

# DR4018 Switching Decoder Instruction Manual



© Copyright 2005 – 2021 Digikeijs, the Netherlands. All rights reserved. No information, images or any part of this document may be copied without the prior written permission of Digikeijs.



# 1 General Information

<b>1</b>	<b>Index</b>		
1.0	General information	2	
1.2	Warranty and warranty conditions	3	
1.3	Legal information	3	
<b>2.0</b>	<b>Product overview</b>	<b>4</b>	
2.1	General product information	4	
2.2	Technical Specifications	4	
2.3	Hardware Overview	5	
<b>3.0</b>	<b>Programming</b>	<b>6</b>	
3.1	Programming the magnetic article address	7	
3.2	Programming CV's via POM (main track programming)	8	
3.3	Programming CV's on the Programming Track	9	
3.4	Resetting the DR4018 to Factory Defaults (main track POM programming)	10	
3.5	Resetting the DR4018 to Factory Defaults (programming track)	11	
3.6	Special feature CV programming for control panels which switch off the programming track	12	
3.7	Resetting the DR4018 to factory settings for Control panels which switch off the programming track	13	
<b>4.0</b>	<b>Programming examples with different Control panels</b>	<b>14</b>	
4.1	ROCO® Z21® / z21® Programming example Program start address	15	
4.2	ROCO® Z21® / z21® POM programming example	16	
4.3	ROCO® Multi-Mouse Programming Example Programming the start address	17	
4.4	ROCO® Multi-mouse POM Programming example	18	
4.5	Uhlenbrock® Intellibox® programming example Program start address	20	
4.6	Uhlenbrock® Intellibox® POM Programming Example	21	
4.7	LENZ® programming example start address prog.	23	
4.8	LENZ® POM programming example	24	
<b>5.0</b>	<b>Troubleshooting</b>	<b>26</b>	
5.1	The red LED goes out again even though the programming button was not pressed again.	26	
<b>6.0</b>	<b>Connection examples</b>	<b>27</b>	
6.1	Connection options Power and Signal Connection	27	
6.1	Connection examples with different Presets (Preset CV47)	28	
<b>7.0</b>	<b>CV Table</b>	<b>30</b>	
7.1	Switching groups Function mapping	34	
7.2	Signal Output (EXPERT) Function Mapping	35	
7.3	Pulse duration of the outputs	35	
7.4	Signal patterns of the integrated signal decoders	36	

### Please note!

This manual currently contains only the basic information and will be extended step by step. Suggestions, improvements, additions, comments or suggestions are always welcome.

[support@digikeijs.com](mailto:support@digikeijs.com)

## 1.2 Warranty and warranty conditions

All our products have a 24-month manufacturer's warranty. Read these operating instructions carefully.

Damage to the product caused by non-compliance with these instructions will void the warranty.

**ATTENTION:** The warranty is void if the housing of the product is opened.

## 1.3 Legal information

Printing errors and mistakes, technical or other changes as well as changes in the availability of individual products are expressly reserved.

Data and illustrations are non-binding. All changes to hardware, firmware and software are reserved.

We reserve the right to change the design of the product, software and/or firmware without prior notice.

### copyright

All Digikeijs manuals and other written instructions supplied and/or downloadable are copyrighted.

Duplication is not permitted without the written permission of Digikeijs.

## 2.0 Product overview

### 2.1 General product information

The DR4018 is a multiprotocol decoder that automatically detects DCC and MM. A rectifier is installed in the decoder so that the outputs always switch with **DC voltage (DC)**. With the function mapping via CV programming it is possible to realize all imaginable tasks.

The DR4018 can be configured to operate as a switching decoder with a **maximum of 16 separate** controllable switching outputs.

### 2.2 Technical specifications

The connection terminals for power and signal (track voltage) are designed for a cross-section of 0.5mm<sup>2</sup>. The terminals for Out 1-8 are designed for a cross-section of 0.34mm<sup>2</sup>. 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 DR4018 switches to minus (-).

	Number of Outputs	Protocol	Max. Load Out 1 - Out 8	Total current of all outputs	Power supply
<b>DR4018</b>	16x Output (Out 1 - Out 8)	DCC MM	2 A	3A	12-18V DC <b>Recommendation min. 12V DC 3A</b>

#### Note on 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 DR4018 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.

## 2.3 Hardware Overview

1	Connection <b>Out 1</b> 1 = - C = +	9	<b>Power Connection</b> Recommendation min. 12V DC 3A
2	Connection <b>Out 2</b> 3 = - C = +	10	<b>Green LED</b> Display Supply voltage present
3	Connection <b>Out 3</b> 5 = - C = +	11	<b>programming button</b>
4	Connection <b>Out 4</b> 7 = - C = +	12	<b>Red LED</b> Display programming mode (glows constantly) Display switching command is executed (lights up as long as movement is in
5	Connection <b>Out 5</b> 9 = - C = +	13	<b>Signal</b> (railway connection)
6	Connection <b>Out 6</b> 11 = - C = +		
7	Connection <b>Out 7</b> 13 = - C = +		
8	Connection <b>Out 8</b> 15 = - C = +		



## 3.0 Programming

### Basic information about programming the DR4018.

**Please pay attention to these points as otherwise the programming may fail or errors may occur.**

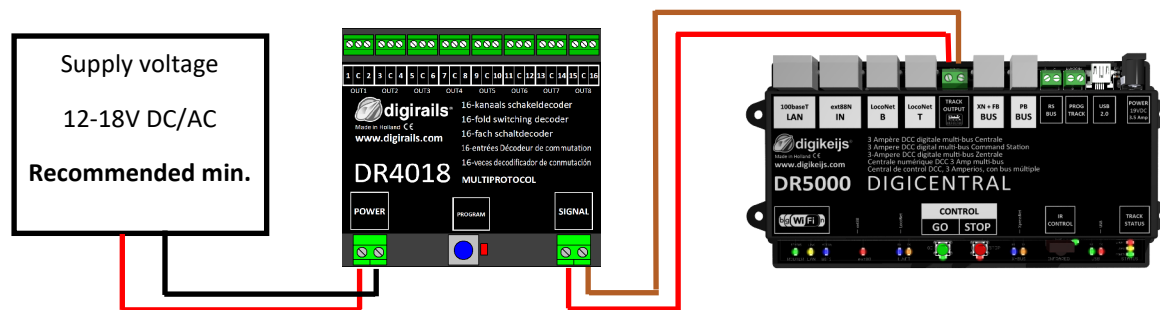
- CV programming is always possible on the programming track (if available). Some command stations switch off the programming track, which makes programming the DR4018 on the programming track somewhat more difficult.
- To read CV's on the programming track, the POWER and SIGNAL connections must be connected to the programming track of the central unit. In this case, please disconnect the external power supply at the DR4018.  
In addition, a resistor (150-270 Ohm) should be connected to "C" and terminal 1 of Out 1, otherwise no read confirmation can be detected by the central unit.
- POM programming is always possible on the main track.
- No changes to the DR4018 connections are necessary for POM programming.
- CV readout via POM or Railcom® is not possible.

## 3.1 Programming the turnout address

The turnout addresses are always assigned by a turnout command!!!

Make sure the DR4018 is powered from the decoder's power connector. It is best to use a switching power supply with at least 12V DC output voltage and 3A output power. The signal connection of the decoder must be connected to the main track output of your control panel!

1. Call up the desired magnetic article address which the DR4018 is to receive as the start address at the central unit, handset controller, app, etc.
2. Press the programming button on the DR4018, the red LED will light up continuously.  
The decoder is now in programming mode.
3. The next step is to switch the desired turnout address with the control panel, the app or the handset control.  
DR4018 as the start address.
4. The programming mode is automatically terminated after switching the turnout address.  
The red LED goes out again to indicate that the programming mode has been exited.
5. The DR4018 now occupies a maximum of 8 addresses starting with the first switched turnout address.



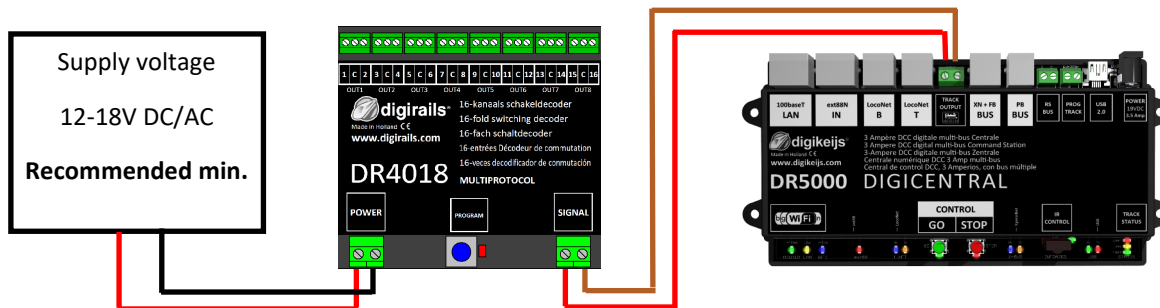
The **start address** (turnout address) for the DR4018 is always assigned via a **turnout command** and **not via the CV1!!!**

If the CV1 is nevertheless written with an address, the decoder can **no longer be programmed with the locomotive address 9999!**

## 3.2 Programming of CV's via POM (main track programming)

Make sure the DR4018 is powered from the decoder's power connector. The **green LED** next to the power connector must now light up permanently. It is best to use a switching power supply with at least 12V DC output voltage and 3A output power. The signal connection of the decoder must be connected to the main track output of your control panel! The DR4018 cannot be read out via Railcom®!

