The second step in our sequence requires a five second pause to be inserted. To do this, we select the third field with key 3 ...
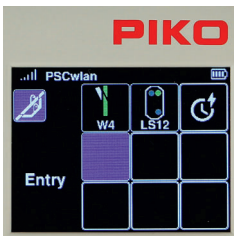

... and in the next window we activate symbol 2 for the pause.

In the subsequent window, you can jump to the delay field and select it with the OK button.

Now we insert a pause time of 50 seconds in 1s increments and confirm it with the OK button.

Then we highlight the "OK" field and complete the entry by pressing the OK button.

The third step of our sequence will now appear where at the end of the route, entry signal LS12 is set to red (Hp0) again.

To do this, we first select the fourth, still empty field with key 4 or with the navigation keys followed by confirmation with the OK button ...

... and in the next window we activate symbol 1 again, for an accessory.
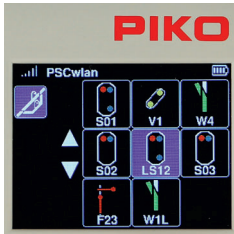
In the selection, we select light signal LS12 using key 6 on the keypad or by using the navigation keys followed by the OK button.

Now we can decide which signal aspect to switch. The signal should be set to "red" (Hp0). To do this, we either use key 1 or the navigation keys to highlight the relevant field and confirm it with the OK button.

We now enter a delay time in 100ms increments and confirm it with the OK button and complete the entire step by highlighting the "OK" field.

The window that now appears displays all the accessory commands of our completed route.

The last step is to press the "back button" to save the new route in the following window via the "save" symbol.

This window also allows us to delete a route (that has been called up in the editing menu) by using the "Recycle bin" icon.

The display will now change to the editor menu for routes. Our new route is displayed and, if desired, we can create another route using the empty field.

Pressing the "Back" button two more times takes us back to the main menu, in which the newly created route can now be selected and tested via the route menu.

3.7. The CV programming menu [CV]

In the main menu, the "CV" icon is selected using key 5 on the keypad.

A CV (Configuration Variable) is a memory address in a digital decoder. The content (value) of these CVs determines the behavior of the decoder. The meanings of the respective CVs are found in the instruction manual of the decoder.

The **PIKO SmartControl**_wlan_ offers three types of programming for decoder CVs:
1. Programming on the Main (POM)
2. Programming on the Main for Experts (XPOM) is a new type of programming for experienced programmers
3. A Programming track (PROG) is the traditional programming method where the locomotive is placed on an isolated track dedicated just to decoder programming.

The fourth menu (PSD) is intended for updating **P**IKO **S**mart**D**ecoder from version XP 5.1 and upwards.

3.7.1 CV programming on the programming track (PROG)

Since programming on a programming track is the most common, it will be explained first.

First place a locomotive with a CV-programmable decoder on the programming track.

In the programming menu, call up the "PROG" menu using button 3 on the keypad or by using navigation buttons and confirm your choice by pressing OK.

The panel's green Run LED will flash and a red "P" will appear in the top line of the next display window.

Use the navigation keys to jump to the "CV" field and enter the CV number to be read or written. To do this, first press the OK button. The input field will now become solid. Now enter the CV number using the keypad and confirm it by pressing the OK button again.

CVs up to 1024 can be edited.

If you want to read the CV, use the "left" navigation button to select the "read out" symbol and confirm it with the OK button.

NOTE: If a message is displayed saying "Prog. Tr. is occupied, please wait.", the programming track is currently being used by another controller and cannot be accessed by this controller.

The read value is now displayed in decimal form in the "Value" field, and as bits highlighted in red in the bit field underneath. The "read out" field is now solid red. The meaning of the CV's individual bits can be found in the instruction manual for the decoder.

If the CV read out failed, the "Value" field will display a 0 and the "Read" field will remain outlined in red.

If this CV is to be programmed with a different value, then select the "Value" field on the right-hand side and confirm with the OK button. Now enter the desired value, confirm with the OK button and select the "write" symbol on the left-hand side. Complete this step by pressing the OK button.

