DK50018

Instruction manual

Introduction

The DK50018 is what we call a "Next Generation" decoder that uses mobile phone and multimedia technologies to make it universal and usable by the greatest number of people. The great advantage of the DK50018 is that it offers quick and easy programming using a proven wireless communication technology called Bluetooth. This protocol allows high-speed communication for transporting audio/video content or exchanging files, as well as programming devices over short distances (0 to 10 metres maximum).

Where it could take hours to program an accessory decoder for maximum optimization, with the DK50018 you only need a few minutes via the dedicated Digikeijs mobile App, which is available for the Android and iOS platform. In this way, turnouts, signals, lights, etc. can be installed on the same module with just a few touches/slides. The DK50018 can still be programmed in the more traditional way through POM (program on main) or via the prog track mode through your preffered command station.

Next to this manual we have created video instructions that can be found on our youtube channel

https://www.digikeijs.com/youtube

1.2 Warranty and its application

All our products have a 24 month manufacturer's warranty but please take the time to read this instruction manual carefully.

Any damage or destruction caused by not following this manual will void the warranty.

Note: No warranty is possible if the DK50018 case has been opened.

1.3 Legal information

 All rights, modifications, typing and printing errors and delivery options are reserved.

Specifications and illustrations are non-binding and without obligation. All changes to hardware, firmware and software are reserved. We reserve the right to change the product design, software and/or firmware without prior notice.

2.0 Product overview

2.1 Technical specifications

The connection terminals for power and signal (track voltage) are designed for a cross-section of 0.5mm². The terminals for Out 1-8 are designed for a cross-section of 0.34mm². Each Out (1-8) consists of two outputs. The terminal with the designation "C" is always the common pole and always carries (+) potential. Terminals 1-18 are the respective outputs and always carry (-) potential. The DK50018 switches to minus (-). Bluetooth can be used throug the Digikeijs app which you can find in the iOS apple store or Android google play store. Firmware updates are only possible via the Digikeijs App.

Please note that the DK50018 has build in short circuit protection to protect its outputs and connected devices when there is a short circuit. When this happens the red LED will burn until the short circuit is resolved. Please note that this protection is not an overload   protection. **Solenoid point motors like the Peco Pl-10, PL11, PL-1000 and Seep PM-1, PM-2 should not be directly connected to the DK50018 as they draw too much current and this will damage the DK50018 and most likely your Point Motors**. You can still have all the benefits of the DK50018 and the Digikeijs app by adding a simple add-on in between your point motor and the DK50018. We will give more information on this very soon through our normal communication channels.

	Number of outputs	Protocol	Maximum load per output	Total load Supported	Power supply	Dimensions in mm L X W X H	Bleutooth
DK50018	16 X outputs OUT1-OUT8 GROUP 1– 4	DCC MM	2.8A	3A	12-24 V DC Ideally 12 DC/3A or DCC rail current	87 x 80 x 22	BLE 4.1

Note on selecting a power supply

When using "old" transformers (AC output), malfunctions may occur during operation under certain circumstances. When using a transformer, it must also be noted that the output voltage of the transformer must be multiplied by 1.4 and therefore a higher voltage is applied to the output of the DK50018 than to the input (power). For this reason we generally recommend the use of switching power supplies with at least 12V (DC) output voltage (DC voltage) and 3A output power at maximum load of the outputs.

2.2 Connections

Please take note on the following terms we use. A **group** consist out of 2 **outs** and is mainly used for signals. An **out** consists out of 2 **outputs** and a shared **common** (+)

Group 1	Out 1	1 = - C = + 2 = -
	Out 2	3 = - C = + 4 = -
Group 2	Out 3	5 = - C = + 6 = -
	Out 4	7= - C = + 8 = -
Group 3	Out 5	9 = - C = + 10 = -
	Out 6	11 = - C = + 12 = -
Group 4	Out 7	13 = - C = + 14 = -
	Out 8	15 = - C = + 16 = -

9	**Power input**
10	**Green LED Power on**
11	**Programming button**
12	**Yellow LED** **DCC Activity and Programming mode**
13	**Blue LED** **Bluetooth connection is active. Flashes when their is activity**
14	**Red LED** **Short circuit indication**
15	**Connection to the DCC signal**
16	**Empty field to write the name**
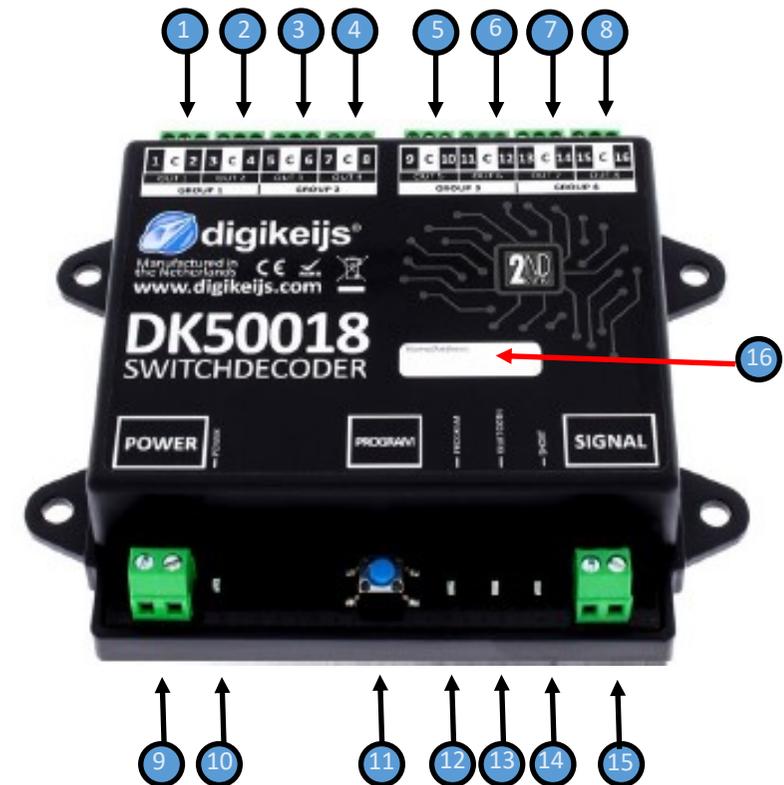
2.3 Power supply and signal connection options

Power supply
12-24V DC/AC
Minimum recommendation
12V DC 3A

Signal   Connection to the **main track output.**

Power   Power via **external power supply.**

Recommended configuration for normal use and for programming in POM mode.

Signal   Connection to the **main track output.**

Power   Power via the **main track output.**

Alternative configuration in normal use and for programming in service / prog mode.

2.4 Roadmap and improvements

Recently we have created a roadmap for our products, this roadmap will show you what we are working on and if their are open issues. You can find this roadmap trough below link, if you have any issues or suggestions please contact us through our support platform

https://roadmap.digikeijs.com

3.0 Configuration through the Digkeijs APP

3.1 Configuration via Bluetooth

In order to fully enjoy your DK50018 we advise you to start by downloading the Digikeijs app which is available for both Android and iOS.
Both versions of the App are identical, so it does not matter if you use Android or iOS.

For Android the minimum version is 5.0 or higher, and your device needs to support BLE (Bluetooth Low Energy).

Digikeijs Android App: https://www.digikeijs.com/android

For iOS the minium version is 12.0 or higher, and your device needs to support BLE (Bluetooth Low Energy).

Digikeijs iOS App: https://www.digikeijs.com/ios

3.1.1 Application configuration

Now that the app is installed, the first screen will give you multiple options.

Use App without account

This option will allow you to fully use the app, connect and configure your devices but will only save your data locally on your device, this means if you remove the app your data will be lost, you can also not share your devices or configurations on other devices.

Create account

This option will guide you in making a new account that can be used within the app. This way you will save your devices and configurations in your profile so you can use it on multiple devices or you can load it again when you for example have a new phone or tablet.

