:



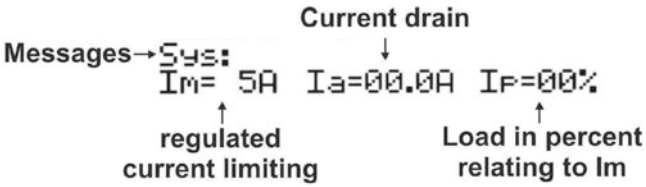
The status bar:



The primary function field:



The secondary function field displays the following information when activated:

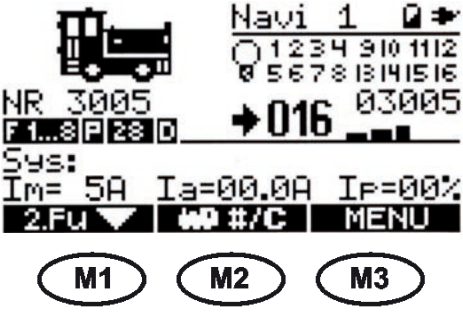


I = International symbol for electric current
I m = maximum current limit in amperes (for PIKO digital command control 5A)
I a = current power consumption in amperes
I p = workload in %

The menu bar displays the current configuration of the 3 key M1, M2, M3.

2.3.2 Menu keys M

The menu keys M1, M2, M3 of the handheld controller are configured differently depending upon the requisite menu functions. The corresponding function key assignments for the menu keys are always located in the lowest line of the display with white lettering on a black background. The following is an example:



2.3.3 STOP keys B + C

The PIKO Navigator has two separate STOP keys. In this way, two different stop functions can be initiated independently of one another as needed during operation, including a general EMERGENCY STOP or a simple STOP LOCOMOTIVE. The configuration of the STOP function is performed in the menu of the PIKO Navigator (Chapter 5.4.2). In the factory default settings, the EMERGENCY STOP is initiated using the right STOP key B. That means that current to the tracks is immediately shut off. The EMERGENCY STOP can then be recalled with the left STOP key C.

2.3.4 Control of primary functions

The primary control functions of the PIKO Navigator are carried out using the round control dial (depicted as D in the drawing). The direction and speed of the locomotive or locomotive consist are predefined using the regulator.

2.3.5 Controll of secondary functions E

The handheld controller's second control function is controlled with the three keys underneath the round control knob D. A second locomotive along with electromagnetic articles can be controlled and switched parallel to the first function.

2.3.6 Keyboard G

Up through 99 functions can be immediately processed simultaneously via the keyboard on the PIKO Navigator. The F key F is used to switch between the control levels.

2.3.7 Light function H

This key H switches the light function of the locomotive currently being controlled on and off. The light function is treated as separate from functions F1 to F16 and therefore is treated separately.

2.3.8 Locomotive selection keys I or M2

Pressing key I or M2 brings you to the locomotive selection menu of the handheld controller. There are various ways to select a locomotive. Information concerning this is presented in chapter 4.1.7.

2.3.9 Function levels / ON - OFF F

The F key F is used to determine the function level of the keyboard. The current setting is displayed beneath the locomotive name. Functions F1 to F8 are initiated by selecting F1...8 via the keyboard. In the second function level, functions F9 to F16 are initiated by selecting F1...16, next follows function level F17 to 20 / Binary State Bereich and F21 to F28.
Pressing the F key F again brings you back to the first level F1...8. Likewise, the keyboard can be switched from the secondary functions to the primary functions. If you are operating the PIKO Navigator in radio operation, it can be switched on and off by pressing the key F.

2.3.10 Binary State Functions

In order to operate Binary State Functions from 30-99 the special mode A3 needs to be activated. The Binary State functions may be entered on the function address screen F17-F20. Start the input with 0 (zero). In order to send a deactivation command a second 0 (zero) is required (screen shows o instead of x). Then enter the function address with 2 digits (30-99). The command is sent immediately.

3. First steps towards vehicle operation.

The steps towards initial vehicle operation with the PIKO Navigator are very simple and can be carried out without any specialized knowledge. The set-up and control of a locomotive are explained in detail below.

3.1 Switching On and Off

The navigator starts automatically when a cable is connected.
In the case of radio operation, the navigator is powered up using the F key.
Pressing the F key for a longer period of time (>1 sec.) shuts the Navigator off.
Please note that radio operation is only possible with inserted batteries (3 x size AA). A radio range of 50 to 100 metres is possible outdoors without any problems. In rooms, the range can be limited by different building materials. Note that Interference with the system from other wireless components, such as wireless computer mice, or keyboards, garage door openers and radio links for audio transmission (audio headphones) in general are possible. This can affect the performance and range of the radio signal or completely make it impossible. Changing channels may improve operation.

If several radio navigators are operated simultaneously, they must be assigned different ID numbers. If an ID is used more than once, the radio operation is disturbed, or strange behaviour occurs. Please read the instructions for the one-time adjustment of radio receiver and navigator in the Section 6.5.3 (p.69)

3.2 Selecting the locomotive address

The locomotive selection key I or M2 brings you to the input window for the locomotive addresses. By entering a locomotive address via the keyboard, for example the locomotive address, 0003 and confirming that address with the M3 key, the desired locomotive is ready for quick vehicle operation. The Navigator subsequently returns to Driving Mode. You can obtain the locomotive address in the instruction manual that came with your locomotive

3.3 First Test Run

After entering the locomotive address and confirming it using M3 , the locomotive can be controlled using the control dial. The first vehicle operation is immediately possible. The locomotive receives its movement data with 28 speed steps and parallel operational data. Detailed function specifications, locomotive image, locomotive name, etc. are defined in LOCOMOTIVE CONFIGURATION.