1. A locomotive with **address 9999** and **128 speed steps DCC** must be defined in the central unit, multi mouse, app etc..  
The DR4018 can be programmed similar to a locomotive decoder using this locomotive address.
2. Select the locomotive with the address 9999 at the central station, multi mouse, app, etc.  
Switch the function **F0** (light) on and off again to activate the locomotive in the control panel.
3. Press the programming button on the DR4018. The red LED is now lit continuously and indicates that the DR4018 is in "programming mode".
4. Select the CV Programming (POM) function in your control panel, app or handset.  
*(For further information on CV byte or CV bit programming, please refer to the operating instructions of your control panel)*
5. Now the desired CV value can be written to the DR4018 with the respective function Write POM of the central, app or handset controller.
6. An infinite number of CV's can be sent one after the other to the DR4018.
7. To exit the programming mode of the DR4018, the programming button must be pressed again.  
The red LED goes out and indicates that the programming mode has been terminated.



### Attention!!!

If for any reason the address 9999 required for programming has been changed in the DR4018, the reset must be carried out via the programming track, point 3.6.

The **start address** (turnout address) for the DR4018 is always assigned via a **turnout command** and **not via the CV1!!!**

If the CV1 is nevertheless written with an address, the decoder can **no longer be programmed with the locomotive address 9999!**



### 3.3 Programming of CV's via the programming track

Connect the signal and power connections of the DR4018 to the programming track connection of your control panel.

Please note that reading out and programming the DR4018 via the programming track only works if the central unit does not switch off the programming track!

Therefore, before attempting programming, check that the green LED next to the power connector is lit. Only if this is the case can the DR4018 be successfully programmed as described in this section. **If the green LED does not light up, refer to section 3.6 of this manual.**

1. Connect the resistor (150-270 Ohm) as shown below to "C" and terminal 1 of Out 1.
2. Connect the signal and power connections to the programming track of the control panel.
3. Now check whether the green LED next to the power connector is permanently lit.  
**If the green LED does not light up, refer to section 3.6 of this manual.**
4. A locomotive with **address 9999** and **128 speed steps DCC** must be defined in the central unit, multi mouse, app etc..  
The DR4018 can be programmed similar to a locomotive decoder using this locomotive address.
5. Select the locomotive with the address 9999 at the central station, multi mouse, app, etc.  
Switch the function **F0** (light) on and off again to activate the locomotive in the control panel.
6. Press the programming button on the DR4018. The red LED is now lit continuously and indicates that the DR4018 is in "programming mode".
7. Select the CV programming function via the programming track in your central, app or handset controller.  
*(For further information on CV byte or CV bit programming, please refer to the operating instructions of your control panel)*
8. Now the desired CV value can be written to or read from the DR4018 with the respective function of the central unit, app or handset controller.
9. An infinite number of CV's can be sent or read one after the other to the DR4018.
10. To exit the programming mode of the DR4018, the programming button must be pressed again.  
The red LED goes out and indicates that the programming mode has been terminated.



The **start address** (turnout address) for the DR4018 is always assigned via a **turnout command** and **not via the CV1!!!**

If the CV1 is nevertheless written with an address, the decoder can no longer be programmed with the locomotive address **9999!**

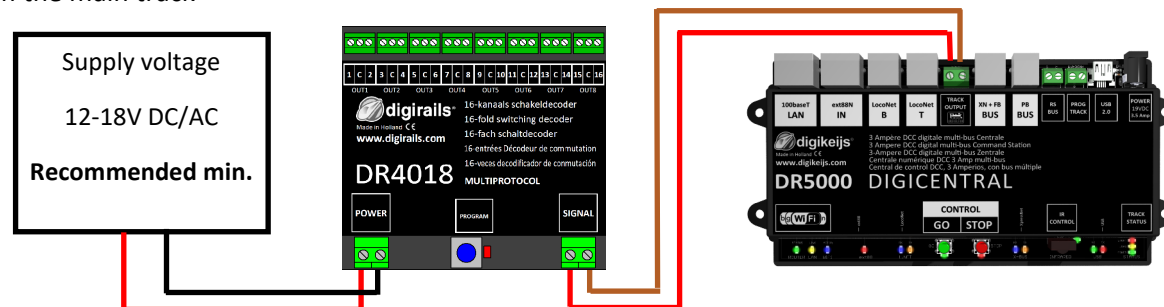
### 3.4 Reset DR4018 to Factory Settings (Main Track POM programming)

Connect the signal and power connectors of the DR4018 to the main track connector of your control panel. The **green LED** next to the power connector must now light up permanently. Alternatively, the power connection can also be supplied with an external power supply (min 12V DC 2A).

The DR4018 cannot be read out via Railcom®!

1. A locomotive with **address 9999** and **128 speed steps DCC** must be defined in the central unit, multi mouse, app etc.  
The DR4018 can be programmed similar to a locomotive decoder using this locomotive address.
2. Select the **locomotive** with the **address 9999** at the central station, multi mouse, app, etc.  
Switch the function **F0** (light) on and off again to activate the locomotive in the control panel.
3. Press the programming button on the DR4018. The red LED now lights up continuously and indicates that the DR4018 is in "programming mode".  
is located.
4. Select the CV Programming (POM) function in your control panel, app or handset.  
*(For further information on CV byte or CV bit programming, please refer to the operating instructions of your control panel)*
5. Now write the CV 8 with the decimal value 8 to reset the DR4018.
6. Exit the programming mode by pressing the programming button on the DR4018.  
The red LED goes out and indicates that the programming mode has been terminated.  
**Important!** Otherwise the DR4018 starts in programming mode again.
7. Now disconnect the power and signal connections from the main track

**Attention!** Wait approx. 30 seconds before powering the DR4018 again and restoring the siding.



The **start address** (turnout address) for the DR4018 is always assigned via a **turnout command** and **not via the CV1!!!**

If the CV1 is nevertheless written with an address, the decoder can **no longer be programmed with the locomotive address 9999!**

## 3.5 Reset DR4018 to Factory Settings (Programming Track)

The reset via the programming track should only be done if the reset via the POM programming did not work.

Connect the signal and power connections of the DR4018 to the programming track connection of your control panel.

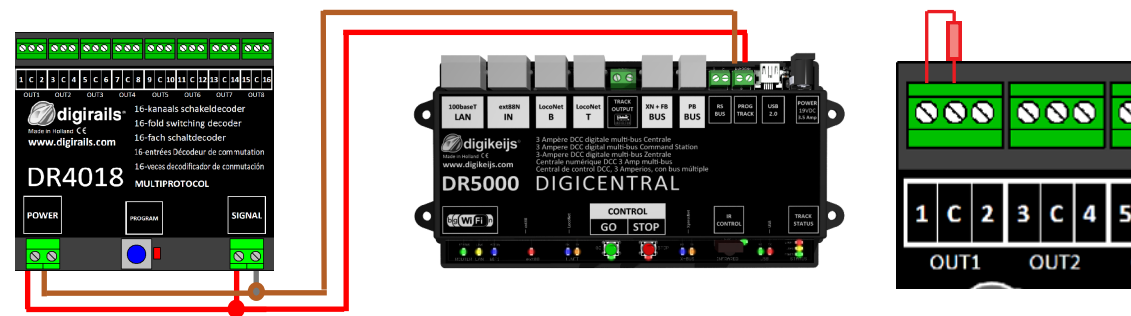
Please note that reading out and programming the DR4018 via the programming track only works if the central unit does not switch off the programming track!

Therefore, before attempting programming, check that the green LED next to the power connector is lit. Only if this is the case can the DR4018 be successfully programmed as described in this section. **If the green LED does not light up, refer to section 3.7 of this manual.**

1. Connect the resistor (150-270 Ohm) as shown below to "C" and terminal 1 of Out 1.
2. Connect the signal and power connections to the programming track of the control panel.
3. Now check whether the green LED next to the power connector is permanently lit.  
**If the green LED does not light up, refer to section 3.7 of this manual.**
4. Press the programming button on the DR4018. The red LED now lights up continuously and indicates that the DR4018 is in "programming mode".  
is located.
5. Select the CV programming function via the programming track in your central, app or handset controller.  
*(For further information on CV byte or CV bit programming, please refer to the operating instructions of your control panel)*
6. Now write the CV 8 with the decimal value 8 to reset the DR4018.
7. Exit the programming mode by pressing the programming button on the DR4018.  
The red LED goes out and indicates that the programming mode has been terminated.  
**Important!** Otherwise the DR4018 will restart in programming mode.
8. Now disconnect the power and signal connections from the programming track.

**Attention!** Wait approx. 30 seconds before powering the DR4018 again and restoring the siding.

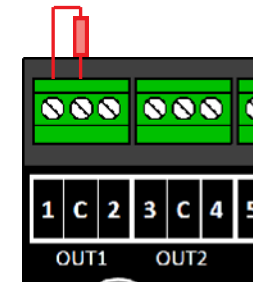
The DR4018 is now reset to factory settings. The POM address was reset to 9999 again and the DR4018 has the magnetic article address 1 again. By switching the magnetic article address 1 it can be checked whether the RESET was successful.



## 3.6 Special feature CV programming for control panels that Switch off the programming track

Some control panels (Uhlenbrock® Basis®, Daisy 2® Startset, Piko® SmartControl® light, etc.) only switch on the supply voltage to the programming track during programming. The **green LED** next to the power connector of the DR4018 indicates whether the programming track always outputs voltage. If this does not light up continuously, the programming track is switched off. This leads to the DR4018 requiring a different programming or re-setting procedure than usual. This procedure is described in this section.