Sign in

You can login with the account created in option 2. Please note this will only work with accounts created in the app. Your Digikeijs support or webshop account is not related and cannot be used within the app. When you are signed in you can change the language or remove your account through the top right menu.

App version and change Language options

On the top right their is another option to change the language of the app. By default the app uses the default language of your mobile phone or tablet. From this menu you can see the version number of the app.

3.1.2 How to add your device to the Digikeijs App

Now that the app is configured we can start with adding your DK50018.

This process is very simple. Firstly navigate to the My devices page. The first time you open this page it will ask you to give permissions to use your location. This is needed in combination with Bluetooh (BLE), otherwise you will not be able to find and add any devices. *Please note we do not save or track your location!*

When the proper permission is given you can hit the + button to search for devices. Please make sure your DK50018 is powered on and the green led is lit.

In the add devices screen the app will show all powered on devices. If you already added devices and do not want to show them in the list you can toggle the "show my devices" checkbox. Ticked = Show all, Not ticked = Show devices that are not added yet.

To add the device select the one you want to add and give the device a name. After that the device will be added to the my devices page.
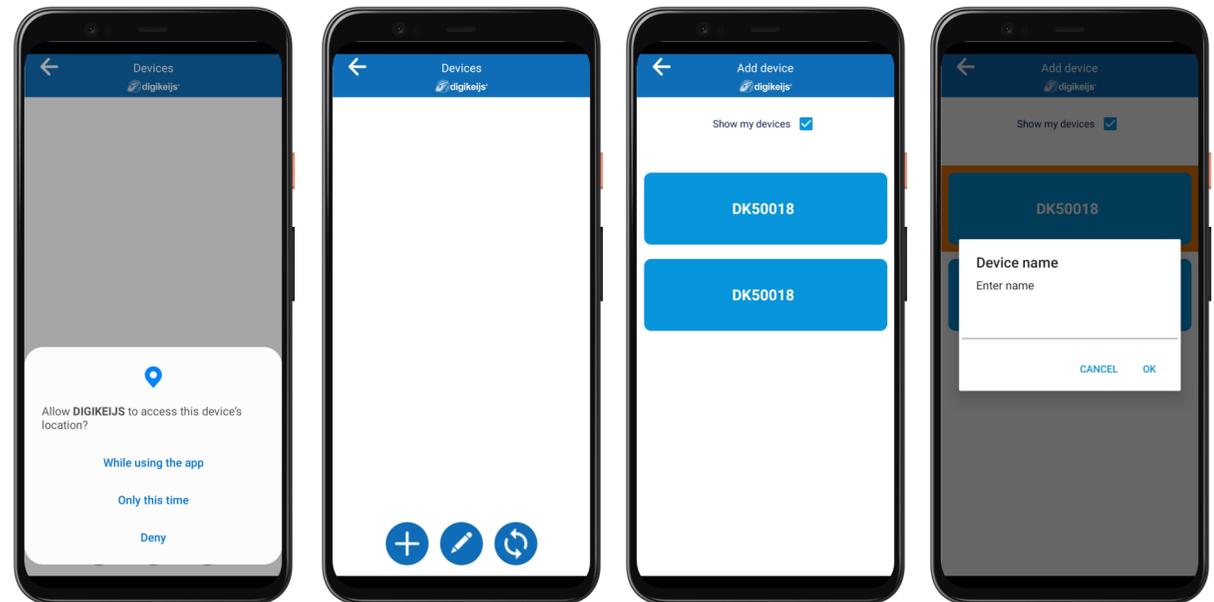
3.1.3 Device page

Within the devices / my device page you will see all the devices you have added to the app. When your devices are not online (power is off, bluetooth connection cannot be made) they will show as grey (4), when they are online and you are able to connect to them they wil turn blue.

Explanation of the different options and icons.

Device icons

1. Green icon, device is online and you can connect

2. Open lock, device can be found by any device. Closed lock, Bluetooth broadcasting is disabled and device cannot be found by other devices

3. Update icon, when this icon is shown it means there is a new firmware that has not been installed yet.

Bottom options

1. Add a new device

2. Edit / remove a device

3. Manual refresh Bluetooth
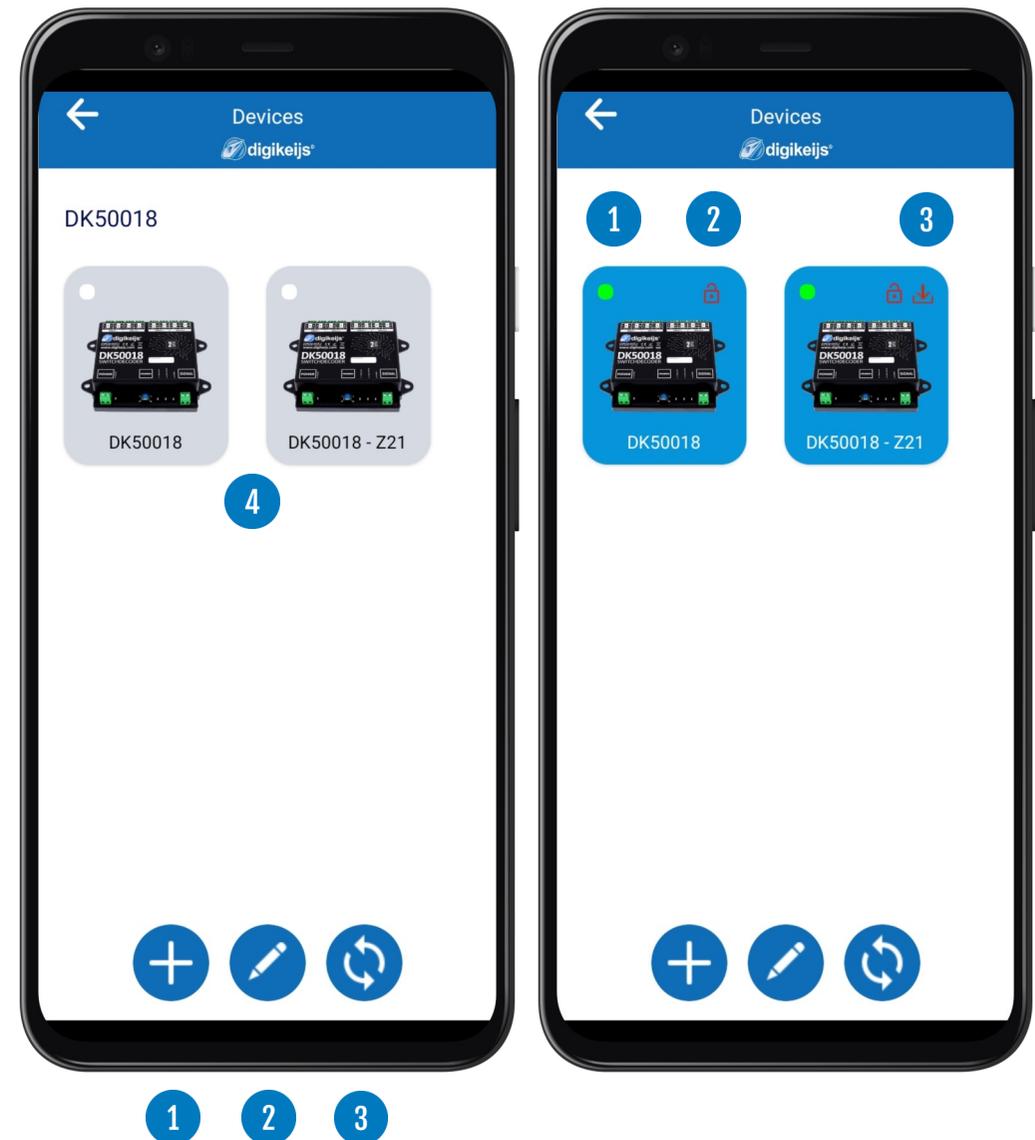
3.1.4 DK50018 main options

Now that the device is added to the app and the connection is opened let's explain the options that are available. Please note the X on the top right corner is used to disconnect the device from Bluetooth and will bring you back to the main page of the app.