NOTE: Please note that the light will not function correctly on locomotives that have 14 configured speed steps if they are operated using 28 speed steps. The same is true for locomotives that are configured to 28 speed steps that are then operated using 14 speed steps.

4. Locomotive configuration

4.1 Access to locomotive configuration

You determine your locomotive's range of functions during locomotive configuration. This includes, for example, the number of speed steps, the mode of operation, serial or parallel data processing or the locomotive image.

Locomotive configuration is accessed by pressing and holding the M2 key.

4.1.1 Delete locomotives

It is possible to delete unwanted locomotives in the first configuration window. The currently selected locomotive is deleted by pressing M1.

4.1.2 Speed step configuration

After you have called up locomotive configuration, you will find yourself in speed step configuration. Use M2 to choose between 14D, 28D, 128D and 14M speed steps. D represents DCC operation and M represents Motorola operation. Finally, confirm your selection using M3

In the case of MZS III, only 14+28 speed steps are possible.

4.1.3 Operational Data Mode

By selecting operational data transfer, it is possible to toggle between parallel transfer P and serial transfer S using the M2 key. Conform your selection using M3 if you do not wish to also configure the F key (see **4.1.4**). The type of operational data transfer needed can be found in the description of your decoder or locomotive.

4.1.4 F-key configuration

This enables you to configure keys 1-8 on the Navigator for momentary or continuous operation. This means that if numbers 1-8 are not inverted in the display, the keys will continue to function as before (pressing x 1 correlates with switching on or off x 1 x). By pressing the appropriate key, this figure will be displayed as inverted (figures 2 and 6). This key is now in Continuous Operation Mode. As long as the key is held, the function that is programmed on it will be evoked. Conform your selection using M3.

4.1.5 Selecting the locomotive image

You can select the appropriate locomotive symbol from those that are available using the M1 and M2 keys. It addition, it is possible to select the locomotive image directly using the number keys. The available locomotive symbols can be found in the appendix to this instruction manual in chapter 7. Confirm your selection with M3.

4.1.6 Naming a locomotive

Here you define your personally preferred locomotive designation, which will be displayed below the locomotive symbol during vehicle operation. The locomotive name will also be displayed when using the second locomotive driving function. In that case, the locomotive name appears beneath the locomotive address.

Use the M1 and M2 keys to move between available characters and select the appropriate letters or desired characters. The following characters are available when designating a personal locomotive name:

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	-	/	_	

Once you have selected a character, you move using to the right using the right key of the second function .

The next character can now be defined in this new location. Continue this process until you have completed the designated name. The locomotive designation can have up to 10 characters. For

example: **V 51** or: **V 51 HANSI**, as a designation for **V 51** belonging to model train companion Hansi. The endpoint of the character string is designated using the round STOP key of the second locomotive function. Should you wish to remove **HANSI** from the designation **V 51 HANSI**, it is sufficient to place an endpoint once after **V 51** in the character string. Once you confirm the change with OK, the change to the locomotive designation is accepted and will be displayed correctly as **V 51** the next time the configuration or Driving Mode is loaded. The name is only stored locally in that Navigator. In this way, the personally desired name can be stored for every train on each Navigator.

4.1.7 Store configuration

This is where you store the configuration for your locomotive. **The data is permanently accepted using** M2 **and will still be available the next time you connect to the command control**. If, on the other hand, you only save the data using M3, the data for this locomotive will only be available during that particular play session. If the command control is switched on again later on, these data will no longer be available. Once the data for the locomotive have been saved, you will be returned to Driving Mode.

4.1.8 Defining additional locomotives

To set up a locomotive, proceed as described in chapter 3.

4.1.9 Loading a locomotive

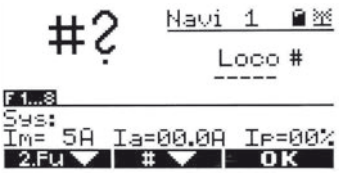
Locomotives that have already been defined are stored in the command control and in the Navigator and can be loaded in Locomotive Selection Mode. There are two ways of achieving this. When entering the address (M2, Addresse) using the keypad, the locomotive address, and therefore the address of the decoder is entered and M3 loaded as well.

In Driving Mode the selected locomotive address is now available. If the locomotive address that is entered is not defined, the result is a first vehicle operation for new locomotives with undefined locomotive characteristics.

A second way of selecting a configured locomotive from a set of locomotives that have already been defined and saved is to use the M2 key. This key allows you to page through each locomotive individually. The selection is then confirmed using the M3 key to return to Driving Mode if you have not entered a new address or selected a new locomotive.

4.1.10 Logging off of a locomotive

A locomotive that has been logged in on a PIKO Navigator is reserved and cannot be acquired by another participant until that locomotive has been explicitly released. This can be achieved by simply opening the locomotive selection menu (using the M2 or 0# key). In so doing, the locomotive being controlled is automatically logged off.