The value to be written can be entered in decimal form in the "Value" field and in bit representation as bits highlighted in red. For bit-by-bit program-ming, use the "down" button to jump into the bit sequence, use the "left" and "right" navigation buttons to select the desired bits and confirm each with the OK butto.

If the CV was written successfully, the "Write" field will now turn solid red.

3.7.2 CV Programming on the Main track (POM)

A prerequisite for main track programming is that the decoder address of the locomotive to be program-med is known. In addition to be programmable on the main track, CVs can also be read from the main track provided the decoder is capable of it.

NOTE: The currently active locomotive can still be operated while it is being programmed on the main track.


Call up the "POM" menu in the programming menu by pressing key 1 or using the navigation keys followed by the OK button.
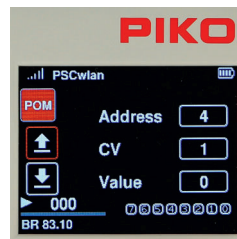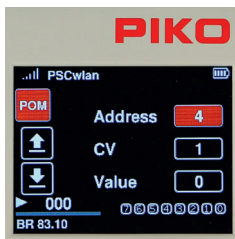
Now go to the "Address" field, press the OK button and enter the decoder address to be edited, using the keypad. Confirm with the OK button.

If the displayed CV is to be read, then use the "left" navigation button to select the "read out" symbol and confirm with the OK button. CVs from 1 to 1024 can be entered into the CV field.
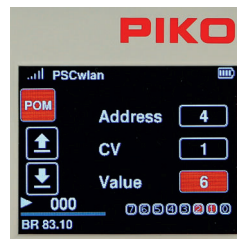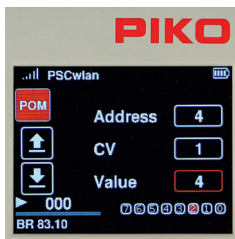
The read value is now displayed in decimal form in the "Value" field and as bits highlighted in red in the bit representation (below).

If the CV value is to be changed, use the navi-gation buttons to navigate to the "Value" field and activate it with the OK button. Enter the new value using the keypad and confirm it with the OK button. You can also change the CV bits in this window (Chap. 3.7.1 " ... programming track (PROG)").

Now use the "left" navigation button to select the "write" symbol on the left-hand side, and finish by pressing the OK button.

Other CVs can be programmed in the same way.

To leave main track programming, press the "back" button. The display will again show the programming menu.

During Programming on the Main track, the input and action fields behave in the same way as they do when programming on the Programming track. If a CV has been successfully read or programmed, the corresponding action field will also be solid red.

3.7.3 CV Programming on the Main track (XPOM) *for Experts*

The **PIKO SmartControl**$_{wlan}$ offers a relatively new type of programming method known as Programming on the Main for Experts (XPOM). This is used to speed up access to CVs and to address the area of the CV banks that can only be accessed via CVs 31 and 32. Up to four CVs can be written with one command. If the decoder is RailCom®-enabled, the system can read four CVs at the same time. This processing is done in decimal or hexadecimal notation·

PLEASE NOTE: CV numbering starts with "0". CV1 is really CV0. CV29 is actually CV28, etc.!
The CV number to be entered is always 1 number less than the value you want to give the CV!

To start the XPOM process, first place a locomotive with a known decoder address on the main track.
In the programming menu, call up the XPOM menu using key 2 or by navigating with the navigation buttons and pressing OK.

Now go to the "Address" field, press the OK button and enter the address of the decoder to be edited using the keypad. Confirm with the OK button.

The line CV basically consists of the values of the "pointer" CVs 31 and 32 (fields 1 and 2) and the actual CV to be edited (field 3). This CV is always between 0 (CV1) and 255 (CV256). If, for example, the decoder instruction manual says "CV31 = 16, CV32 = 0 and CV257 = volume level value" for setting the overall volume, then CV257 is the first CV in this CV bank and is also entered here with CV number 0.

For this example, the values of the three input fields would then be "16, 0, 0"..

If the CVs are to be read from the "CV" line, then use the "left" navigation button to select the "read out" symbol and confirm with the OK button.