Update firmware
Within the update firmware section you can view the current firmware version of your device and you can see the latest firmware available. Through the firmware section you can easily downgrade or update the firmware to your needs.

Start configuration
Within the configuration section you can configure the device and view and load previously saved configurations. In addition you can set the start address and open the switchboard.

Open Switchboard
When you open the Switchboard option, you will see 16 addresses that can be switched. The address numbers depend on the start address you have configured. Red means OFF, when you push the red address number it will turn Green, this means ON. You can now use the switchboard to use or test your attached devices. Please note this switchboard only uses Bluetooth and will not switch any other dcc addresses.

Decoder address
When you open the decoder address option, you can change the default decoder address (9999) to any other address you want, this can be a short or long address.

Lock / Unlock
To prevent other people / devices connecting to your DK50018 you can lock the device for Bluetooth broadcasting. When locked the device cannot be found anymore by other devices.

Reset to default
The reset to default option will reset your device. In practice this means preset 0 will be loaded and the start address of the device will be set to 1. This option will only reset the physical device! Any saved configurations will still be available within the app and can be loaded through the saved configurations options.

DK50018 - DK50018 - Z21

UPDATE FIRMWARE

START CONFIGURATION

OPEN SWITCHBOARD

DECODER ADDRESS

BLUETOOTH LOCK

RESET TO DEFAULT

ONLINE HELP
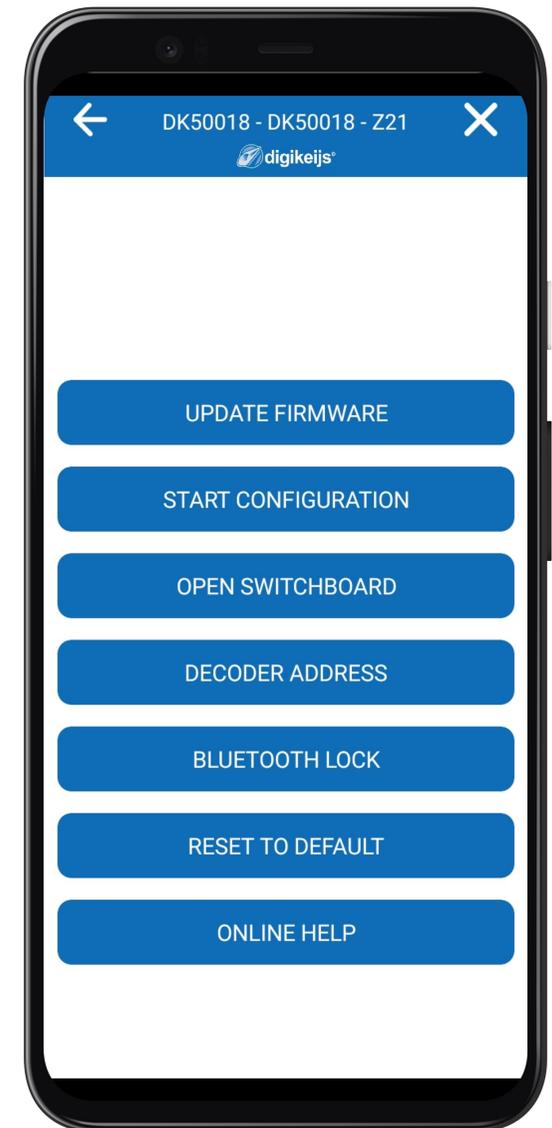
3.1.5 Start configuration

Load preset on all outputs

The load preset on all outputs option is used to select a preset and load them on all outputs. This would mean that all outputs will be configured exactly the same way based on the preset selected. Within the load preset on all outputs, you can also set the start address of the device and open the switchboard. You will find more information on the different presets further in this document.

Load preset per output

The load preset per output option can be used to load a specific preset on 1 or multiple outputs. This way you can easily configure multiple presets on one device, for example you can add 2 turnouts and 3 signals within a few simple clicks. During the configuration you can easily select the address per preset if needed.

Custom configuration

This option is still in development, more information will follow when available.

Saved configurations

Within saved configurations you will find the configurations done through preset per output. In the saved configuration screen the dark blue row is the currently active configuration.
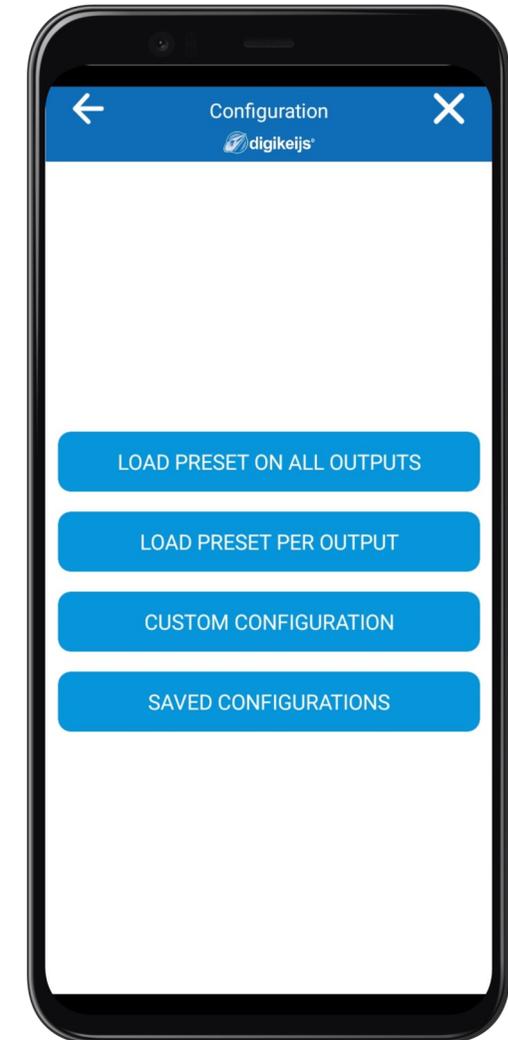
3.1.6 Preset information

Below you can find and overview of the available presets and addresses used per preset. We will be adding more presets. If you have any suggestions please create a ticket through our support platform support.digikeijs.com

Please note Solenoid point motors like the Peco Pl-10, PL-11, PL-1000 and Seep PM-1, PM-2 should not be <u>directly connected </u>to the DK50018 as they draw to much current and this will damage the DK50018 and most likely your Point Motors.

Preset	Description	Occupied addresses
0	8x Turnout magnetic drive without limit switch	8
1	16x On / Off (No effects)	16
2	8x Two-light signal with fade effect	8
3	8x AHOB simulation	8
4	2 groups of 8x fluorescent lighting effect	2
5	1 group of 16x fluorescent lighting effect	1
6	8x Turnout with motor drive with limit switch	8
7	4x Dutch Railway signal	16
8	4x DB Main signal	16
9	4x DB pre-signal associated with main signal	16
10	2x Combination of DB Main signal and pre-signal	8
11	4x DB Pre-signal	16
12	4x Belgian NMBS Signal	16
13	8 x Turnout with motor drive without limit switch	8

If you want to learn more about above presets and find more technical information on the default cv values please take a look at the following faq

https://support.digikeijs.com/hc/en-us/articles/360018631717-Preset-information-and-default-CV-values

3.1.7 Load preset on all outputs

Load preset on all outputs

When the load preset on all outputs section is loaded, the app will show you which preset is currently active. This preset will be coloured blue. If a custom configuration / preset per output is loaded it will show the name of the active configuration. When you want to change the preset just select the preset you need. The selected preset will now be coloured blue and will be active.

Open switchboard

From the preset all output section you can open the switchboard to use or test your outputs by turning them on or off.