NOTE:
Locomotives are managed via the digital command control. If you select one of the available locomotives, it will be marked as occupied and cannot be claimed by other participants.
This is not dependent upon the operating condition of the locomotive. A running locomotive is always passively logged out since it must continue to receive data from the digital command control. The locomotive is therefore only logged off at the control bus and can be loaded by other participants. If you log off of a locomotive that is standing still, on the other hand, it will be actively logged off. This means that it will also be logged off in the command control and is no longer active. An active logout accelerates data transfer on the track.

4.1.11 Taking control of a locomotive after changing locomotives

If, during play, you switch to a locomotive that is already running on the track, you will need to take control the locomotive at its actual speed in order to be able to control it. After loading the locomotive, the current driving speed (speed step) as well as the current direction of travel will be shown in the display. To take control of the locomotive, turn the control knob in the direction of travel until the number of speed steps changes. The locomotive is thereby taken over and can immediately be controlled.

4.1.12 Loading an engaged locomotive

Locomotives that are already engaged by you or another participant cannot be reloaded in factory settings. The locomotive can only be loaded after it has been released by the participant controlling it. A locomotive can be released by opening the Locomotive Selection Mode 0# or M2 on the appropriate function level, independent of whether the locomotive is running or standing.
In point 6.4.6 Special modes you have the opportunity to configure this take over function (take over of engaged locos).

4.1.13 Analog locomotive

It is of course possible to control an analog locomotive with the PIKO Navigator. The address of an analog locomotive is “0”. It is not possible to define the locomotive characteristics such as speed steps or functions for an analog locomotive. In this instance, locomotive configuration cannot be carried out. An analog locomotive will be depicted as an analog throttle in the display.

NOTE: A high frequency whistle generated by analog locomotives on a digital track is caused by a particular form of digital tension. Extended operation is not recommended. A change of lights is generally not possible. (Refer to the manufacturer’s instructions.)

4.2 Vehicle operation

As usual, control your locomotive in Vehicle Operation Mode using the transparent control dial. The locomotive comes to a standstill when the control dial is it the middle position. Speed level **000** will be shown in the display. The locomotive's direction of travel is indicated by an arrow in front of the speed step figure.

4.2.1 Functions for vehicle operation

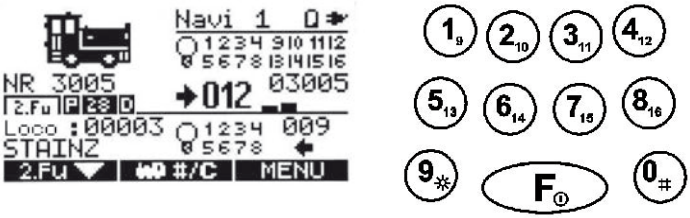
Functions are initiated using function keys 1 through 8. If the locomotive is receiving parallel data, the function will light up once in the display. If, in the other hand, the locomotive is receiving serial data, the function F1 will blink multiple times.

Using the F key, you can switch the function level from functions 1 through 8 to functions 9 through 16. The function keys are returned to functions 1 through 8 by pressing the F key again.

Functions 9 – 16 , F17...F20 and F21...F28.

At the function level F17...F20 the Binary States 30-99 are available

Functions F1 to F16 are depicted on the function keys.

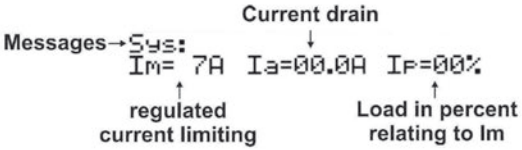


5. Secondary Function

In addition to the primary function, locomotive control, the PIKO Navigator a secondary control for additional functions. Thus it is possible to control a locomotive using the control dial while simultaneously engaging switches or routes or even controlling a second locomotive.

5.1 Info Mode

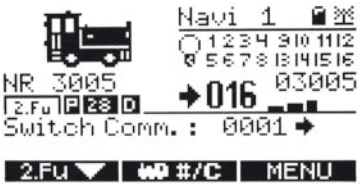
When the PIKO Navigator is started, the Information Mode for the secondary function is loaded. This always indicates the maximum traction current, the current power usage in amperes and as a percentage. In addition, system messages are issued.



The secondary function on the PIKO Navigator can always be selected using the M1 key. The first time the key is depressed, the keypad (keys 0 through 9) is shifted for the input of the second function. This is clearly visible beneath the locomotive name. The display changes from **F1**.through.**8** to **2**nd function. A locomotive can then be controlled as usual however no more functions can be engaged. Repeated pressing of the key switches the second function. They keypad can be restored to the primary functions by pressing the F key.

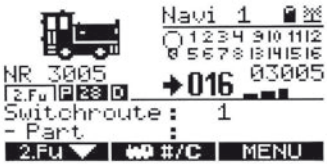
5.2 Switch commands

You can change to the Switch Commands Mode by repeatedly pressing the M1 key. Enter the address of the switch via the keypad on the PIKO Navigator and throw it to the left or right using the arrow key on the 2nd function . In addition, you can use the round STOP key dto leaf through the last 8 switches that have been thrown. If you have already thrown switches **#0001** and **#0006**, you can jump back to switch **#0001** using the round key, then proceed back to switch **#0006**. This also works if the keypad has been returned to primary functions (using the F key). This allows you the entire range of locomotive control while throwing the last 8 switches.