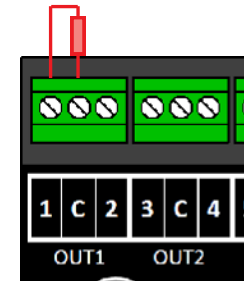
- Now that you have determined that the **green LED** next to the power connector is not permanently lit, disconnect the **POWER** and **SIGNAL** connectors from the **programming track**.
- Connect the resistor (150-270 Ohm), as shown, to "C" and terminal 1 of Out 1.
- Connect the **POWER** and **SIGNAL** connectors to **the main track** of your control panel. Now the **green LED** next to the POWER connector should light up permanently.
- Now press the programming button on the DR4018. The **red LED** will light to indicate that the DR4018 is in programming mode
- Now disconnect the **POWER and SIGNAL** connectors from the **main track** (Track Out).
- Now reconnect the **POWER and SIGNAL** connections to the **programming track** of your control panel. The **green** and **red** LEDs now go out because the **programming track** is not constantly supplied with power. The programming mode of the DR4018 remains unchanged.
- Select the CV programming function via the **programming track** in your central, app or handset controller and program the desired CVs one after the other.  
*(Further information on CV byte or CV bit programming can be found in the operating manual of your control panel)*  
After you have successfully changed all desired CV's, you must exit the programming mode of the central unit before proceeding with the next step.
- Disconnect the **POWER and SIGNAL** connections from the **programming track**.
- Connect the **POWER and SIGNAL** connectors to the main track of your control panel. Now the **green LED** next to the POWER connector and the **red LED** both light up again. The **red LED** indicates that the DR4018 is still in programming mode.
- Now press the programming buttons on the DR4018. The **red LED** goes out and the programming mode is terminated.



### 3.7 Reset DR4018 to factory settings for control units that switch off the programming track

Some control panels (Uhlenbrock® Basis®, Daisy 2® Startset, Piko® SmartControl® light, etc.) only switch on the supply voltage to the programming track during programming. The **green LED** next to the power connector of the DR4018 indicates whether the programming track always outputs voltage. If this does not light up continuously, the programming track is switched off. This leads to the DR4018 requiring a different programming or resetting procedure than usual. This procedure is described in this section.

1. Now that you have determined that the **green LED** next to the power connector is not permanently lit, disconnect the POWER **and** SIGNAL connectors from the programming track.
2. Connect the resistor (150-270 Ohm), as shown, to "C" and terminal 1 of Out 1.
3. Connect the POWER **and** SIGNAL connectors to the main track of your control panel.  
Now the **green LED** next to the POWER connector should light up permanently.
4. Now press the programming button on the DR4018.  
The **red LED** will light to indicate that the DR4018 is in programming mode.
5. Now disconnect the POWER **and** SIGNAL connectors from the **main track** (Track Out).
6. Now reconnect the POWER **and** SIGNAL connections to the **programming track** of your control panel.  
The **green** and **red LEDs** now go out because the programming track is not constantly supplied with power.  
The programming mode of the DR4018 remains unchanged.
7. Select the CV programming function via the **programming track** in your central, app or handset controller.  
*(Further information on CV byte or CV bit programming can be found in the operating manual of your control panel)*  
To reset to factory settings, the decimal value 8 must be written to CV8.  
After you have described the CV 8, you must exit the **programming mode** of the central unit before proceeding with the next step.
8. Disconnect the POWER **and** SIGNAL connections from the **programming track**.
9. Connect the POWER **and** SIGNAL connectors to the **main track** of your control panel.  
Now the **green LED** next to the POWER connector and the **red LED** both light up again.  
The red LED indicates that the DR4018 is still in programming mode.
10. Now press the programming buttons on the DR4018. The **red LED** goes out and the programming mode is terminated.
11. **Attention!** Now disconnect the POWER **and** SIGNAL connections from the **main track** of the control panel.  
This is absolutely necessary to successfully complete the RESET. After approx. 30 seconds the desired connection can be restored.



The DR4018 is now reset to factory settings. The POM address was reset to 9999 again and the DR4018 has the magnetic article address 1 again. By switching the magnetic article address 1 it can be checked whether the RESET was successful.

## 4.0 Programming examples with different Control Panels

**Please note that it is impossible to create individual programming instructions for all control panels.**

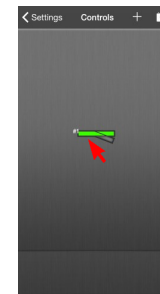
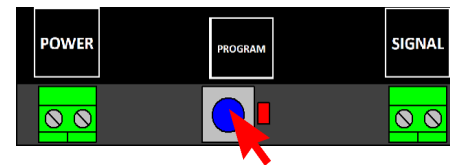
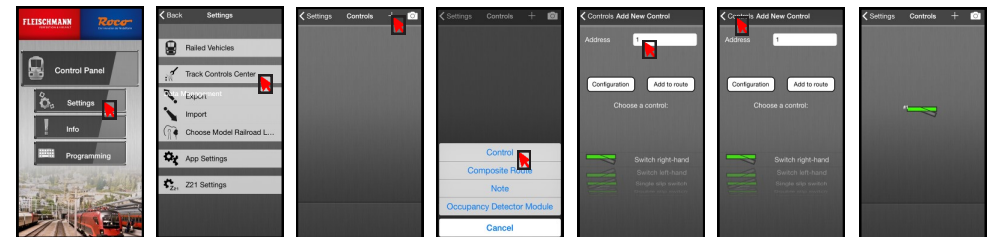
On the following pages only an overview of the procedure is possible.

## 4.1 ROCO® Z21® / z21® Programming example Program start address



### Programming the start address (OUT1)

1. Connect the DR4018 to the main track of your z21®/Z21®.
2. Create a turnout with the desired start address in the Z21 app.
3. Press the programming button on the DR4018 once.  
The red LED lights up.
4. Press the switch symbol once.  
The red LED on the DR4018 extinguishes and the switched turnout address is stored as start address (OUT1).



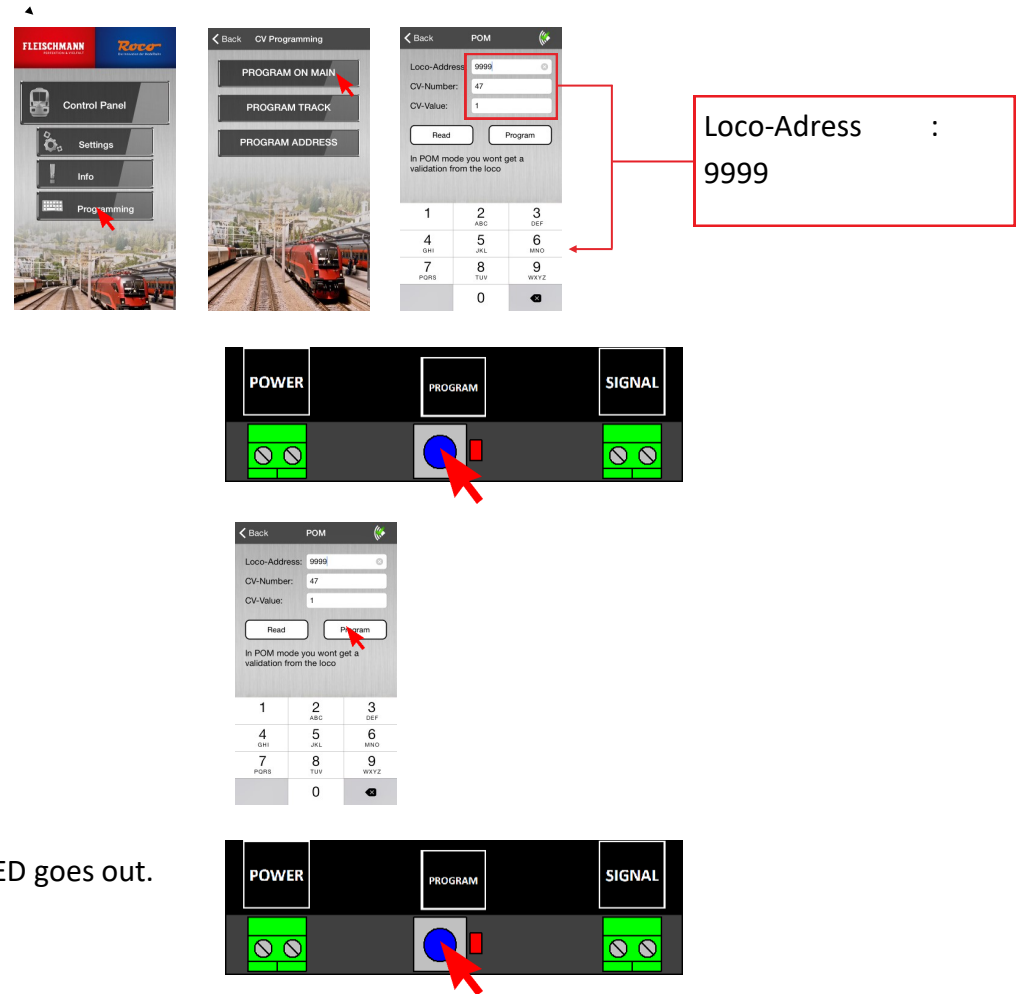
Please also note point 3.1 of this manual!