The read values of the four CVs are now displayed from left to right in decimal or hexadecimal notation in the "Value" fields in ascending order. Here are the values of CVs 1 - 4.
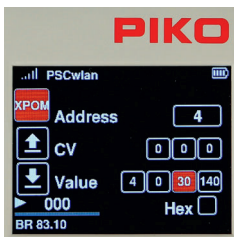
If the values are to be changed, then use the navigation keys to select the desired field and confirm with the OK button. Now enter a new value using the keypad and confirm again with the OK button. Finally, use the "left" navigation button to select the "Write" icon, and confirm by pressing the OK button.
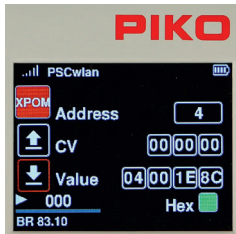
If the display in hexadecimal form is desired, then select the "Hex" field with the navigation keys and activate with the "OK" button. The values greater than 9 (A - F) can be set using the telephone keypad or the "up" and "down" navigation keys and confirmed with the OK button.

To exit the XPOM programming menu, press the "back" button. The display will again show the programming menu.

3.7.4 Update menu for PIKO SmartDecoder XP 5.1 and further versions (PSD)

This menu can be used to update PIKO SmartDecoders beginning with version XP 5.1. The latest firmware can be found in the web shop on the PIKO website and can be copied to the SD card.

To update a decoder it has to be in a locomotive on the main or programming track, or inserted into a PIKO SmartTester that is plugged into the "Extension" port on the side of the **PIKO SmartBox**$_{wlan}$.

After selecting the "PSD" field, the input field for the decoder address and the option for selecting the "track" where the update will occur appear in the next window.

The decoder address can be changed in the "Address" field if necessary. To do this, press the OK button when the address field is highlighted, enter the address, and then confirm with the OK button.

If the locomotive is not on the specified track, the track selection can be changed using the "Track" field. There are two options here which can be selected by using the "up" or "down" button. "PROG" for the programming track output and "MAIN / EXT" for the main track output or the SmartTester connected to the extension port. Locomotives with other decoders can start moving unintentionally due to their automatic analogue detection. When your selection is confirmed with the OK button, the system will search for the decoder and identify it's type. If it is identified, the firmware version suitable for this decoder type will be displayed on the SD card and only then can the update commence. Once the decoder has receives the signal, it activates outputs A0f and A0r.

The update for this PSD decoder starts via the "Update" field by pressing the OK button. Please do not interrupt the update process!

After a successful update, the progress bar will appear solid green and the SmartBox will emit three short beeps. The PSD menu can now be exited using the "back" button.

The CV menu is now displayed again.

3.8. The Settings menu [⚙]

To assign settings in the **PIKO SmartControl**$_{wlan}$ devices, the " ⚙ " icon for the settings menu must called up in the main menu by using key 6 or by the navigation keys followed by pressing the OK button.

The Settings menu gives you options for setting system attributes like language (1), screen brightness (2), and general settings (6) all the way through special settings for the SmartBox (8).

3.8.1 Setting the Language

Currently, nine languages are available, and their respective alphabets are used in their character sets.

To change a language, select the Language icon using key 1 or by navigation and then pressing the OK button.

You can use the "up" or "down" navigation buttons to scroll to the desired language and then select it with the OK button.

To exit the language menu, press the "back" button. The display now returns to the settings menu.

3.8.2 Setting the Controller's display brightness

The Controller's display brightness as well as the keyboard backlight brightness can be set separate from each other.

To do this, press key 2 on the numeric keypad in the settings menu, or navigate to this field and activate the menu with the OK button.
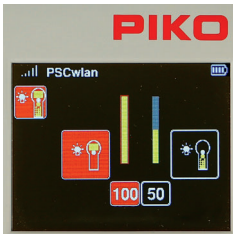
The following window contains the setting options for the display (left) and for the keyboard backlighting (right). Using the "right" and "left" navigation keys you can switch between the two options.

The value in the active field can be adjusted by turning the dial or using the "up" and "down" navigation keys.