5.3 Changing routes

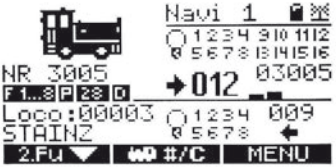
In addition to throwing a single switch, it is also possible to change the entire route. These routes must be defined in advance as described in chapter 6.3.1. Press the M1 key until the display shows the secondary function field for routes. Enter the route address via the keypad and engage the route using the right-arrow key . All elements of the route then receive the previously defined switch command in sequence. As was the case with functions that throw switches, the last eight selected routes can be recalled, one after the other, using the STOP key and engaged



5.4 Second locomotive

The PIKO Navigator as a handheld controller offers the possibility of controlling two locomotives or trains concurrent to and independent of one another. In order to access this operational mode, press M1 until the indicator in the secondary function field displays **locomotive: XXX**. Enter the locomotive address using the keypad and then confirm your selection using the right key of the second function . It is only possible to load configured and saved locomotives using the second locomotive function. It is not possible to enter a new, unknown locomotive.

If the locomotive address has been correctly selected, the data associated with the locomotive will be shown in the display. Those data include: locomotive address, locomotive name (if assigned), light, functions 1 through 8 and of course the direction of travel and the speed step.



You can control the second locomotive using the arrow keys . The round STOP key automatically sets the locomotive to speed step 0 and stops the locomotive. When it is at a still stand, it is possible to change the direction of the locomotive. You can also switch locomotives at this point by using the 0# key. Functions 1 through 8 can be engaged for the second locomotive being controlled. Switch the function key configuration using M1 to the configuration for the secondary functions.

6. Device setup

The device setup of the handheld controller as well as various system configurations can be performed in the Navigator's menu. Use the M3 key to exit vehicle operation and access the main menu.

The principal underlying the menus is universal. M1 is used for navigation, M2 is used to confirm a selection and M3 returns you to vehicle operation. You can change the selection using M1 until you reach the desired menu item and then conform your selection using M2.

6.1 Locomotive consist

In a locomotive consist, multiple locomotives are coupled together in a single train. This is familiar in the long freight trains in the USA, for example.

In order to use a locomotive consist, it must first be defined. The method for doing so is presented in 6.3.2.

NOTE: When putting a locomotive consist together it is absolutely necessary that all locomotives be set up with the same characteristics in the locomotive configuration feature. This means that **all locomotives must be programmed with the same speed step number and in parallel**. The consist cannot be set up and will be cancelled if this is not the case

MORE INFORMATION CONCERNING THIS IN CHAPTER 6.3.2

If the locomotive consist is configured as described in chapter 6.3.2, they can be selected here. By default, locomotive consist No. 1 will be loaded. You can leaf through previously set-up consists using M2 Once you have found the desired consist, you can select it using M3 .

You can enter Locomotive Consist Mode through menu M3 and M2. In Locomotive Consist Mode, the addresses of up to 4 locomotive consists are displayed instead of the locomotive symbols. Locomotive consists are controlled in a manner comparable to controlling a single locomotive.
If a locomotive address that has not been configured is found in the selected consist, this will be indicated with an X after the address. The same applies if one of these locomotives has been engaged by another user.

Should this occur, select a different consist using M2 or exit consist mode using M3 and M2.
The primary function of the Navigator can be toggled between controlling a locomotive or a locomotive consist. The first entry in the menu will no longer be the option **locomotive consist**, but rather **drive locomotive**. In this manner, you are returned to the normal locomotive mode.

6.2 Decoder programming

The Navigator supports all of the usual programming methods that are standard to NMRA/DCC. Please be aware when programming the decoder that not all of the programming variants listed will be supported by every digital system. The instruction manual for your digital system should provide detailed information concerning this. Select the programming variant that is appropriate for your digital system. A connected decoder will acknowledge every successfully executed program command with a short current pulse (motor jolt). For this to occur, a motor must be connected. (In the case of switch decoders, a railway switch drive should be connected for this purpose). In this way you will always be ensured that program commands are being received and executed correctly.

6.2.1 Loco address

This is where you can read and program in the locomotive address for your locomotive. The address can be selected from 1-1-10239. The Navigator automatically calculates the appropriate programming values for CV 1, 17 and 18+29. In addition, you can also indicate whether the decoder should be operated with 14 or 28 speed steps or set the driving direction and block the analog operation.

6.2.2 CV readout and CV programming

CV readout

The decoder readout is not a programming variant however it is indispensible for monitoring programmed settings. The Navigator supports this readout procedure. In so doing, individual settings can easily be checked. The CV (configuration variable) to be read is entered into the Navigator and can been read out with M1 .

CV programming

CV programming is the simplest and most highly preferred programming variant today and it is supported by nearly all digital systems. During the programming procedure, the CV being programmed and the programming value are retrieved and with M2 programmed. Depending upon the digital system, programming takes place on a separate programming track or on the rail track that is being used as a programming track. (You can find details regarding this in the instructions for your digital command control).

Note: The driving track and the programming track are identical on the PIKO digital control unit. When programming, no other vehicles may be placed on the system, otherwise they will be influenced.