## 4.2 ROCO® Z21® / z21® POM Programming example

CV programming via POM (Program On Main)

In this example we program the DR4018 via CV47 to preset 1.

1. Connect the DR4018 to the main track of your z21®/Z21®.
2. Open the CV programming of the Z21® App.
3. Press the programming button on the DR4018 once.  
The red LED lights up.
4. Press the "Program" key in the Z21® App.
5. Press the programming button on the DR4018 once. The red LED goes out.  
The DR4018 will now save and accept the settings you have made.  
The changes to the programmed settings are immediately active.



Loco-Address : 9999

Please also note point 3.1 of this manual!



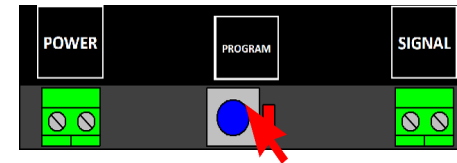
## 4.3 ROCO® Multi-mouse programming example Program start address

### Programming the start address (OUT1)

1. Verbinden Sie den DR4018 mit dem 'Main Track' / 'Track out' Ihrer Multimaus.
2. Wählen Sie die gewünschte Weichenadresse aus die der DR4018 als Startadresse kommen soll.



3. Press the programming button on the DR4018 once.  
The red LED lights up.

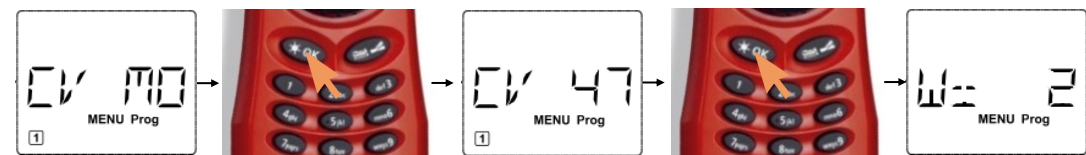
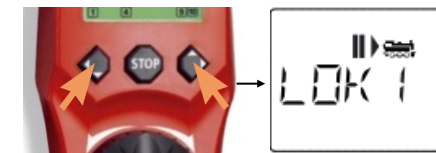


Please also note point 3.1 of this manual!

## 4.4 ROCO® Multi-mouse POM Programming example

### CV programming via POM (Program On Main)

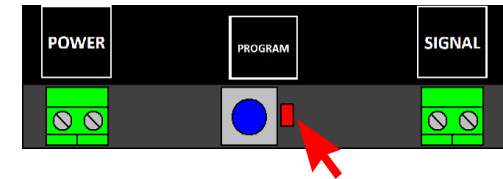
1. Connect the DR4018 to the 'Main Track' / 'Track out' of your multi mouse.
2. Create a new locomotive in the Multimaouse with locomotive address 9999
3. Enter a locomotive name e.g. "LOK1". Then press "OK".
4. Select the locomotive you just created.
5. Press the "Arrow" and "Menu" buttons simultaneously to enter the programming menu.
6. Press the OK button again and enter the desired CV value.



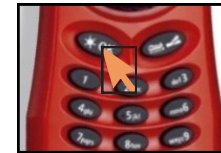
Items 7 to 9 on page 19

Please also note point 3.1 of this manual!

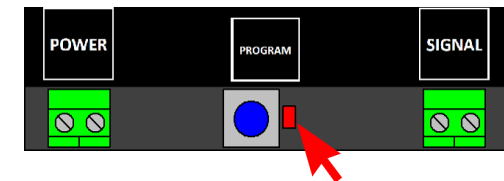
7. Press the programming button on the DR4018 once.  
The red LED lights up.



8. You can now send the programming command by pressing 'OK' again.

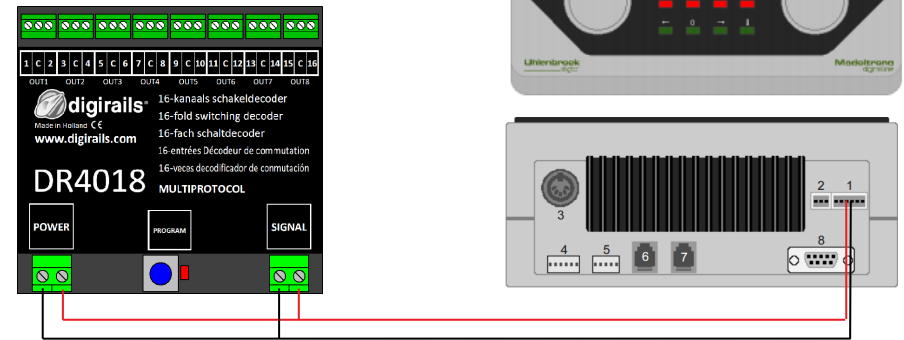


9. To exit the programming mode, press the programming button on the DR4018 again.  
The red LED goes out and the changes are saved.



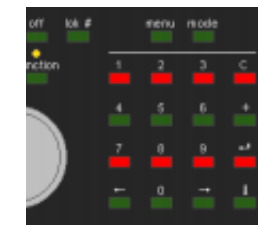
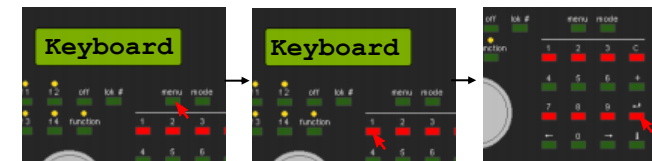
Please also note point 3.1 of this manual!

## 4.5 Uhlenbrock® Intellibox® Programming example Program start address



### Programming the start address (OUT1)

1. Connect the DR4018 to the main track of your Intellibox®.
2. Select 'Keyboard Mode' on the Intellibox® by pressing the [mode] key. until 'keyboard' appears in the display.
3. Select the desired start address by pressing the [menu] key.
4. Press the programming button on the DR4018 once. The red LED lights up.
5. Switch the desired address on your Intellibox® once. The red LED on the DR4018 goes out as soon as the module has received the correct address.

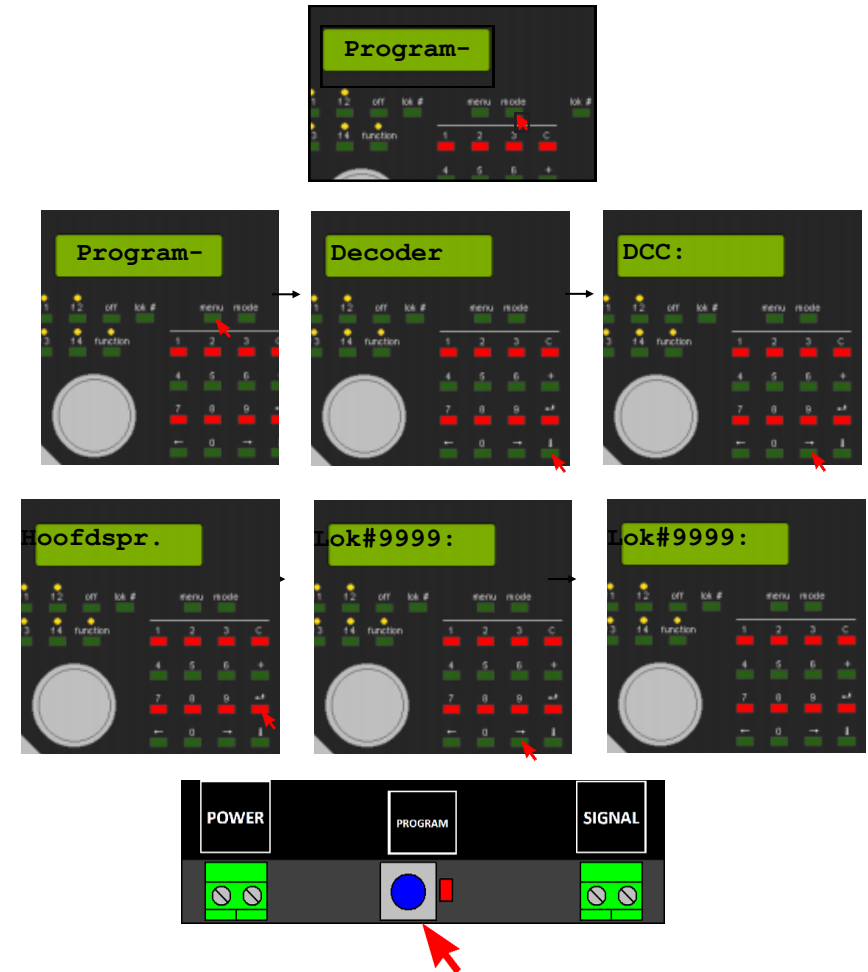


Please also note point 3.1 of this manual!

## 4.6 Uhlenbrock® Intellibox® POM Programming example

### CV programming via POM (Program On Main)

1. Connect the DR4018 to the main track of your Intellibox®.
2. Set the Intellibox to the "Programming Mode" by pressing the [mode] key.  
Until "programming mode" appears on the display.
3. Press the [menu] key and select the option DCC Program -> DCC Program.  
DCC program ->. Main track Prog.
4. Enter the address '9999' and press the [enter] key.  
Call the CV value 47 and press the right[->] key.  
Now enter the value 2 (default setting 2).
5. Press the programming button of the DR4018 once.  
The red LED lights up.



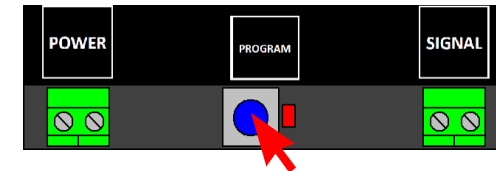
Items 6 and 7 on page 22

Please also note point 3.1 of this manual!