The changes are executed directly and thus allow immediate control.

After the changes have been made, the "back button" will return you to the settings menu.

3.8.3 Setting the dial settings

The dial on the SmartController recognizes two types of speed settings and direction of travel settings. These are referred to as DC or AC throttle modes, since the functions are based on analog DC throttles used in the past and AC analog transformers (Chap. 3.3 "The Locomotive menu").

To change these settings, press key 3 or use the navigation keys to highlight this field and activate the menu with the OK button.
The following window contains the DC and AC options (AC style is the factory setting) which are selected with the navigation buttons and confirmed by pressing the OK button (the field selected will turn solid green).

The next line defines the maximum "double-click time" for the throttle in milliseconds. If the dial is pressed twice (double click) within this time (max. 999ms), an emergency stop command is sent to the active locomotive.

The "Last command applies" option is listed under the previous line. This is an option for layouts being operated with more than one throttle. If this function is activated, several SmartControllers can access the same locomotive at the same time and the command sent last is always executed, regardless of which throttle sent it.

Once all the settings have been made, go to the "Save" field and confirm your choice with the OK button.

The "back" button returns you to the settings menu.

3.8.4 SmartController sleep mode

If the throttle has not been used for some time during an operating session, it makes sense to go into sleep mode or shut down to conserve battery power. The time period between last use and activation of sleep mode or shutdown is adjustable. These options are set here.

To do this, press key 4 in the settings menu or navigate to this field and activate the menu with the OK button.

The following window displays the settings for switching off the screen and throttle. The desired application can be selected using the "up" and "down" navigation buttons.

A time setting (in minutes) can be selected with the "right" or "left" navigation buttons and confirmed with the OK button.

If the "--" field is selected, the shut down option will not be activated.

If the screen goes into sleep mode during an operation session, it can be re-activated with the press of any button on the throttle. After re-activation, the throttle will execute commands again.

If you choose to retain these settings, pressing the "back" button will return you to the Settings menu.

3.8.5 Select Wi-Fi network

NOTE: If the SmartController cannot connect to a Wi-Fi network after being turned on (the Wi-Fi symbol is crossed out), it will display a message asking if you want to use the "FastConnect" option. Select the "Yes" or "No" option.

The desired Wi-Fi settings can be entered into the Wi-Fi settings menu of the SmartController.

To do this, press key 5 in the settings menu or navigate to this field and activate the menu with the OK button.

Initially, the "Search" field will display on-screen. After confirmation with the OK button, the next window will ask if the throttle should connect directly with the command station via "FastConnect" or whether it should connect from a list of available Wi-Fi devices.


Here you can choose between "FastConnect" to an activated command station or "List" to show available Wi-Fi networks.

To select "FastConnect", highlight the field with the OK button. A message now appears saying "Transfer access data". Please wait for this to clear and then follow the instructions in the display.
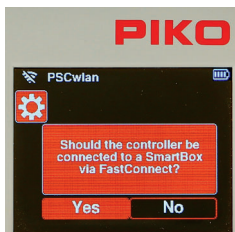
Answer this query with "Yes". If "No" is selected, use the "left" navigation button to navigate to the "Yes" field and confirm with the OK button.
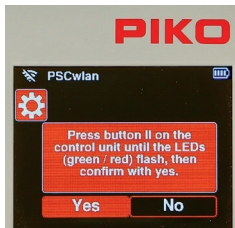

Press and hold the "II" button on the SmartBox until the "Run" and "Stop/Fail" LEDs flash in-synch. Answer "Yes" to the query within approx. 30 seconds.

The connection is established when the two LEDs on the command station stop flashing and the active Wi-Fi symbol appears on the display.

If an available Wi-Fi device other than the SmartBox Wi-Fi is to be selected, then scroll to the "List" entry and confirm with the OK button. Now all accessible Wi-Fi devices are displayed. This list also contains the desired SmartBox, which is now selected using the "up" or "down" navigation buttons and confirmed with the OK button.
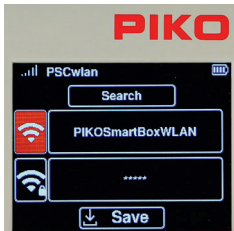
The selected Wi-Fi device now appears in the display. If you want to change the name of this Wi-Fi device, press the "down key" and the activated field will change from "Search" to the Wi-Fi symbol.