6.2.3 Writing bit by bit to CV (informatively)

Some CVs are made up of so-called binary values. This means that multiple settings are combined in a single value. Each function has a bit location and a value. If such a CV is to be programmed, all values must be added. A disabled function always has a value of 0 and active function will have the value indicated in the table. Add all active values and program the result into the CV. The Navigator automatically shows the bit conditions in the lowest row of the display for control.

6.2.4 Switch / decoder programming

Programming a switch decoder is done as follows. Connect the switch decoder to the programming track and close the programming bridge or delete the programming lock as described in the decoder's instruction manual. In addition, a switch must be connected as a load, because otherwise feedback in the Navigator will not work. Use M3 to navigate to the main menu and select Decoder Programming. Switch to CV Programming (in older LGB® decoders, you will have to use register programming). Enter 1 as a CV value, and then under value, enter the desired switch decoder address. As an example, if you were programming the address 20, you would have 17 = first exit, 18 = second exit, 19 = third exit and 20 = fourth exit.

6.2.5 PoM - Program on Main Track

The PoM programming method is the only process to directly program operations on the rail track. All CVs in the decoder except CV 1 can be programmed using the PoM programming method.
Only use PoM programming then the locomotive is at a standstill.
Program your decoder using the menu decoder programming menu items in the PIKO Navigator. Here you can program and read CVs (configuration variables), locomotive addresses, as well as carry out PoM- and register programming.

In the first step, you define the kind of programming command. Use the M1 key to select the type of programming desired. Confirm your selection with M2. The arrow will then jump to the next position. Now enter the CV-Address for the CV being programmed and conform this again using M2. Use the M2 fkey to perform the programming. You can subsequently leave the programming using the M3 key.

NOTE: The PIKO digital command station does the programming via the track output. Therefore we suggest to install an isolated track-section for the programming. Otherwise, all locos that are on the track will be influenced during programming. With PoM (programming on main) only the activated loco will be programmed. Programming was tested with decoders from the following manufactures: Massoth, LGB®, Lenz®, Zimo®, Esu®, and Uhlenbrock®.

6.2.6. PoM Switch Address

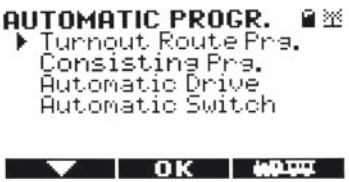
With this feature the latest state-of-art switch decoders may be programmed.
Please refer to the manual in order to find out if PoM is supported.

6.2.7 Register programming / Writing indirectly to CV

Register programming was the first programming variant to be used to set up the decoder's characteristics. We continue to support this process in the interest of compatibility with older command controls and programming devices. The CV being programmed and the value are thereby stored in auxiliary variables. The decoder subsequently programs the data into the appropriate CV itself. The appropriate values are entered into register 6 and register 5 using the Navigator. CVs 1 through 4 are thereby programmed directly while all higher CVs are programmed via register programming.

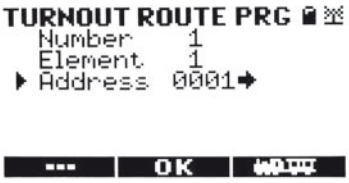
6.3 Automated programming

This allows you to program various automated functions such as routes and consists.



6.3.1 Route programming

This is where routes are programmed. Up to 16 routes can be configured. First enter the route number that you will later use to recall the route and then confirm it using M2. Up to 15 elements can be configured into a route. The PIKO Navigator automatically counts the elements in ascending order. Simply enter the address of the first element and define the direction in which the switch is thrown using the arrow key ◀ or ▶. Then confirm the choice using M2. The next element ion the route can now be defined.



If you release the address of an element and confirm this using M3, the end of the route is recognized and the Navigator returns to vehicle operation. The route is configured and can be toggled.

If you want to modify a route and, for example, delete the third element, reload the configuration and use M2 to conform all of the correct elements. Terminate the configuration of the third element using M3. Do not confirm the third element using M2. The third element and all subsequent elements in the route will be deleted automatically.

6.3.2 Locomotive consist programming

In the locomotive consist option you can control up to 4 locomotives in a single consist. Up to 16 locomotive consists are possible. The first step is to enter the number of locomotive consist. It is subsequently possible to enter the addresses of the first through the third locomotive. Conform the locomotive address using the M2 key and then enter the address of the next locomotive in the locomotive consist. Use M3 to exit the consist menu. As with route programming, data for the current and the subsequent locations are deleted when you leave the configuration mode using the M3.

6.4 Navigator configuration

In the Navigator configuration menu, you can implement specific settings for the PIKO Navigator. It is here that you switch the lighting on and off, define the Emergency Stop Mode, select the preferred language, manually program the ID number for your Navigator, lock the Navigator against modifications and, in the advanced configuration mode, where you can restore the device's factory settings.

6.4.1 Lighting

Use this menu item to control the lighting on the PIKO Navigator.
The following settings are possible using the M2 key:
0 = Lighting off
1 = Display illuminated
2 = Display illuminated
3 = Display dimmed by 50%

We suggest turning off or dimming the lighting during radio operation in which there is adequate light. This will extend the life of your battery and therefore extend the length of your play session using the Navigator for radio control.