6. Press the [Enter] key to send the desired CV value to the DR4018.

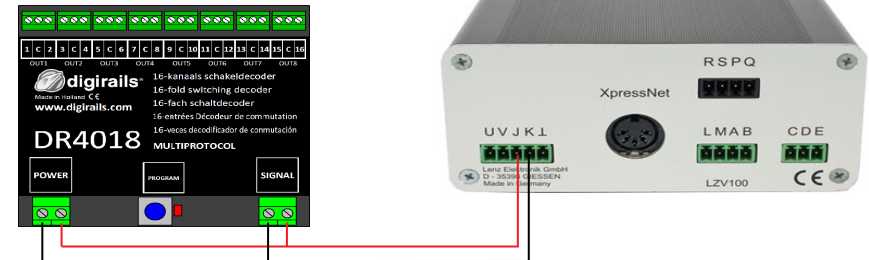


7. To exit the programming mode, press the programming button on the DR4018. The red LED goes out and the changes are saved.



Please also note point 3.1 of this manual!

## 4.7 LENZ® Programming example Program start address



### Programming the start address (OUT1)

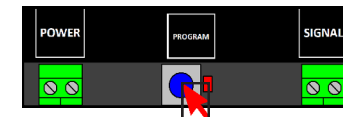
1. Connect the DR4018 to the J and K output (main track) of your LZV100 central station.
2. Press [F] until [\* B&W \*] appears on the LH100 screen. Then press [ENTER].  
Enter the desired turnout address and press [ENTER] again.



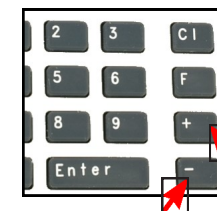
3. The selected turnout address now appears on the screen.



4. Press the programming button on the DR4018 once.  
The red LED lights up.



5. Switch the turnout address using the [+] and [-] keys on the LH100.  
The red LED on the DR4018 extinguishes and the switched turnout address is stored as start address (OUT1).

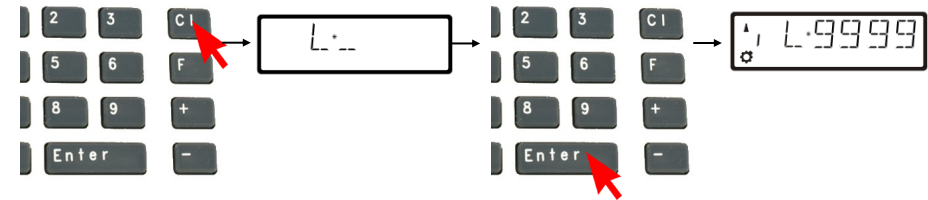


Please also note point 3.1 of this manual!

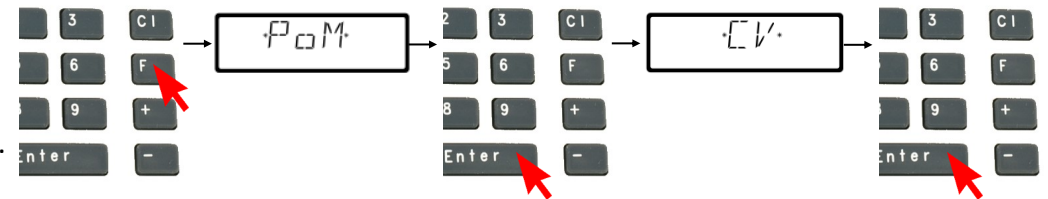
## 4.8 LENZ® POM Programming example

### CV programming via POM (Programm On Main)

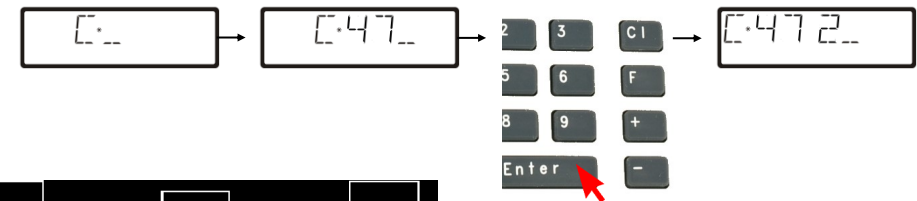
1. Connect the DR4018 to the J and K outputs (main track) of your LZV100 central.
2. Press the [ CI ] key and enter the locomotive address '9999'. Then press [ENTER].



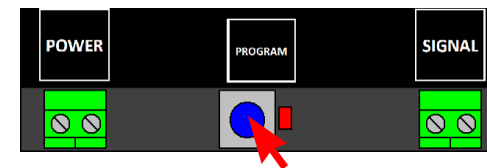
3. Now press the [ F ] key until the \*PoM\* option appears on the display. Then press [ENTER] until \*CV\* appears. Press [ENTER].



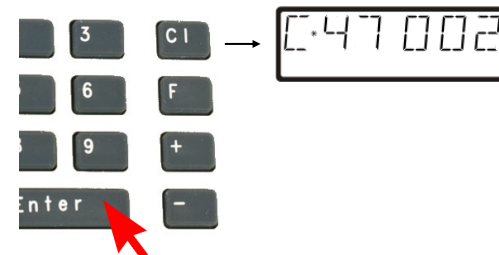
4. Enter the CV number you want to change and press [ENTER].



5. Drücken Sie die Programmierstaste am DR4018 einmal. Die rote LED leuchtet.



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

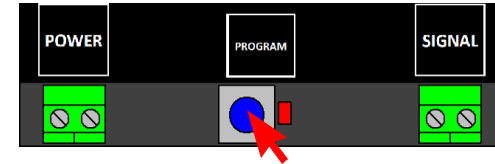


Please also note point 3.1 of this manual!

Item 7  
on



7. To exit the programming mode, press the programming button of the DR4018 again.  
The red LED goes out and the changes are saved.



Please also note point 3.1 of this manual!

## 5.0 Troubleshooting and others

### 5.1 The red LED goes out again although the programming button has not been pressed again.

Some central units have the problem that after pressing the programming button of the DR4018, the red LED goes out again shortly after the programming mode has been activated and the DR4018 automatically terminates the programming mode.

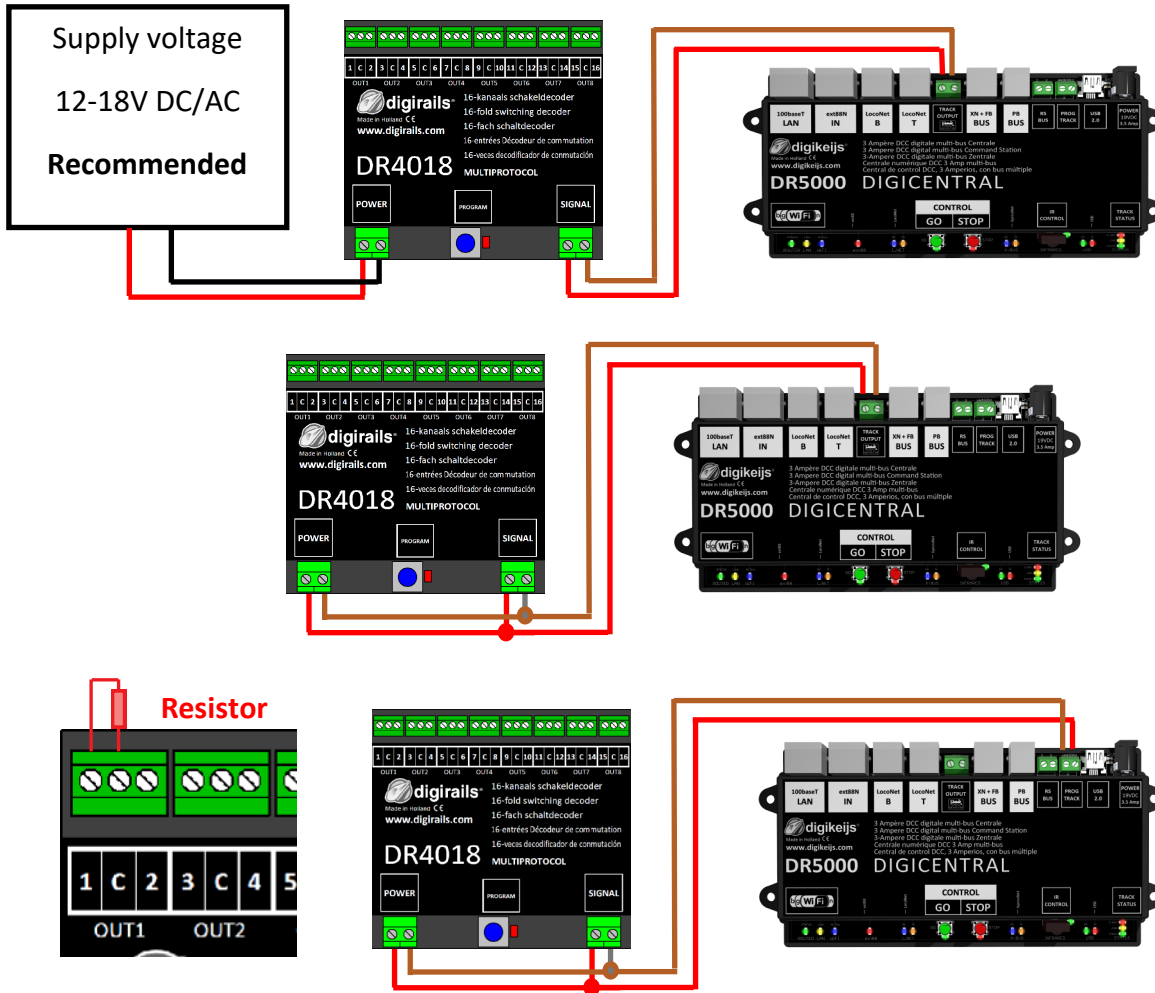
This happens if the locomotive with the address 9999 has not yet been activated in the central station. This can be easily avoided by always "activating" "the locomotive" with the address 9999 before pressing the programming button of the DR4018.