Set Start address

You can use the set start address to change the start address of the device. When you open this section it will show you the current start address. When using a roco black or white command station you can choose "Use Roco addressing". This option will remove the +4 address offset that occurs when not using RCN-213 turnout addressing. When done please select the configure device button and the start address will be changed.
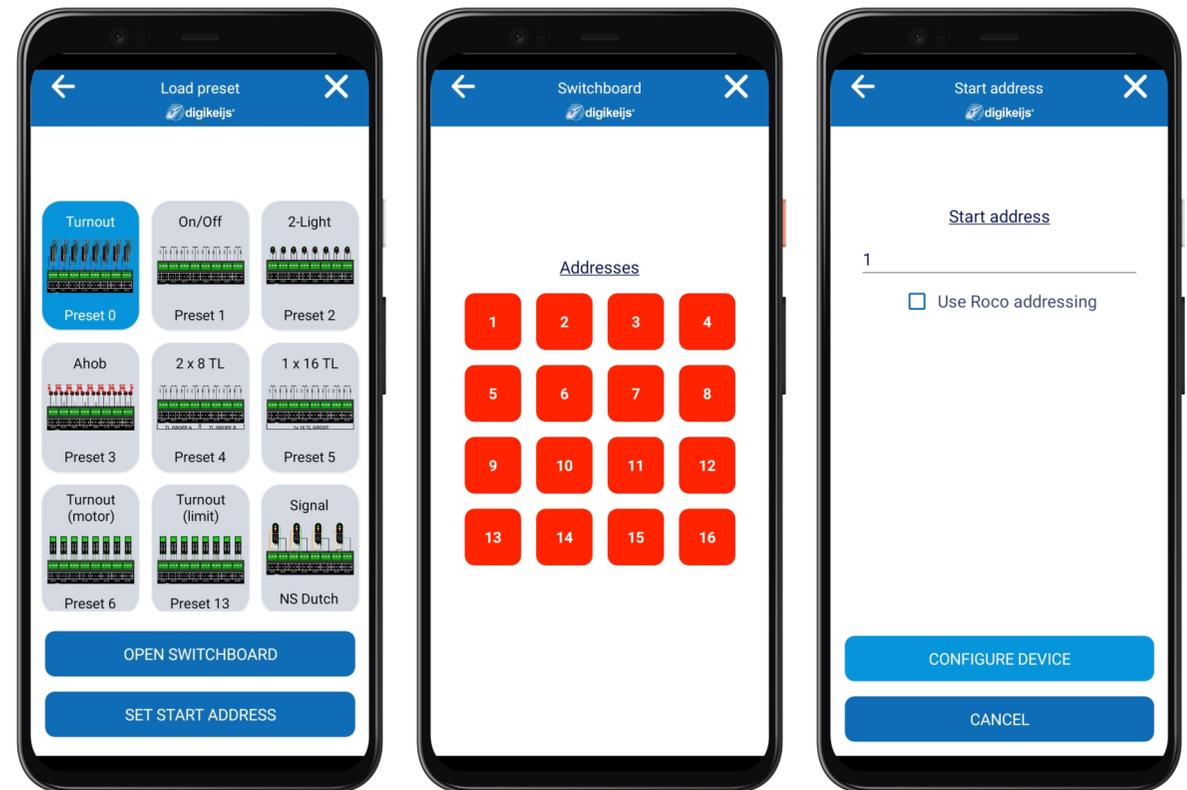
3.1.8 Load preset per output

Within the load preset per output section you can easily set up a specific preset per output. In the past this could only be done by extensive cv programming but now you can very easily do this through the app and load preset per output process.

Step 1

Enter the start address you want to use, this can be any address number between 1 and 2048 but please keep in mind that every preset has a set number of needed addresses so this could limit your start number when you go higher than number 2033. The app is smart and will tell you when you need to change the start address. You can find more information on the presets and set of addresses on the preset information page in this document.

Step 2

Select the preset you want (1), the preset screen will now open. You can select the address you want to use within the range available based on the start address given in step 1. After that you can select to which output the selected device is connected (3). If you want the same addresses to control multiple outputs you can select multiple outputs, if you want separate addresses per output you only select one and add multiple presets in the first screen. When you have selected the address you want to use, the output which the device is connected to you can select the Save button and you can setup the next preset. The app is build in a way that you can only select the addresses, outputs and for signals the groups that are still available and are not used yet.

Step 3

When you are done with setting up your presets per output please select the Configure device option (4). You will be asked to give the new configuration a name. (5) This can be anything you want. When selecting OK the App will configure the device. When done the app will show the configuration page (6), from there you can, configure the device again, edit the configuration, remove the configuration or open the switchboard.
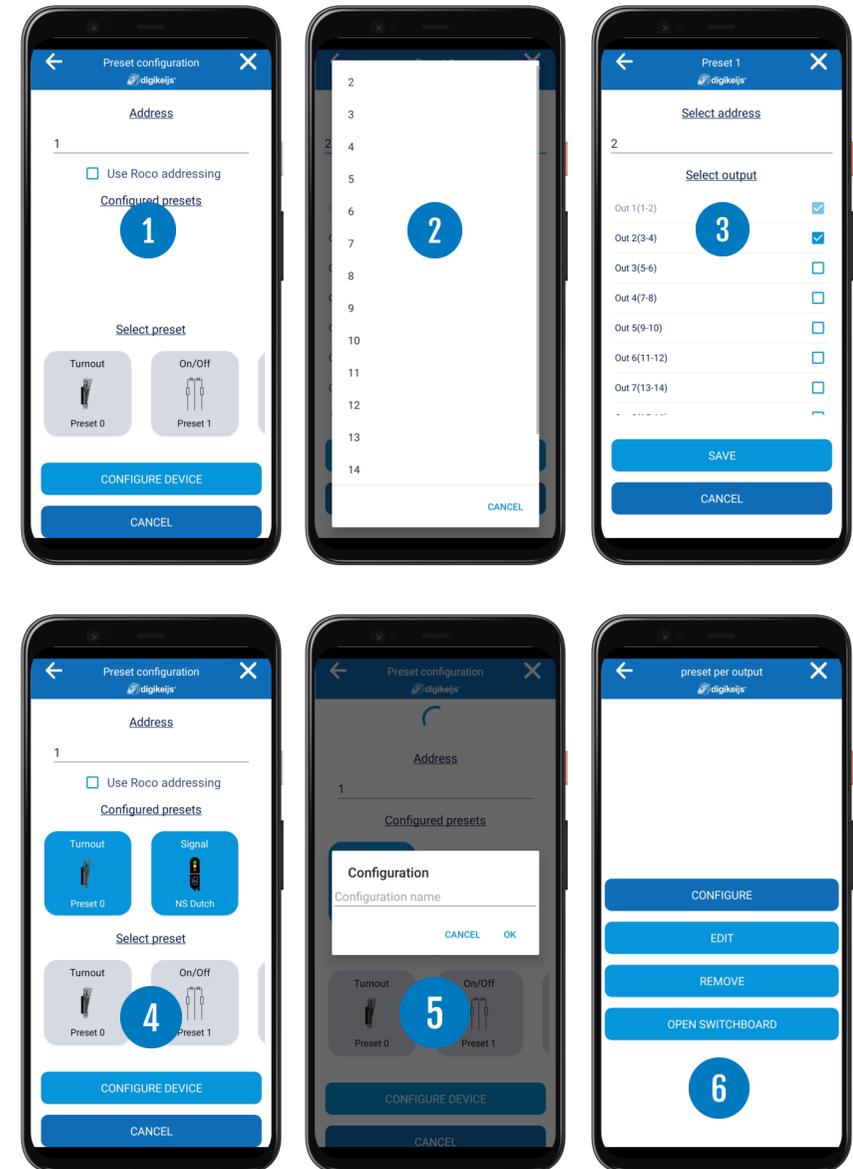
4.0 Configuration through DCC

4.1 DR5000 Set device start address through DCC

Accessory addressing is always assigned by an accessory switch command! Make sure that the DK50018 is powered by the decoder power connector. Please make sure the "signal" connection of the decoder is connected to the track output of your command station!

1. Press the programming button on the DK50018 and the yellow led will stay on, meaning the DK50018 is in ,,Programming" mode.