Confirm this with the OK button. The name field is now solid red and the new name can be entered using the "telephone keypad".

Complete the name entry with the OK button.

The line with the "Wi-Fi / lock" symbol can be selected here to enter the Wi-Fi password. The subsequent "OK" button will open the input field, where you can type a password that is automatically entered into the field as hyphens. If you want to exit this field without making any changes, first delete the hyphen with the "left" navigation key and then exit the field using the "back" key. If, on the other hand, a password of at least 8 characters should be assigned, this can be entered using the "telephone keypad" and confirmed with the OK button. The factory password is "abcd1234".

Finally, your entries are saved via the "Save" field followed by pressing the OK button. The display will jump back to the settings menu to select further settings.

3.8.6 General Settings (SmartController)

In the general settings menu, the throttle can be given a new name, you can set the Wi-Fi transmission intensity, you can assign a new PIN to block various input and operating options, and the Controller can be reset to the factory settings.

To do this, press button 6 on the keypad in the settings menu, or navigate to this field and activate the menu with the OK button
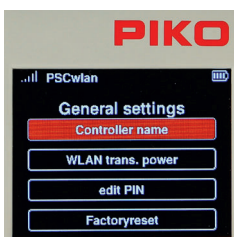
By selecting the first field "Controller Name" the window changes to the name input field.

In this field, the Controller name can be changed as you wish. To do this, activate the Name field with the OK button. Then enter the new name using the "telephone keypad".

Once the name has been entered and confirmed with the OK button, save the new name in the Controller via the "Save" field. The window then returns to the general setting options.

In the submenu that follows, you can set the throttle's Wi-Fi transmission power.

A range of values from 0 (low) to 10 (maximum) can be chosen here.

Select the menu to activate the input field by using the OK button and enter the desired value between 0 and 10 and then confirm it with the OK button.

Finally, save this change via the "Save" field in the display.

The window then returns to the general setting options.

You can assign a four-digit PIN number to the SmartController to protect sensitive data input, or to limit the throttle's applications (a child safety lock). Select the "edit PIN" submenu to enter a PIN.

The factory-assigned PIN (0000) will be displayed on top of the solid red field while the new PIN is entered in the lower part of the solid red field. The new PIN is entered using the keypad and then confirmed with the OK button. Incorrect entries can be deleted using the "left" navigation key. If you want to leave the menu without making any changes, the "back" button will take you back to the settings menu.

The Controller can be reset to factory settings by highlighting the last field in the settings menu. To do this you will have to use the PIN you created in the previous step. The following Controller settings are then reset to factory settings: the Wi-Fi password, the Controller name, the throttle mode, sleep mode/shutdown settings, screen/keyboard brightness, and your PIN. "Locked" menus will become unlocked.

To reset the Controller to factory settings, navigate to the "Factory settings" submenu and confirm with the OK button.

Now enter your four-digit PIN and confirm with the OK button. Once the Controller is rebooted it is restored to factory settings.

3.8.7 The Information menu

The Information menu allows you to view a wide range of information about the Controller, the track status and the SD card.

It is accessed by pressing button 7 on the keypad (while in the settings menu) or by navigating to this field and selecting the menu with the OK button.

Five submenus are displayed: "Track Monitor", "Firmware", "Image Database", "Search Online" and "Serial Numbers".
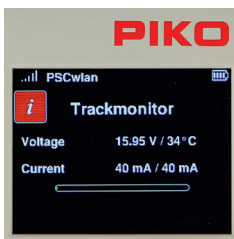
The layout monitor: This menu shows the current state of the track output on the SmartBox along with track voltage, operating temperature, current draw, and the highest current draw during the present operating session (right Value).

The green area in the "current bar" shows the present current draw in relation to the maximum possible current. The red marker shows the highest current draw during the present operating session.