**In order to avoid the red LED extinguishing, please observe the following procedure for POM programming:**

1. Define a locomotive with locomotive address 9999 (DCC, 128 speed steps) in the central/multi mouse or app.
2. Activate the "locomotive" with address 9999 in the control panel by switching the lighting on and off again (F0) .
3. Press the programming button on the DR4018 only now. The red LED will now glow continuously to indicate that the DR4018 is in the programming mode.
4. Now start to change the desired CV's via POM (locomotive address 9999).
5. To exit the programming mode of the DR4018, the programming button must be pressed again. The red LED goes out and indicates that the programming mode has been terminated.

## 6.0 Connection examples

### 6.1 Connection options Power and signal Connection



Signal Connection to **main track**

Power Connection to an **external power supply**

Recommended for **normal operation** and for the **POM** programming

Signal Connection to **main track**

Power Connection to **main track**

Alternative to connecting an external power supply.  
Suitable for **normal operation** and for the **POM**

Signal Connection to **programming track**

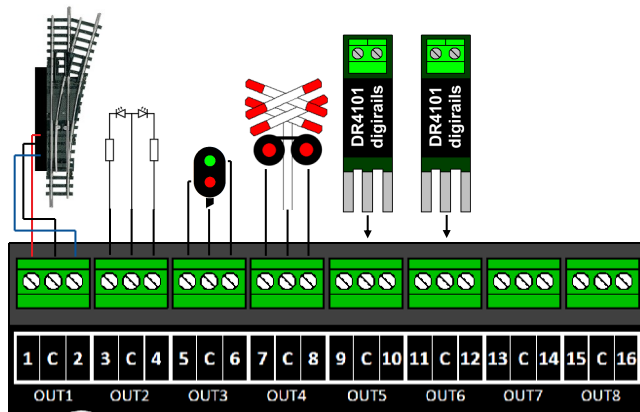
Power Connection to **programming track**

Resistor between "C" and 1 (Out 1) (150-270 Ohm)

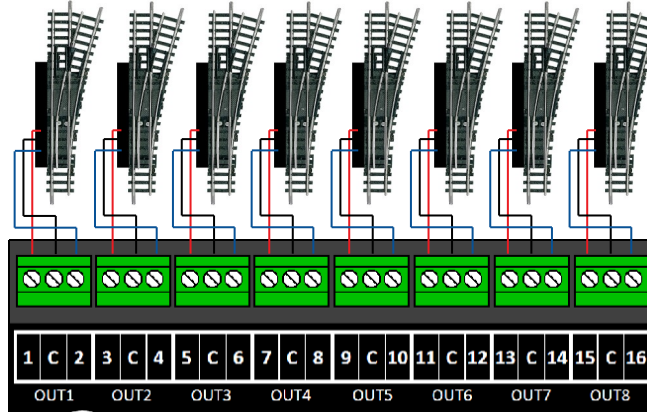
The **resistor** is necessary for **reading** and **writing CV's** on

## 6.2 Connection examples with different presets (Preset CV47)

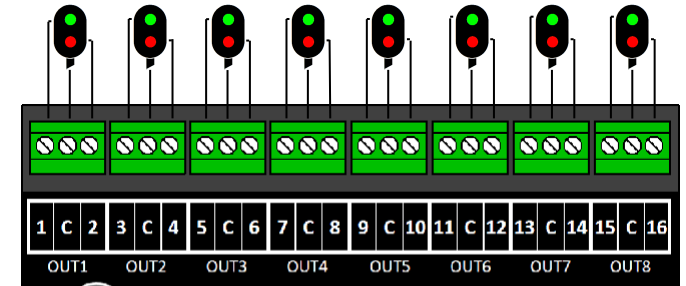
The DR4018 can be easily parameterized for various switching tasks using the presets. These default settings are always made in CV 47.