2. Please determin the start ddress number you want to use and open op your control software or select this switch number on your throttle

3. Now send a switch command for the address you determined in step 2

4. When step 3 is succefull the yellow led will go off, indicating that the programming has been successfully completed.

5. Depending on the preset you use it will have 1 to 16 addresses starting from the address **programmed in** step 4

Power supply

12/24V DC/AC

mininum recom-
mended 12V DC 3A

Yellow LED

The start address for the DK50018 is always assigned through a switch command, but never via CV 1!!! If CV 1 is written with an address, the decoder can no longer be programmed via locomotive address 9999!

4.1.1 DR5000 — Programming through POM*

1   Enter the 9999 locomotive address with 128 speed steps into your control unit, Multimaus or other application. The DK50018 can be programmed through the same way as a locomotive decoder using this type of addressing.

2   Select locomotive address 9999 in the control unit, Multimaus, or other application Etc.... Activate and deactivate the F0 (light) function for simulate the "locomotive" in the control panel.

3   Press the DK50018's programming button. The Yellow LED is now lit continuously and indicates that the DK50018 is in "programming mode".

4   Select the CV programming function via the POM mode in the control panel, application or hand control. (For more information on bit-by-bit CV programming, refer to your control panel manual).

5   You can now program your preffered CV values through POM, more information on the default cv values can be found through below link
https://support.digikeijs.com/hc/en-us/articles/360018631717-Preset-information-and-default-CV-values

6   To exit the DK50018 programming mode, you must press the programming button again. The yellow LED will go off indicating that the programming mode is completed.

Power Supply

12/24V DC/AC

mininum recommended 12V DC 3A

Yellow LED

*:POM stands for Program On the Main and corresponds to the direct programming on the track or "track output" of the control unit.

4.1.2 Z21 App — Set device start address
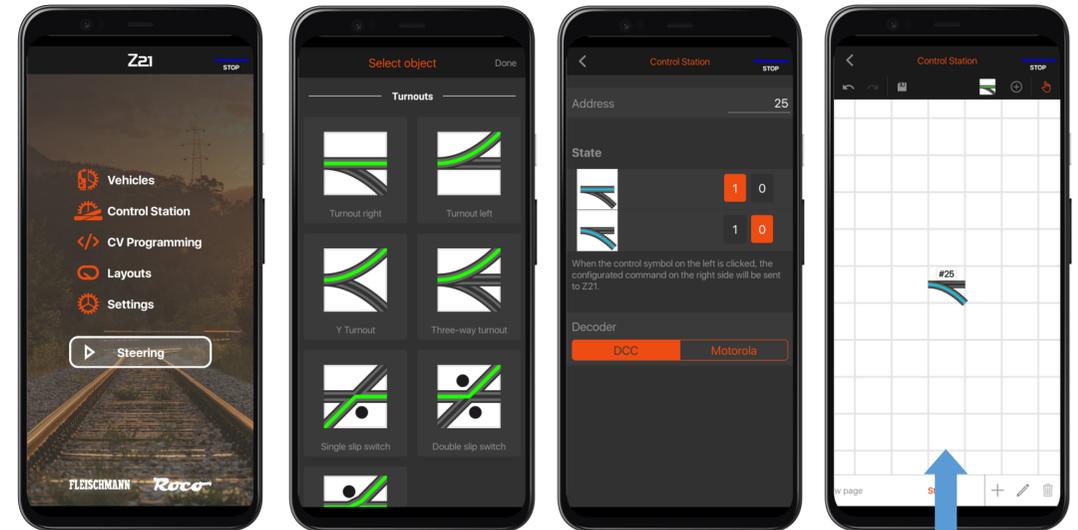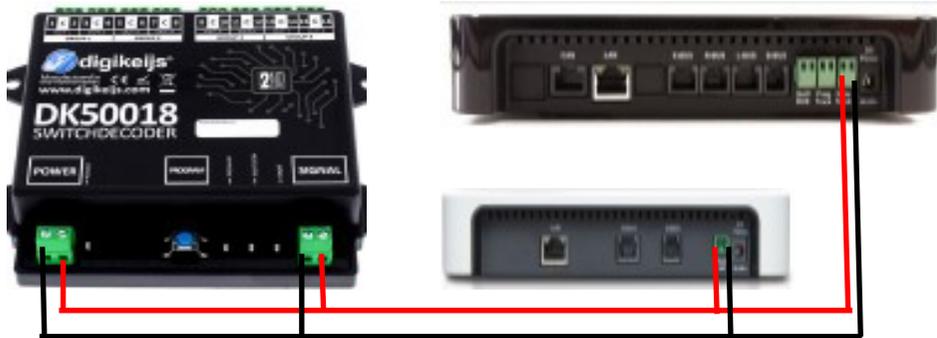
Programming of the base address (output 1).

1. Connect the DK50018 to the output of the z/Z21 main channel.

2. Open the Z21 app and select control station

3. Add a new turnout and change the address to your liking

4. Press the programming button on the DK50018. The yellow LED lights up.

5. Press the programming button on the DK50018. The yellow LED

6. Press the corresponding switch symbol on the display. The yellow lights up. The LED on the DK50018 will go off which means it was succesfull.

4.1.3 Z21 App — POM programming

In the following example we will program the DK50018 to use preset 2 using CV47— Value 2

1. Connect the DK50018 to the output of the z/Z21 main channel.

2. Open CV programming —> Manual —> POM in the Z21 App.

3. Press the programming button on the DK50018. The Yellow LED will be lit

4. On the Z21 app, set the Loco address to 9999 and change CV address to 47 and CV value to 2.

5. Hit the Set CV button and your change will be written to the DK50018

6. Press the program button on the DK50018 button, the yellow led on the DK50018 should go off which means that the DK50018 has closed programming mode and now has preset 2 as active preset.
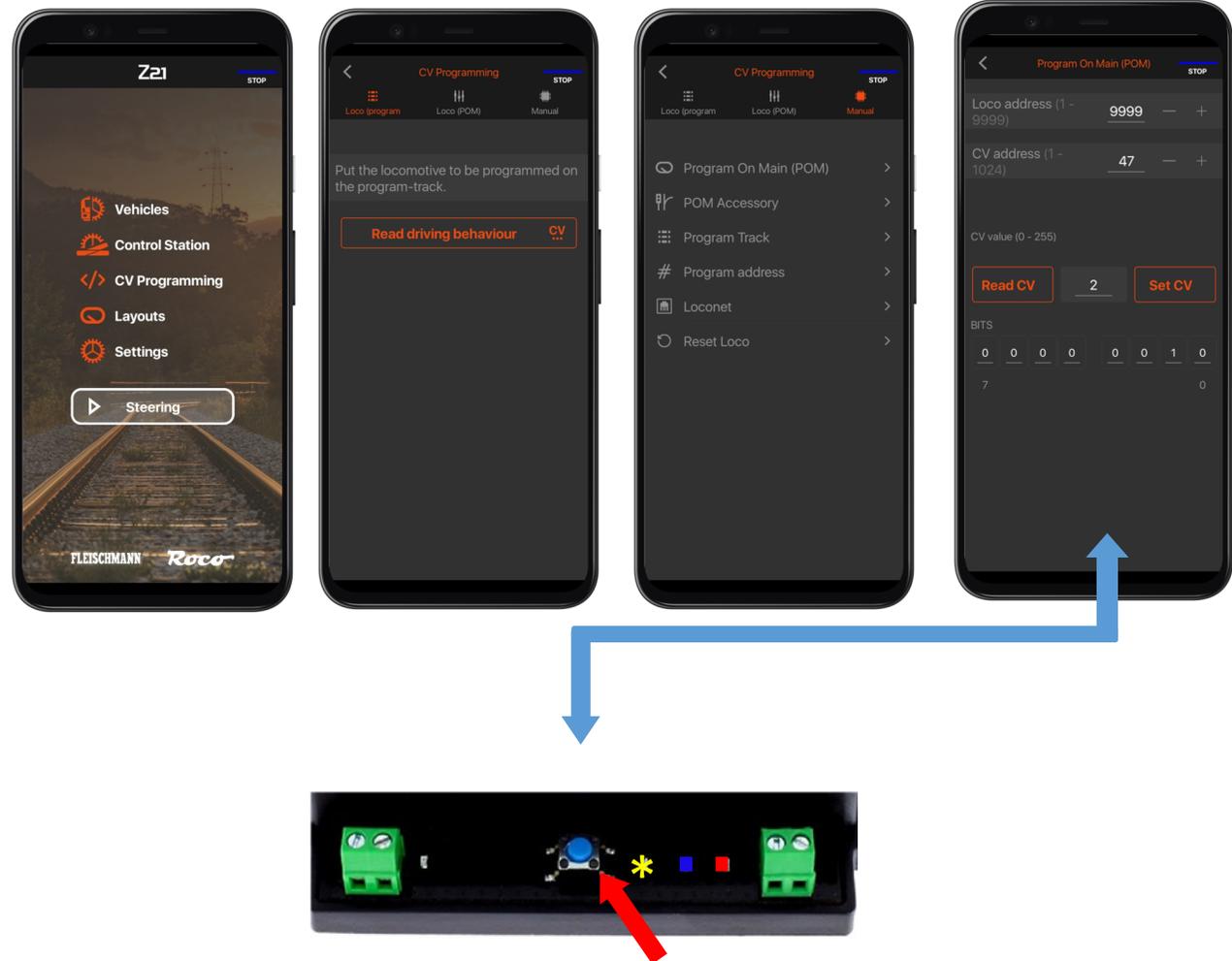
*:POM stands for Program On the Main and corresponds to the direct programming on the track or "track output" of the control unit.