6.4.2 Emergency Stop Mode

Use this menu item to select the preferred Emergency Stop Mode, for example, depending upon whether you are left- or right-handed. You define the key to be used to initiate an EMERGENCY STOP using LEFT or RIGHT. You can reinitiate an EMERGENCY STOP using the second STOP key. The RESET option allows the transmission of an additional STOP command. All locomotives are stopped however the voltage is not switched off

NOTE: If you choose the RIGHT option, for example, you will initiate the EMERGENCY STOP using the right STOP key. If you have initiated an EMERGENCY STOP, both STOP keys on the Navigator will be blinking red. The voltage on the track will be shut off. You can use the left button to cancel the EMERGENCY STOP. If you choose the option RIGHT + RESET, you can send an additional RESET command with the left key in addition to the EMERGENCY STOP. Once you have initiated a RESET, both STOP keys on Navigators will light up continuously as red. All locomotives will remain at a standstill. The voltage to the track remains on, however. You can then cancel the RESET command with the left key.

In addition, after a RESET command has been issued, you can initiate an EMERGENCY STOP using the defined EMERGENCY STOP key.

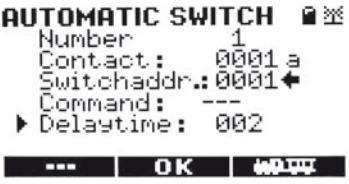
IMPORTANT: It is possible that, depending on their generation, some decoders will not understand this RESET command. In that case, the decoder will not shut off.

6.4.3 Select language

Select this menu item when you wish to operate the PIKO Navigator in a different menu-language. The languages that are available are dependent upon the uploaded language data that can be installed during the software update (chapter 8).

There are 2 kinds of language data:
400H-xx1.dimax = primary language data
400H-xx2.dimax = secondary language data
You can put together your language package yourself.

6.4.4 ID number programming



It is possible to manually set the device ID. The IDs for the bus devices are always automatically allocated in the log during cable operation. This ensures that there is no double allocation of an ID which could lead to a collision among participants. Nevertheless it is possible to manually set the IDs. The radio ID must be set manually.
The IDs for cable operation and radio operation are independent of one another and can be entered here. After entering the IDs and conforming them using M2, the navigator restarts.

6.4.5 Locks

This function can be used to activate a kind of child-safety device. After entering a four-digit numeric code and confirming it using M2, only the following functions remain available:

- Control dial
- M1 key (activation of the Navigator with code entry)
- keys1-9
- F-key

You can deactivate this function again using the M1 key and entering your four-digit numeric code and then using the M1 key.

NOTE: Should you ever lose your activation code, contact us by Email (hotline@piko.de) with your Navigator's serial code. This can be located in two places. When switching on your Navigators, press and hold the F key. The serial number will be visible on the left. Alternately, look at the sticker in the battery compartment. In our example, the number is 0170.

We will then promptly send you an unlock code.

6.4.6 Special mode

In this menu the special modes and functions can be activated or deactivated.

A		OFF (Normal)	ON
1	Operating function of the wheel knob	Backw. - Stop - Forw.	Incremental (Trolley)
2	Take over assigned locos (only main function display) Not to be used with XpressNet and LocoNet!	No	Yes
3	Higher loco functions available	only 1...16	additional 17...28+BS also 17...28+BS

B		OFF (Normal)	ON
1	Switching history (Switches and Switching routes)	8	16
2	Number of switch routes available / programmable	16 (x15)	32 (x7)
3	Show feedback contact information	No	Yes
4	Standard Switching commands or inverted (LGB Mode)	standard	LGB-Mode
8	Detection and Error messages R/C Receiver	Off	On

6.4.7 Factory settings

In order to access this menu, first select more using **more** with M2 .

Only confirm the restoration of factory settings on the PIKO Navigator if you are absolutely certain that you want that. Otherwise you can navigate away from this menu using M3 . If you restore factory settings, all configured entries in the navigator will be deleted.

The PIKO Navigator will be returned to its factory default settings.
All programmable entries (e.g. locomotives, routes, consists, switches…) must be reentered. The Navigator will subsequently restart.

6.4.8 Sort the Loco Database

The loco database may be sorted by 3 different criteria:
• Loco address
• picture number
• individually assigned name
When sorting the database by loco names we recommend to name the locos with the train line first.
For example:
• Taurus BR 182 or
• BR 80
After selecting the preferred sorting function with M1 the process itself is started with M2.
This may take up to 40 seconds. **While sorting the database it must not be turned off.**

6.5 Radio transmitter

6.5.1 Radio transmitter configuration

The radio transmission configuration option on the PIKO Navigator has been unlocked .
The hitherto inactive menu item, **RADIO TRANMITTER CONFIG** can now be accessed.

6.5.1.1 Shut down time

The shut down time determines the length of time for which the radio connection to the wireless receiver is maintained until the navigator automatically logs of when there has been no input. When shutting down or in the event of a loss of signal, all allocated locomotives are automatically logged off. The same is true of the wireless receiver is cut off.

6.5.2 Battery charge function

You can activate the battery charge function using M2. The charge function depends upon the battery voltage. Batteries can be charged during cable operation.

Battery charge off

Battery charge on

IMPORTANT NOTE: only activate the charge function on the Navigator if rechargeable batteries have been installed. Non-rechargeable batteries may not be recharged under any circumstances. This will destroy the battery. There is a risk of explosion!