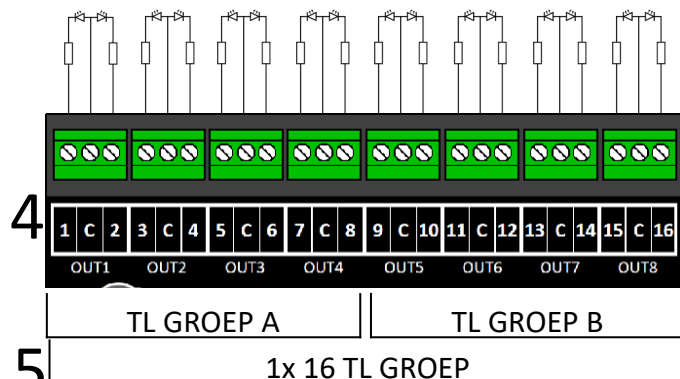
0 1 2 3 6 13  
PRESET



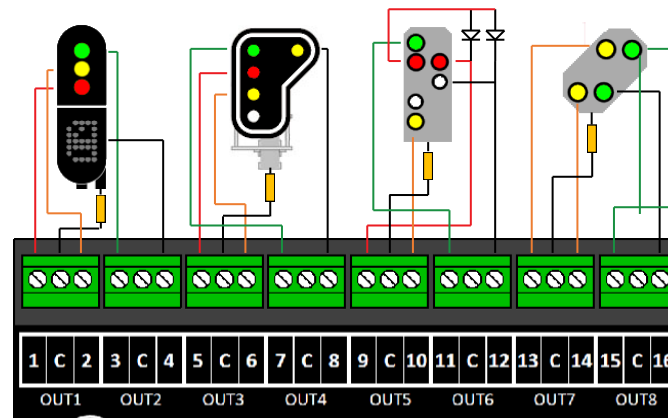
PRESET 0



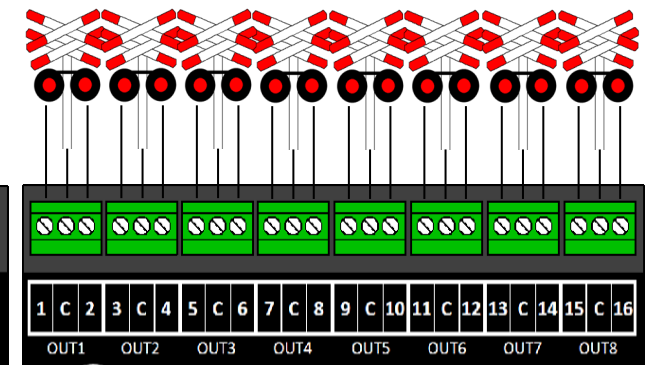
PRESET 2



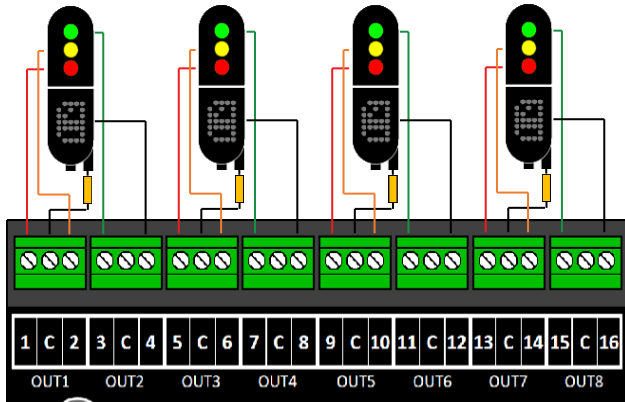
PRESET 4 & 5



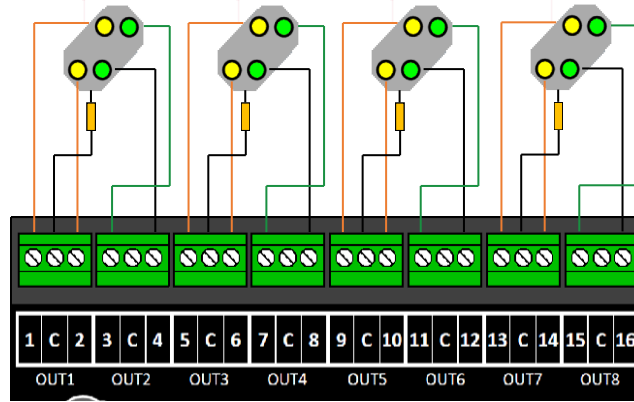
PRESET



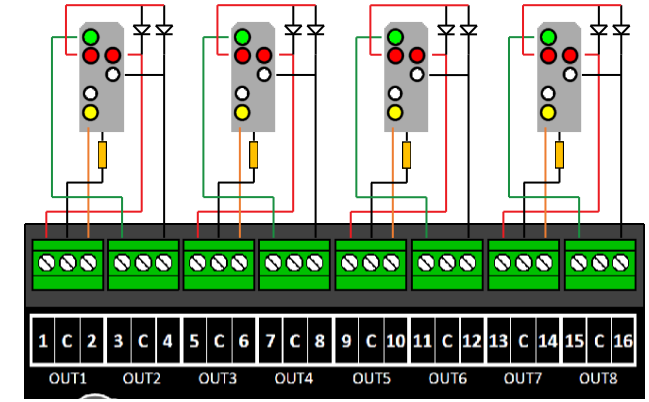
PRESET 3



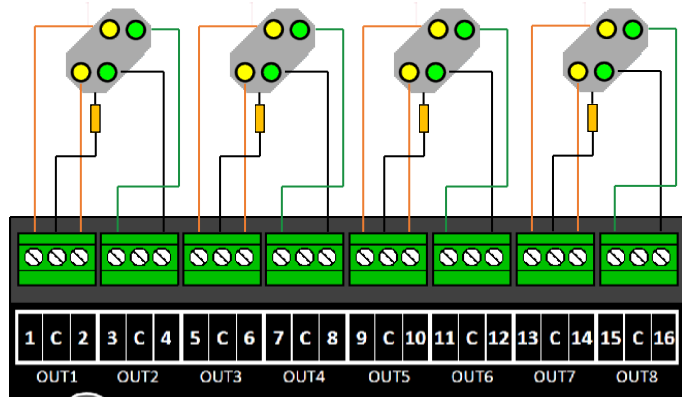
PRESET 7



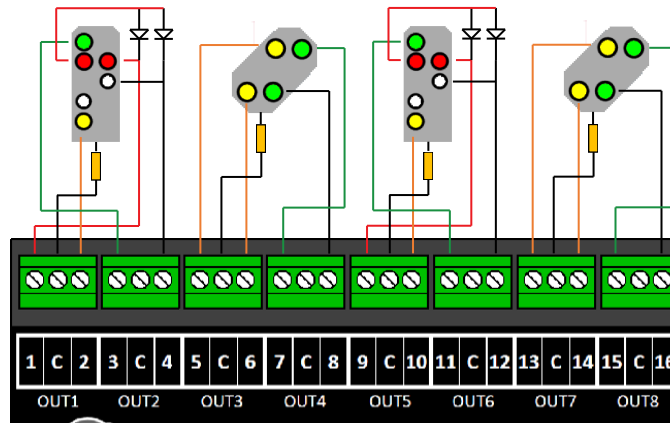
PRESET 11



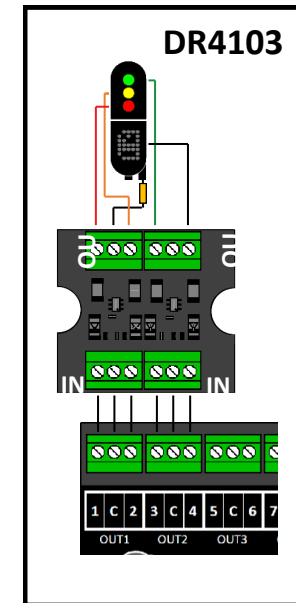
PRESET 8



PRESET 9



PRESET 10



## 7.0 CV Table

CV	CV Definition	Range	Value								
7	<b><u>Decoder Version</u></b>		13								
8	<b><u>Manufacturer</u></b> ID value '8' resets the decoder to factory settings.		42								
17	<b><u>Long address</u></b> high byte	192-255	231								
18	<b><u>Long address</u></b> low byte	0-255	15								
29	<b><u>Configuration Data</u></b>		98								
	<table border="1"> <thead> <tr> <th>Bit</th> <th>Function</th> <th>Standard</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>"0" = one-byte addressing (address in CV1), "1" = two-byte addressing (also called detailed addressing, address in CV17 and 18)</td> <td>"0"</td> <td>32</td> </tr> </tbody> </table>	Bit	Function	Standard	Value	5	"0" = one-byte addressing (address in CV1), "1" = two-byte addressing (also called detailed addressing, address in CV17 and 18)	"0"	32		
Bit	Function	Standard	Value								
5	"0" = one-byte addressing (address in CV1), "1" = two-byte addressing (also called detailed addressing, address in CV17 and 18)	"0"	32								

CV	CV Definition	Range	Value
47	<b>Presets / Presets 0-13</b> (This CV can only be written. Reading is not possible!)	0 – 13	0

The DR4018 switching decoder has 13 possible presets to make programming easier.

Of course, the individual CVs of the presets can also be adjusted individually.

Preset	Funktion	Value	Number of addresses that are preset turn
0	8x Turnout with twin-coil motor	0	8
1	16x permanent on/off switch	1	16
2	8x two-light signal with fade effect	2	8
3	8x AHOB	3	8
4	2 groups with 8x Fluorescent lamp	4	2
5	1 x 16 output with Fluorescent lamp	5	1
6	8x Turnout motor control	6	8
7	4x Dutch three-light signal	7	16
8	4x DB Main signal	8	16
9	4x DB pre-signal associated with main signal	9	16
10	2x Combination of DB Main signal and pre-signal	10	8
11	4x DB Pre-signal	11	16
12	4x NMBS Main signal	12	16
13	8x Turnout control with time limit	13	8

CV	CV Definition	Range	Value																								
107	<b>Dark time</b> between the different signal transitions (only for DB signals)	1-255	70																								
108	Values for dimming the signals (night mode)	0-15	10																								
109	<b>PWM period</b> The resolution with which the internal PWM works to achieve effects and dimming values.	1-255	14																								
111	<b>Fade speed</b> The speed at which the outputs configured for the thread are fed and unfed.	1-255	3																								
112	<b>Flashing speed</b> The speed at which the outputs configured for flashing will flash.	1-255	183																								
113	<b>Output configuration Output 1</b>	0-255	143																								
	<table border="1"> <thead> <tr> <th>Bit</th> <th>Function</th> <th>Standard</th> <th>Wert</th> </tr> </thead> <tbody> <tr> <td>0 - 3</td> <td><b>Light intensity/dimmer</b> "0" = completely off, "15" = maximum light intensity.</td> <td>15</td> <td>0-15</td> </tr> <tr> <td>4</td> <td><b>Fade-in and fade-out effect.</b> "0" = Fading switched off. "1" = Fading switched on. Fade speed is controlled in CV111.</td> <td>0</td> <td>16</td> </tr> <tr> <td>5</td> <td><b>Flashing effect.</b> "0" = flashing switched off. "1" = flashing on. Blinking speed is controlled in CV112.</td> <td>0</td> <td>32</td> </tr> <tr> <td>6</td> <td><b>Random effect.</b> "0" = random effect switched off. "1" = random effect switched on. When combined with bit 4 (fade), the lamps flicker and then gradually fade in (gas lamp effect). Important: The light intensity (Bit 0-3) must not exceed 14.</td> <td>0</td> <td>64</td> </tr> <tr> <td>7</td> <td><b>Pulse mode.</b> Time is set in CV121 to 128, if combined with bit 5 the output flashes in the opposite phase.</td> <td>1</td> <td>128</td> </tr> </tbody> </table>	Bit	Function	Standard	Wert	0 - 3	<b>Light intensity/dimmer</b> "0" = completely off, "15" = maximum light intensity.	15	0-15	4	<b>Fade-in and fade-out effect.</b> "0" = Fading switched off. "1" = Fading switched on. Fade speed is controlled in CV111.	0	16	5	<b>Flashing effect.</b> "0" = flashing switched off. "1" = flashing on. Blinking speed is controlled in CV112.	0	32	6	<b>Random effect.</b> "0" = random effect switched off. "1" = random effect switched on. When combined with bit 4 (fade), the lamps flicker and then gradually fade in (gas lamp effect). Important: The light intensity (Bit 0-3) must not exceed 14.	0	64	7	<b>Pulse mode.</b> Time is set in CV121 to 128, if combined with bit 5 the output flashes in the opposite phase.	1	128		
Bit	Function	Standard	Wert																								
0 - 3	<b>Light intensity/dimmer</b> "0" = completely off, "15" = maximum light intensity.	15	0-15																								
4	<b>Fade-in and fade-out effect.</b> "0" = Fading switched off. "1" = Fading switched on. Fade speed is controlled in CV111.	0	16																								
5	<b>Flashing effect.</b> "0" = flashing switched off. "1" = flashing on. Blinking speed is controlled in CV112.	0	32																								
6	<b>Random effect.</b> "0" = random effect switched off. "1" = random effect switched on. When combined with bit 4 (fade), the lamps flicker and then gradually fade in (gas lamp effect). Important: The light intensity (Bit 0-3) must not exceed 14.	0	64																								
7	<b>Pulse mode.</b> Time is set in CV121 to 128, if combined with bit 5 the output flashes in the opposite phase.	1	128																								
114	<b>Output configuration Output 2</b> (See CV113 for Configuration)	0-255	143																								
115	<b>Output configuration Output 3</b> (See CV113 for Configuration)	0-255	143																								
116	<b>Output configuration Output 4</b> (See CV113 for Configuration)	0-255	143																								
117	<b>Output configuration Output 5</b> (See CV113 for Configuration)	0-255	143																								