4.1.4 Programming the start address

with the Multimaus

Programming the start / base address (output 1).

1. Connect the DK50018 to your main track output.

2. Select the desired address as start address via the numeric keypad of the control.

3. Press the programming button on the DK50018. The yellow LED lights up.

4. Press both buttons on the Multimaus simultaneously. The yellow LED on the DK50018 should flash and go off, which means that the start address is stored in memory.
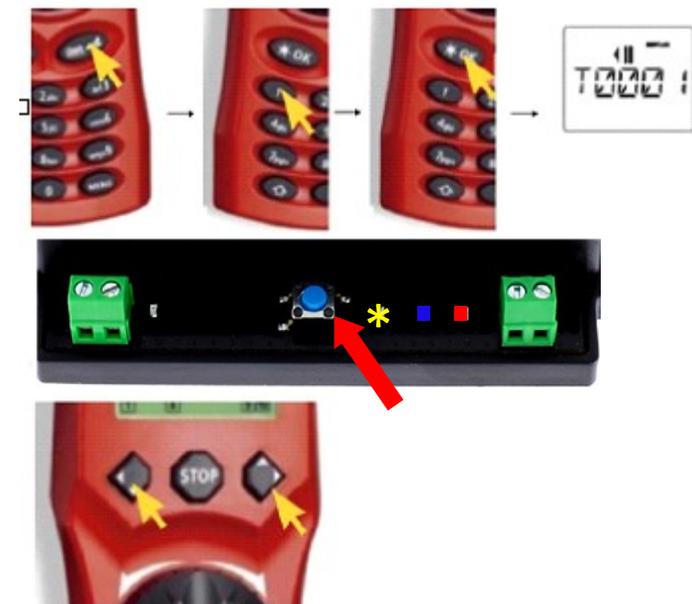
4.1.5 Multimaus—POM programming

In the following example we will program the DK50018 to use preset 2 using CV47— Value 2

1. Connect the DK50018 to the Z21 main track output.

2. We create a new locomotive in the Multimaus with the address 9999.

3. Enter the name of the new locomotive for example ,,LOK1" and press ,,OK"

4. Press both eraser keys on the Multimaus simultaneously to select the newly created locomotive

5. Press the program button on the DK50018. The yellow LED on the DK50018 should be lit.

6. Simultaneously press the arrow and "Menu" buttons to enter the the programming menu. Please make sure POM mode is selected.

7. Select the CV modification option and enter CV 47 and press ,,OK"

8. Enter the desired value, in this case 2 and select ,,OK" again.

9. You have now change to preset 2, please close the programming mode by pushing the program button on the DK50018. The yellow led will go off.
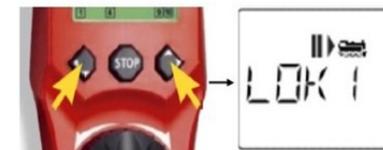
*:POM stands for Program On the Main and corresponds to the direct programming on the traffic lane or "Track output" of the control unit.

4.1.6 Programming example with

the Uhlenbrock™intelibox

Programming the base address (Out 1).

1. Connect the DK50018 to the intellibox's main channel output.

2. Select "Keyboard Mode" on the control panel by pressing the [Mode] button until "Keyboard" appears on the display.

3. Now select the base address by pressing the [Menu] button.

4. Press the DK50018 programming button so that the yellow LED lights up.

5. Switch the selected address on your Intellibox. The yellow LED on the DK50018 should flash on and off, which means that the starting address is stored in memory.
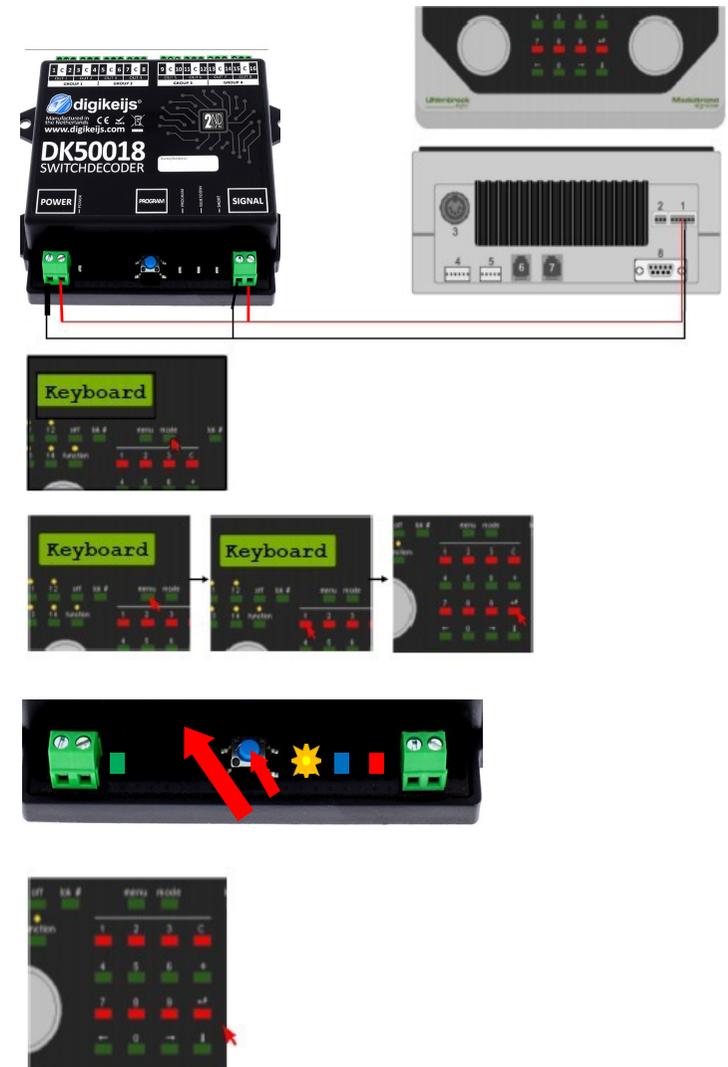
4.1.7 Programming with the Uhlenbrock intellibox in POM* mode

In the following example we will program the DK50018 to use preset 2 using CV47— Value 2

1. Connect the DK50018 to the Intellibox main channel output.

2. Enter the programming mode on the control panel by pressing the [Mode] button until "Programming" appears on the display.