The battery symbol displays the charge left on a battery.

 = battery is dead

 = battery is at 1/3 charge

 = battery is at 2/3 charge

 = battery is fully charged

If the inside portion of the battery symbol is blinking, the battery is being charged.

6.5.3 LogIn 2,4 GHz

• LogIn 2,4 (radio connection 2.4 GHz)
In the 2,4 GHz radio system, the navigators must be registered with the radio receiver (pairing).

Use the M2 key to select the login procedure:

• **STD** = Standard: Normal login
• **PRI** = Priority: Priority application (see recipient 2.4 GHz documentation)
• **DIR** = Direct radio: Special direct radio procedure (see receiver 2.4 GHz documentation)

With the round button under the knob the login is started (=>). On the receiver, the registration must now also be authorised (see receiver 2.4 GHz documentation). Wait until the registration has been confirmed (√).

6.6 Command Control Configuration

This function is reserved for future application.

7. Software update

In the future, PIKO will offer updates at irregular time intervals, which we will announce on our homepage www.piko.de . A software update can be done in our factory or by authorized dealers. Furthermore, the latest firmware can be updated via the bus connection via PC module*.

* Massoth accessories and separate power supply required.

8. Technical data

The PIKO Navigator is a controller for model railroad layouts. For operation, please note the following:

Cable operation:

Maximum voltage range	max 24 V
Minimum voltage range	min 10 V
Current consumption	max 80 mA
Operation using the following digital command controls allowed starting with firmware version V2.0	PIKO 35010 DiMAX 1200Z, DiMAX 1210Z, DiMAX 800Z, MZS III

Radio operation:

Maximum voltage range	3 x Battery 1,5 Volt Type: AA 3 x Battery 1,2 Volt Type: AA NiMH or NiCd
Minimum voltage range	min ± 3,1 V
Current consumption	max 80 mA
Radio operation only using PIKO Wireless Receiver (FM)	35018

9. Glossary

- **Bit**
  A bit is the smallest unit of information in the digital world. It can be either 1 (set) or 0 (not set). 8 bits comprise a byte.
- **Booster**
  Power amplifier in a digital system used to generate additional current.
- **Bus / Bus system**
  A bus system constitutes an electrical connection between control components of a digital system. The different bus systems used in model train digital technology are generally not compatible with one another.
- **Byte**
  In the digital world, 8 bits make up a byte. A byte can be expressed as a decimal value that falls between 0 and 255.
- **Command control**
  The command control is understood as the “brain” if the digital system. All requests, feedback etc. come together here to be processed. In addition, the command control generates the digital track signal, which is frequently immediately amplified by an integrated booster and/or passed to a booster for amplification.
- **CV - Configuration variable**
  On DCC decoders, various settings can be stored in so-called CVs. A CV consists of a byte (= 8 Bit) and therefore can have a value of 0 through 255.
- **CV programming, direct CV programming, direct mode (DM)**
  The so-called CVs can be modified by means of CV programming. In so doing, a distinction is made between bitwise programming (only one of 8 available bits is modified) and byte-wise programming (the entire byte – thus all 8 bits – are used). CVs can also be read using this system.
- **DCC**
  DCC is the abbreviation for Digital Command Control and is a standardized model railroad digital system. An additional system would be Motorola, for example. Command Control and decoder must utilize the same system.
- **Decoder**
  A decoder (switch decoder, locomotive decoder) appropriately converts commands sent from the command control (e.g. Control motor).
- **Digital system**
  Electronic multi-train travel system. In addition to actual traction current, digital technology can be used to issue commands via the rails such as travel speed, braking deceleration as well as functions such as switching lights on and off. Each vehicle requires a digital address in order for this to occur. The vehicles must be equipped with a so-called digital decoder. There are different protocols which cannot be used in conjunction with one another. In this way, multiple locomotives can travel on the same track independent of one another.

- **Digital address**
  In order to access individual vehicles or components such as switches with a digital system, each of these objects requires a unique, numeric address. Depending upon the digital system, a greater or lesser number of addresses can be invoked.
- **Interface**
  An Interface generally establishes a connection between the digital system and a computer. If a computer is to take over control tasks on a system, the interface is absolutely necessary in order to be able to control individual modules. An interface is already integrated into many digital command controls.
- **MOROP**
  MOROP is the European Union of Model Railroad and Railroad Friends, founded in 1954 as "European Union of Model Railroads". The headquarters is in Bern. The goal of the organization is, among other things, to establish the Normal European Modeling Standards (NEM). A "Technical Committee" was formed for this purpose that adapts this regulatory work to developments in the model railroad sector through amendments and reworking of the associated norms.
- **MZS (multi-course system)**
  MZS is the designation for the LGB digital system. This is based on DCC fundamentals of the NMRA.
- **NEM (Normal European Modeling Standards)**
  The MOROP develops these norms which are supposed to lead to the standardization of model railroading. Aspects such as the design of the couplings, the digital decoder hookup etc. are specified in the NEM. The train eras are also specified in the NEM.
- **NMRA (National Model Railroader Association)**
  The American national association of model railroaders. Just like the MOROP in Europe, the NMRA has developed norms that are valid for all American model railroaders. They are also responsible for norms governing DCC systems.
- **PoM (Programming on the Main)**
  PoM designates a new kind of locomotive decoder programming on the main track during operation.
- **Protocol**
  A protocol determines how, in what form and in what order the data is transferred.
- **Speed steps**
  The maximum engine power us subdivide into speed steps. Each speed step can be accessed individually. The more speed steps that are possible, the finer the control over the vehicle speed.