CV	CV Definition	Range	Value														
118	Output configuration Output 6 (See CV113 for Configuration)	0-255	143														
119	Output configuration Output 7 (See CV113 for Configuration)	0-255	143														
120	Output configuration Output 8 (See CV113 for Configuration)	0-255	143														
121	Output configuration Output 9 (See CV113 for Configuration)	0-255	143														
122	Output configuration Output 10 (See CV113 for Configuration)	0-255	143														
123	Output configuration Output 11 (See CV113 for Configuration)	0-255	143														
124	Output configuration Output 12 (See CV113 for Configuration)	0-255	143														
125	Output configuration Output 13 (See CV113 for Configuration)	0-255	143														
126	Output configuration Output 14 (See CV113 for Configuration)	0-255	143														
127	Output configuration Output 15 (See CV113 for Configuration)	0-255	143														
128	Output configuration Output 16 (See CV113 for Configuration)	0-255	143														
131	Signal 1, Configuration <b>OUT 1-4 in connection with CV 143 (page 35 chapter 7.2)</b> If these CVs contain a value other than 0, all outputs switch in accordance with the signal rules. The other CVs that normally control the outputs will be disabled.	0-5	0-5														
	<table border="1"> <thead> <tr> <th>Value</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>No Signal</td> </tr> <tr> <td>1</td> <td>NS (Dutch)</td> </tr> <tr> <td>2</td> <td>DB_HP (German main signal)</td> </tr> <tr> <td>3</td> <td>DB_VRHP (German pre- and main signal)</td> </tr> <tr> <td>4</td> <td>DB_VR (German pre signal)</td> </tr> <tr> <td>5</td> <td>NMBS (Belgian Railway)</td> </tr> </tbody> </table>	Value	Function	0	No Signal	1	NS (Dutch)	2	DB_HP (German main signal)	3	DB_VRHP (German pre- and main signal)	4	DB_VR (German pre signal)	5	NMBS (Belgian Railway)		
Value	Function																
0	No Signal																
1	NS (Dutch)																
2	DB_HP (German main signal)																
3	DB_VRHP (German pre- and main signal)																
4	DB_VR (German pre signal)																
5	NMBS (Belgian Railway)																
132	Signal 2, Configuration <b>OUT 5-8 in connection with CV 143 (page 35 chapter 7.2)</b>	0-5	0-5														
133	Signal 3, Configuration <b>OUT 9-12 in connection with CV 143 (page 35 chapter 7.2)</b>	0-5	0-5														
134	Signal 4, Konfiguration <b>OUT 13-16 in connection with CV 143 (page 35 chapter 7.2)</b>	0-5	0-5														

## 7.1 Vector groups Function mapping

The following table shows how you can link the various outputs of the DR4018 module (1-16) with the turnout control panel of your control panel. This can be useful if you want to switch several outputs simultaneously via one key. If you want to switch several outputs in a group with one function key, then add the values.

**Example 1 (grey):** Key 1 is to activate switching outputs 2 and 5 if the status is ON.  
You program: CV141 values 2 + 16 = 18.

**Example 2 (black):** Key 10 is to activate switching outputs 1 and 15 when the status is ON.  
You program: CV195 value 1 and CV196 value

	Status	CV (A)	CV (B)	OUTPUT GROUP A ( 1 bis 8 ) und GROUP B ( 9 bis 16 )							
				1   9	2   10	3   11	4   12	5   13	6   14	7   15	8   16
Button 1	ON	141	142	1	2	4	8	16	32	64	128
	OFF	144	145	1	2	4	8	16	32	64	128
Button 2	ON	147	148	1	2	4	8	16	32	64	128
	OFF	150	151	1	2	4	8	16	32	64	128
Button 3	ON	153	154	1	2	4	8	16	32	64	128
	OFF	156	157	1	2	4	8	16	32	64	128
Button 4	ON	159	160	1	2	4	8	16	32	64	128
	OFF	162	163	1	2	4	8	16	23	64	128
Button 5	ON	165	166	1	2	4	8	16	32	64	128
	OFF	168	169	1	2	4	8	16	32	64	128
Button 6	ON	171	172	1	2	4	8	16	32	64	128
	OFF	174	175	1	2	4	8	16	32	64	128
Button 7	ON	177	178	1	2	4	8	16	32	64	128
	OFF	180	181	1	2	4	8	16	32	64	128
Button 8	ON	183	184	1	2	4	8	16	32	64	128
	OFF	186	187	1	2	4	8	16	32	64	128
Button 9	ON	189	190	1	2	4	8	16	32	64	128
	OFF	192	193	1	2	4	8	16	32	64	128
Button 10	ON	195	196	1	2	4	8	16	32	64	128
	OFF	198	199	1	2	4	8	16	32	64	128
Button 11	ON	201	202	1	2	4	8	16	32	64	128
	OFF	204	205	1	2	4	8	16	32	64	128
Button 12	ON	207	208	1	2	4	8	16	32	64	128
	OFF	210	211	1	2	4	8	16	32	64	128
Button 13	ON	213	214	1	2	4	8	16	32	64	128
	OFF	216	217	1	2	4	8	16	32	64	128
Button 14	ON	219	220	1	2	4	8	16	32	64	128
	OFF	222	223	1	2	4	8	16	32	64	128
Button 15	ON	225	226	1	2	4	8	16	32	64	128
	OFF	228	229	1	2	4	8	16	32	64	128
Button 16	ON	231	232	1	2	4	8	16	32	64	128
	OFF	234	235	1	2	4	8	16	32	64	128

\* RED numbers are factory settings for Group A (1 to 8)

\* The ORANGE numbers are factory settings for Group B (9 to 16).

## 7.2 Signal output (EXPERT) Function mapping

This table shows how the different signal numbers (CV 131-134) are connected to output groups. It may be necessary to change this setting if you want to control turnouts and signals with the same DR4018.

	CV	output groups			
		1–4	5–8	9–12	13–16
SIGNAL 1	<b>143</b>	<b>1</b>	2	4	8
SIGNAL 2	<b>167</b>	1	<b>2</b>	4	8
SIGNAL 3	<b>191</b>	1	2	<b>4</b>	8
SIGNAL 4	<b>215</b>	1	2	4	<b>8</b>

These CVs usually contain the value 0.

Only if a signal preset (7-12) is selected via CV47 the red default values are set and the signal function mapping is activated.

If the CVs 131-134 are set manually, the corresponding function mapping CVs 143, 167, 191 and 215 must also be filled in.

## 7.3 Pulse duration of the outputs

With the following CVs you can set the pulse duration for outputs 1 to 16 as soon as these outputs are set to pulsate (bit 7 of CVs 113-128).

**Pulsed outputs are automatically activated when Preset 0 or 13 is selected in CV47.**

CV	CV Definition	Bereich	Wert
238	Pulse duration OUTPUT 1	0-255	128
239	Pulse duration OUTPUT 2	0-255	128
240	Pulse duration OUTPUT 3	0-255	128
241	Pulse duration OUTPUT 4	0-255	128
242	Pulse duration OUTPUT 5	0-255	128
243	Pulse duration OUTPUT 6	0-255	128
244	Pulse duration OUTPUT 7	0-255	128
245	Pulse duration OUTPUT 8	0-255	128
246	Pulse duration OUTPUT 9	0-255	128
247	Pulse duration OUTPUT 10	0-255	128
248	Pulse duration OUTPUT 11	0-255	128
249	Pulse duration OUTPUT 12	0-255	128
250	Pulse duration OUTPUT 13	0-255	128
251	Pulse duration OUTPUT 14	0-255	128
252	Pulse duration OUTPUT 15	0-255	128
253	Pulse duration OUTPUT 16	0-255	128

## 7.4 Signal patterns of the integrated signal decoders (CV131-134)

The integrated signal decoder always uses a group of 4 addresses per signal.

The combination of the first three addresses results in the signal pattern. In order to be able to call up the respective signal pattern, the first three addresses must therefore always be connected together.

With the fourth address, "night dimming" can be switched on and off separately: Green key switches on, red key switches off.

Adressekombination			Signal pictures when CV 131-134 not equal to 0 (Preset 7, 8, 9, 11 and 12)					
1 <sup>e</sup>	2 <sup>e</sup>	3 <sup>e</sup>		Preset 7 1] NS 3 light signal with digit displayboard	Preset 8 [2] DB HP	Preset 9 [3] DB VR-Kombi	Preset 11 [4] DB VR	Preset 12 [5] NMBS
R	R	R	0	Red	Hp0	Erloschen	Vr0	Red
G	R	R	1	Green	Hp1	Vr0	Vr1	Red blink
R	G	R	2	Yellow	Hp2	Vr0	Vr2	Double Yellow
G	G	R	3	Green blink with number	Sh1	extinction	extinction	Double Yellow flashing
R	R	G	4	Yellow with number	Hp1	Vr1	Vr0	Green-Yellow horizontal
G	R	G	5	Green-blink	Hp2	Vr1	Vr1	Green
R	G	G	6	Yellow-blink	Hp1	Vr2	Vr2	Green blink
G	G	G	7	Yellow with dial-blink	Hp2	Vr2	Erloschen	Green-Yellow vertical

R = Red button on the control panel

G = Green button on the control panel

Address Combination			Signal Images	
1 <sup>e</sup>	2 <sup>e</sup>	3 <sup>e</sup>	[2] Hauptsignal11	[3] Vorsignal
R	R	R	Hp0	Erloschen
G	R	R	Hp1	Vr0
R	G	R	Hp2	Vr0
G	G	R	Sh1	Erloschen
R	R	G	Hp1	Vr1
G	R	G	Hp2	Vr1
R	G	G	Hp1	Vr2
G	G	G	Hp2	Vr2

### Signal Images Preset 10 - DB Hp+Vr

**Preset 10** defines a combination of a DB main signal and a distant signal on the same mast, which are controlled together via function mapping with only one group of 4 addresses. This definition can only be used if such a control concept exists in the software (e.g. Koploper).

In most software products, the main and presignals each have their own address range and Preset 8 (DB\_HP) and Preset 11 (DB\_VR) should be used.