3. Press the [Menu] key, select the DCC Program ->DCC Program option. DCC Program ->Main track Prog.

4. Press the Button on the DK50018 and the yellow LED should light up.

5. Enter the address 9999 and press the [Enter] key, call up the CV47 and press the right key [->]. Now you can enter the value, in this case 2.

6. Press the [Enter] key to set the desired value for DK50018.

7. You have now changed to preset 2, please close the programming mode by pushing the program button on the DK50018. The yellow led will go off.
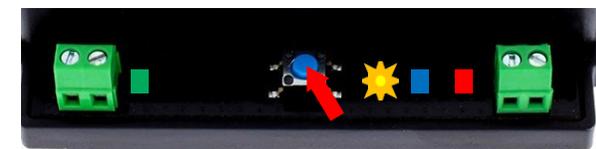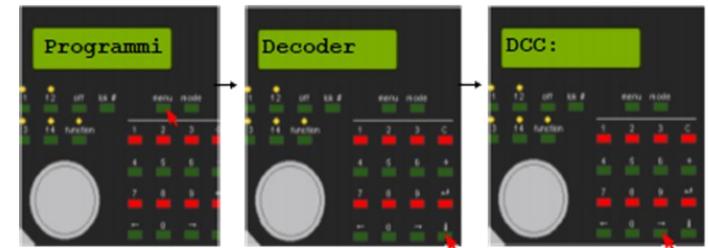
*:POM stands for Program On the Main and corresponds to the direct programming on the track or "track output" of the control unit.

4.1.8 Programming the start address with a Lenz control unit

Programming the base address

1. Connect the DK50018 to the main channel output of your LZV100 or higher.

2. Press [F] until [*S/W*] appears on the LH100 display, then press [Enter]. Enter the desired value for the first switch and press [Enter] again.

3. The selected address now appears on the display.

4. Press the button on the DK50018 and the Yellow LED should light up.

5. Switch the switch address using the [+] and [-] keys on the LH100 control unit. The yellow LED on the module goes off when switching to the selected address confirming that it is stored as the start addres.
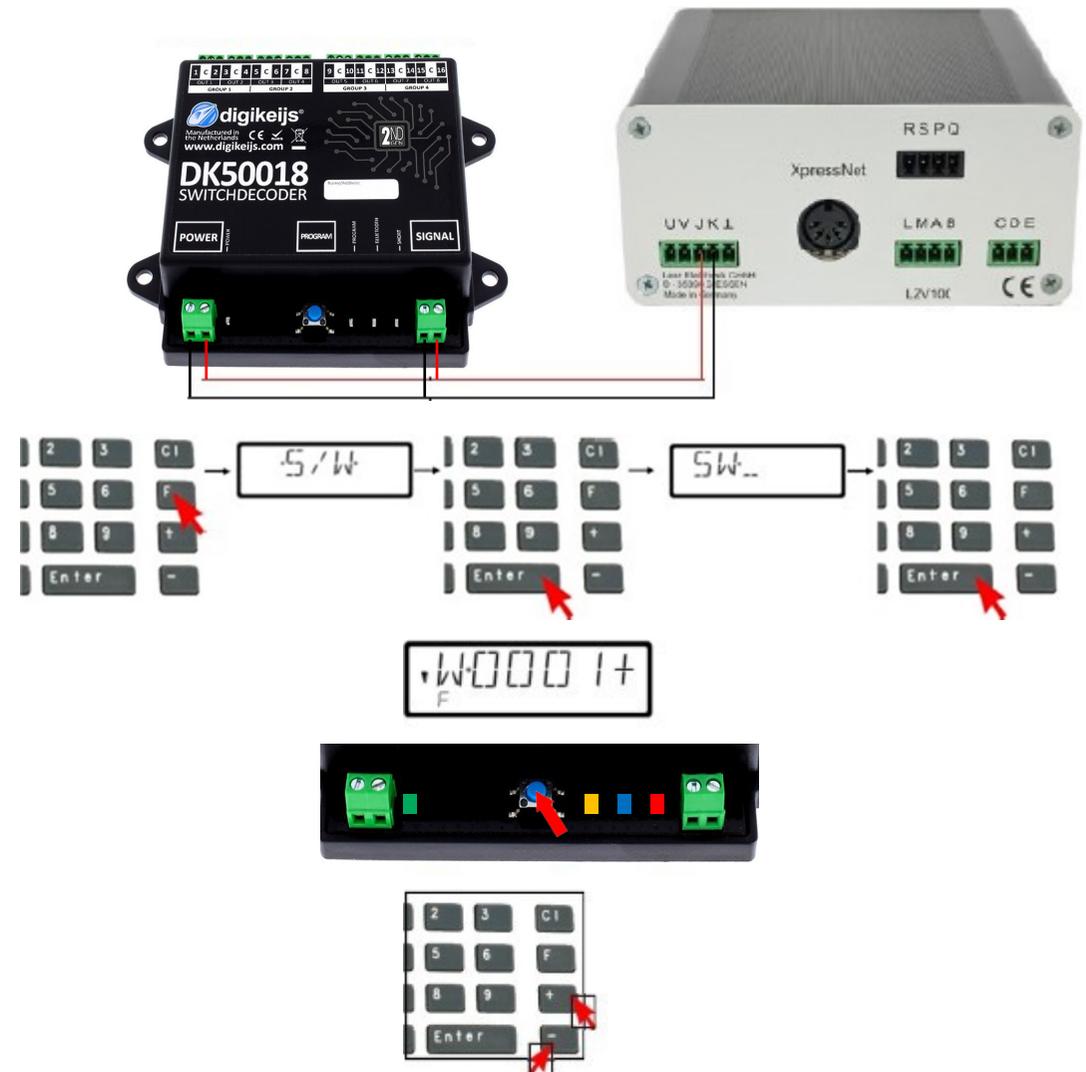
4.1.9 Programming with a Lenz control unit in POM* mode

In the following example we will program the DK50018 to use preset 2 using

CV47— Value 2

1. Connect the DK50018 to the main channel output of your LZV100 or higher.

2. Press the [CI] button and enter the locomotive address 9999.

3. Press the [F] button until [*Pom*] appears on the LH100 display, then press [Enter] until [*CV*] appears and press [Enter] again.

4. Enter the CV you want to change, in this case cv 47 and value 2 and press [ENTER] again.

5. Press the DK50018 button and the yellow LED should light up.

6. Press [ENTER] to send the modified CV value.

7. To exit the DK50018 programming mode, press the module button again and the yellow LED on the decoder should go off, indicating that the change has been stored.
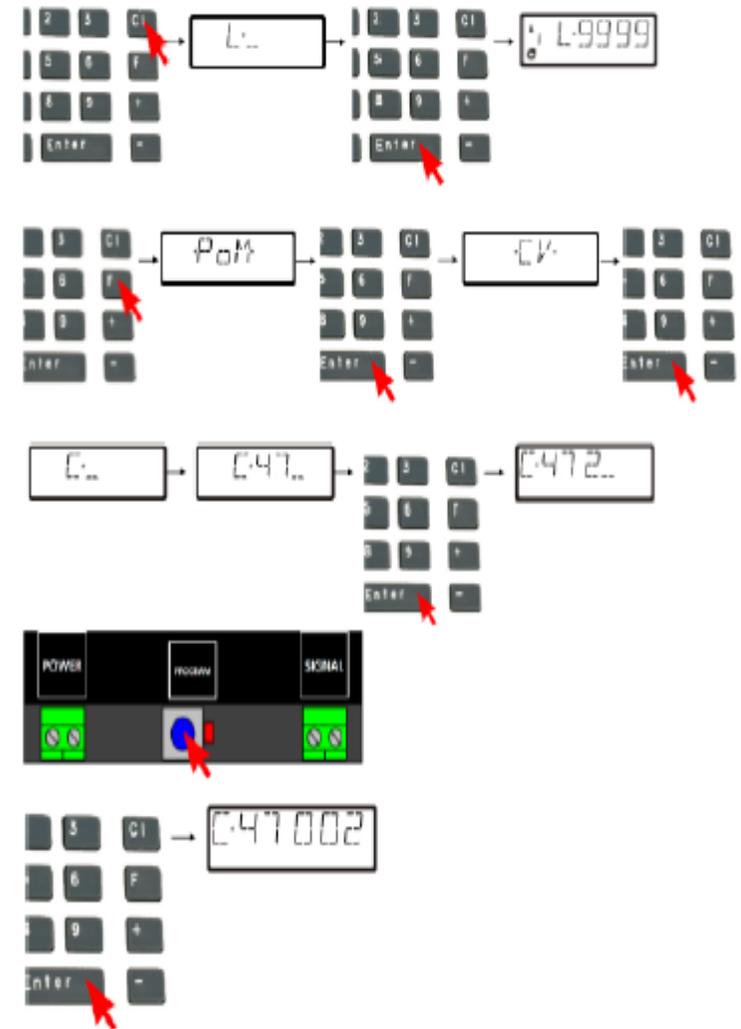
*:POM stands for Program On the Main and corresponds to the direct programming on the track or "track output" of the control unit.