10. Warnings

- The PIKO Navigator is only suited for the operation of model railroad layouts with the specified control components.
- The PIKO Navigator can and may only be operated with the components described in this instruction manual. An alternative use is not permissible.
- Only connect the PIKO Navigator to the equipment described in this instruction manual. Even if other pieces of equipment use the same connectors, operation using that equipment is not possible. This will lead to damage to the PIKO Navigator as well as other components.
- Please ensure that the PIKO Navigator is not dropped or allowed to fall. Do not subject it to blows or jostling. This can lead to damage of the equipment.
- Do not expose the PIKO Navigator to a direct heat source, direct sunlight or moisture. This can affect its functioning.
- Never open the PIKO Navigator, as this can damage or negatively impact the equipment.
- Never clean the PIKO Navigator with harsh cleaners, cleaning solvents or corrosive chemicals.
- This product is not a toy. This product is not appropriate for children under the age of 14.
- For function-related or manufacturing-related reasons, this product may have sharp edges. As a result of the function-related construction, there is a risk of being bruised or stuck.
- There is a choking risk associated with small parts. Please do not allow children or untrained persons near the equipment. There is a risk of injury if improperly used or operated.
- Only operate this equipment with those pieces of equipment specified in the instruction manual. Electrical and mechanical measurements as well as images are without guarantee.
- Errors excepted! Data can be changed without prior notice.
- There are no warranty claims for damages that result from improper handling or unauthorized interference. Contraventions shall lead to immediate loss of guarantee and a general refusal of repair.
- Justified complaints will be remedied at no cost. For repairs or service, please bring your product to a specialist retailer or send it to the manufacturer with adequate postage. Goods returned freight forward will not be accepted..

11. Warranty

Upon purchase of a PIKO product the firm of PIKO Spielwaren GmbH gives you **a Manufacturer's warranty of 24 months** from the date of purchase in addition to and beyond the warranty performance rights available to you legally in your country vis-à-vis your authorized PIKO dealer as the contractual selling party. This warranty is given with the following conditions listed below. Regardless of where you purchased the product, you thereby have the possibility of submitting for warranty claim defects or flaws occurring with the product to the firm of PIKO as the manufacturer of the product.

Warranty Conditions

This warranty applies to PIKO products and spare parts that have been purchased from any of our worldwide authorized PIKO dealers. The sales receipt will serve as proof of purchase.

Warranty Coverage / Exclusions

This warranty includes, at the discretion of the manufacturer, correction free of charge of any defects or the replacement free of charge of damaged parts that are due to defects in design, production, material or transportation inclusive of the service performance connected with these defects. Any further claims are excluded.

Warranty claims become null and void

- when the defects are caused by wear and tear or by normal wear of parts subject to wear and tear.
- when PIKO products have been converted with parts not authorized by the manufacturer.
- when the installation of specific electronic elements has been carried out by parties not authorized by the manufacturer for such an installation.
- when the product has been used in a manner not intended by the manufacturer.
- when the information in the operating instructions provided by the manufacturer has not been followed.

Repair or replacement of a product does not extend its warranty period. Warranty claims can be submitted directly to the seller, or the part to be submitted for warranty can be sent directly to the firm of PIKO along with sales receipt and a summery of the problem(s) with the product. Shipments have to be prepaid.

12. Hotline

For technical support contact:
PIKO Hotline:
Tuesday, Thursday: 4:00 – 6:00 p.m.
Phone: +49 (0)3675-897242 · hotline@piko.de

* Massoth, LGB®, Lenz®, Zimo®, Esu® und Uhlenbrock® are the property of their owners. All information subject to alteration.

REGULATORY INFORMATION:

1. FCC Information (USA):
This device contains FCC ID: WAP4110.
The device CYBLE-224110-00 complies with Part 15 of the FCC Rules. The device meets the requirements for the modular transmitter approval as detailed in FCC public Notice DA00-1407. Transmitter Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

2. ISED Information (Canada):
This device contains IC: 7922A-4110.
The device CYBLE-224110-00 including the built-in chip antenna complies with Canada RSS-GEN Rules. The device meets the requirements for modular transmitter approval as detailed in RSS-GEN. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

L'appareil CYBLE-224110-00, y compris l'antenne intégrée, est conforme aux Règles RSS-GEN de Canada. L'appareil répond aux exigences d'approbation de l'émetteur modulaire tel que décrit dans RSS-GEN. L'opération est soumise aux deux conditions suivantes: (1) Cet appareil ne doit pas causer d'interférences nuisibles, et (2) Cet appareil doit accepter toute interférence reçue, y compris les interférences pouvant entraîner un fonctionnement indésirable.

3. MIC Japan
CYBLE-224110-00 is certified as a module with type certification number 203-JN0568.

4. KC Korea
CYBLE-224110-00 is certified for use in Korea with certificate number MSIP-CRM-Cyp-4110.

PIKO Spielwaren GmbH
Lutherstr. 30
96515 Sonneberg, GERMANY
www.piko.de · hotline@piko.de