4.1.10 Factory reset in POM* mode

Connect the signal and power terminals of the DK50018 to the channel output of your control unit. Make sure that the green LED next to the power connector is lit. It is also possible to connect an external power supply to the "Power" terminal (min 12v/3A). The DK50018 cannot be read via the RailCom bus.

1. Enter the locomotive address 9999 in 128 speed steps in your control unit, Multimaus, and other application Etc.... The DK50018 can be programmed in the same way as a   locomotive decoder using this type of addressing.

2. Select locomotive address 9999 in the control unit, Multimaus, and other applications Etc.... Activate and deactivate the F0 (light) function to simulate the "locomotive" in the control panel.

3. Press the DK50018 programming button. The yellow LED is now lit continuously and indicates that the DK50018 is in "programming mode".

4. Select the CV programming function (POM) in the control interface, application or hand control. (For more information on bit-by-bit CV programming, refer to the operating instructions of your control unit).

5. Now enter the value of 8 in the CV 8 to Reset the DK50018.

6. Exit the DK50018 "programming" mode by pressing the programming button again. The yellow LED will go off indicating that the programming mode is over. If not, the DK50018 will revert to programming mode.

7. Disconnect the power and channel signal terminals.

Caution: Wait about 30 seconds before powering up your DK50018 and restoring your settings.

The start address for the DK50018 is always assigned through a switch command, but never via CV 1!!! If CV 1 is written with an address, the decoder can no longer be programmed via locomotive address 9999!

Voeding
12 à 24V DC/AC

Minimaal
12V DC 3A

Yellow LED
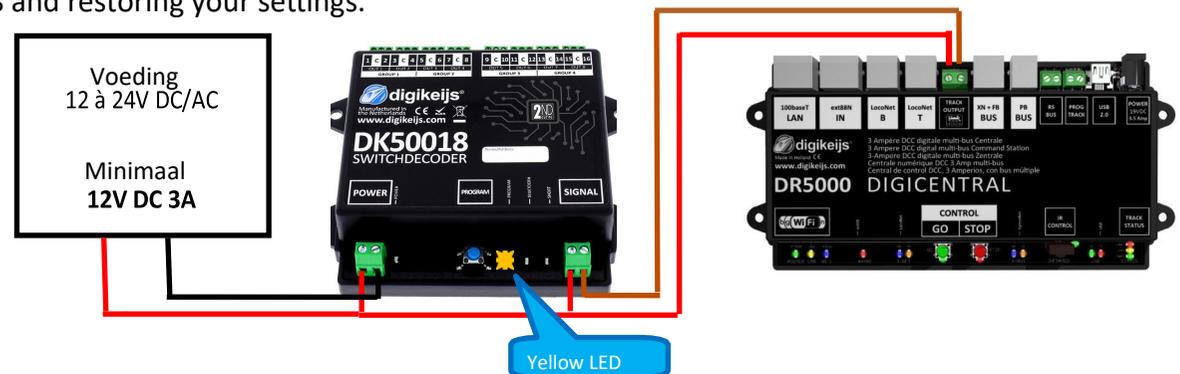
*:POM stands for Program On the Main and corresponds to the direct programming on the track or "track output" of the control unit.

5.0 Known issues

5.1 Program mode does not stay active

Some control units have the following problem:

when pressing the programming button on the DK50018, the yellow LED goes off again shortly after the programming mode has been activated and the DK50018 automatically terminates the programming mode. This happens only if the locomotive address 9999 has not been taken into account by the control unit. This can be easily bypassed by activating the locomotive address 9999 before pressing the programming button of the DK50018.
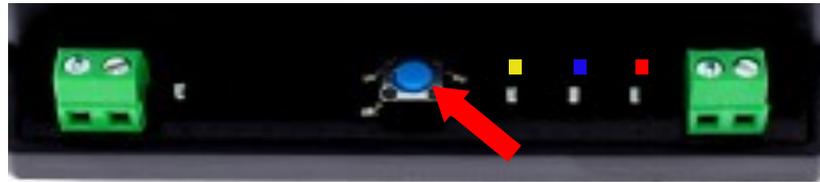
To prevent the red LED from going off, please use the following procedure for POM programming:

1. Set the locomotive address to 9999 (in DCC 128 steps) in your control unit or application.

2. Activate the locomotive with the above address in your control unit or application by switching the lights on/off (F0).

3. Press the programming button of the DK50018 only then, the LED must light up which means that the module is waiting for programming.

4. Now change the selected CV's via the POM mode to address 9999.

5. To exit the DK50018 "Programming" mode, press the button on the module again and the yellow LED on the decoder must go off, which means the modification has been saved.

5.1.1 Red LED lights up or flashes

If the red LED of the DK50018 lights up or flashes, it means you have a short circuit on one of the outputs (from OUT 1 to 16) and the module has therefore gone into safety and is protecting its outputs and the accessories connected to them. Check your wiring or detect the accessory that is causing the decoder to fail so that it can return to normal operation by disconnecting them all and then reconnecting them one after the other.

Solenoid point motors like the Peco Pl-10, PL11, PL-1000 and Seep PM-1, PM-2 should not be <u>directly connected </u> to the DK50018 as they draw to much current and this will damage the DK50018 and most likely your Point Motors.

Red LED

5.1.2 The DK50018 cannot be found through Bluetooth

It can sometimes happen that your DK50018 is not detected by the app. Please make sure the DK50018 has power and no other device is connected through bluetooth (blue led should be off). Close the app and restart the again and try to find the device again. Within the app their is also a refresh bluetooth option that can be used.

5.1.3 I need to unlock my DK50018

Within the Digikeijs APP you have have the option to lock or unlock the DK50018. This would mean if locked, other devices are not able to find the DK50018 through bluetooth. If for any reason you do not have acces to the app, lost your phone etc you can always reset the lock through CV programming.
To unlock the DK50018 and open up bluetooth broadcasting again please use CV 255 and value 0.

Update: when updated to firmware 1.0.6 It's now possible to do a full module reset by pressing the program button for 10 seconds

5.1.4 Issues in combination with the Z21 stations

~~We are currently doing a lot testing and making changes to fix compatibility issues with the Roco Z21 command stations. In the upcoming release a lot of issues will be fixed, for the time being you can still use the DK50018 in combination with the Z21 commands stations but please take note of the following~~

~~Within the Z21 maintenance tool please change the following settings~~

- ~~Deactivate Railcom~~

- ~~Activate the DCC turnout-addressing according RCN-213, if not then your addresses will change with +4 (default start address 1 will become 5)~~

- ~~Change Track signal type to DCC Only or MM Only~~

Update: Issues are solved when using the latest app version 1.0.6 and firmware 1.0.6