

# SwitchPilot 3 Plus

## Instruction manual

2. Edition, May 2021

From Decoder Firmware 3.0.9

51831 SwitchPilot 3 Plus



# SWITCH PILOT



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# Declaration of Conformity

## 1. Declaration of Conformity

The manufacturer, ESU electronic solutions ulm GmbH & Co. KG, Edisonallee 29, D-89231 Neu-Ulm, hereby declares under its sole responsibility that the product

**Product name: SwitchPilot 3 Plus**

**Type: 51831**

complies with all relevant provisions of the Electromagnetic Compatibility Directive (2004/108/EC). The following harmonised standards have been applied:

EN 55014-1:2006 + A1:2009: Electromagnetic compatibility - Requirements for household appliances, power tools and similar electrical appliances - Part 1: Interference emission

EN 55014-2:1997 + A1:2001 + A2:2008: Electromagnetic compatibility - Requirements for household appliances, power tools and similar electrical appliances - Part 2: Immunity.

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## 2. WEEE Declaration

Disposal of old electrical and electronic equipment (valid in the European Union and other European countries with separate collection system).



This symbol on the product of the packaging or in the documentation means that this product must not be treated as household waste. Instead, this product is to be taken to the appropriate disposal point for recycling electrical and electronic equipment. If the product is disposed of correctly, you help to prevent negative environmental influences and damage to health that could be caused by improper disposal. Recycling material will preserve our natural resources. For more information about recycling this product, please contact your local citizens' office, household waste collection service or the store where you purchased this product.

## 3. Important Notes

Congratulations on your purchase of an ESU SwitchPilot 3 Plus decoder. This manual wants to introduce you step by step to the possibilities of the decoder. Therefore, a request:

Please carefully work through this manual prior to commissioning. Although all SwitchPilot decoders are very robust, a wrong connection could destroy the device. If in doubt, avoid „expensive“ experiments.



- The SwitchPilot is intended exclusively for use with electric model railway layouts. It may only be operated with the components described in this manual. Any use other than that described in this manual is not permitted.
- All connection work may only be carried out when the operating voltage is switched off.
- The power supply units must be protected in such a way that in the event of a short circuit, there is no risk of a cable fire. Use only commercially available model train transformers manufactured according to the VDE/EN standards, bearing the CE mark.
- Never operate the SwitchPilot unattended. The SwitchPilot is not a (children's) toy.
- Follow the principles of this manual when connecting the external components. The use of other circuits may cause damage to the decoder.
- The SwitchPilot is not waterproof: outdoor use is not intended and is done at your own risk.
- Do not attempt to open your SwitchPilot module. Improper treatment can destroy it.

## 4. Features

ESU SwitchPilot 3 decoders are optimized for stationary use on your model train layout and can switch conventional solenoid turnout drives, daylight signals, magnetic uncouplers, incandescent lamps (bulbs) or other stationary electric loads.

### 4.1. General Features

The SwitchPilot 3 Plus has 16 transistor outputs for switching up to 8 solenoid accessories (e.g.: turnouts) or 16 other electric loads such as uncoupling tracks or incandescent lamps. Each output can be individually programmed for the purpose of use and is electronically protected against overload and short circuit.

The SwitchPilot 3 Plus can receive its power directly from the digital system or an external DC or AC power supply.

SwitchPilot 3 Plus supports multi-protocol operation and can be used with central units supporting the Märklin® Motorola® system (e.g.: 6021, Central Station® or Mobile Station®) as well as DCC enabled command stations. Configuration can be carried out on the main (POM – Programming on the Main) and the programming track. Thanks to RailCom®, CVs can also be read out.



Operation with the Roco® Lokmaus 2 is not possible: The Lokmaus 2 sends only DCC locomotive commands instead of the required accessory commands.

For simplifying the rather cumbersome configuration of accessory decoders, the SwitchPilot 3 Plus has an innovative operating concept consisting of a 4-line, illuminated OLED display and three input buttons. All settings can be checked directly on the decoder at any time with the help of the display and changed, if so desired. „Programming“ with the help of your command station is not required. It cannot get any easier.

## 4.2. Technical Data

|                 | SwitchPilot 3 Plus  |
|-----------------|---|
| Input voltage   | 12V - 20V DC power supply<br>12V - 16V AC power supply<br>Digital track voltage   |
| Outputs         | 16 Transistor outputs<br>Maximum load 1.5A each (2.5A for 100msec) arranged in 8 groups as a pair<br>Short-circuit and overload-protected   |
| Output power    | Complete module 2A (2,5A for 100mS)   |
| Feedback inputs | Unavailable   |
| Operating modes | DCC „Accessory Decoder“ with RailCom® (addressing according to RCN-213 oder ROCO®). Turnout numbers 1 - 2048. Märklin® Motorola®. Turnout numbers 1 – 256. K83 and K84 operating modes. |
| Configuration   | 0.91 " OLED display with 3 buttons  |
| Dimensions      | 86mm x 86mm x 25mm  |

### 4.3. Scope of delivery

The SwitchPilot 3 Plus is supplied with 5 detachable terminal blocks (1x 4-pole for the track connection, 4x 5-pole for the outputs) as well as this operating manual. Under part number 51800. SP.01 a pack of replacement terminal blocks is available from ESU.

# Operating modes

## 4.4. Operating modes

The SwitchPilot 3 Plus has a total of 16 transistor outputs, which are grouped in 8 output pairs 1 to 8. Each output pair contains two outputs (Out A and Out B) and can be configured individually to suit the desired application. The following operating modes are possible:

### 4.4.1. Pulse operation

If the output is configured for pulse operation, the output is switched on as soon as an appropriate command is received. At the same time, a timer automatically turns off the output as soon as a predetermined time (pulse time) saved in the decoder has elapsed, even if the button (on the command station or control panel) has been released beforehand.

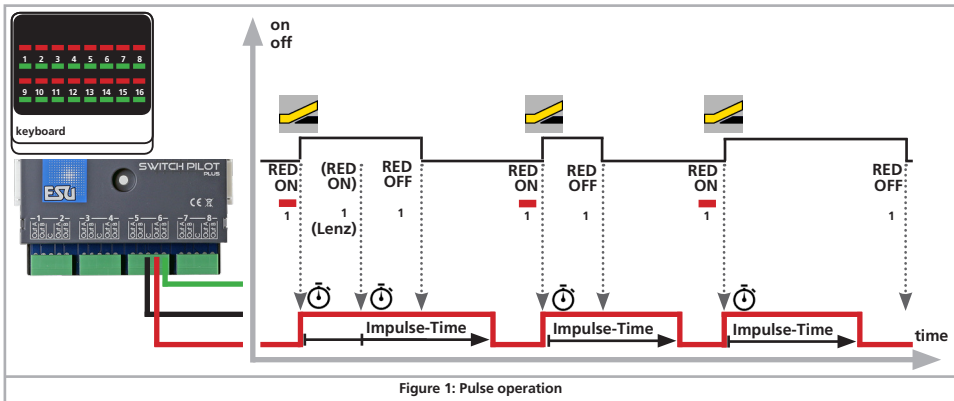
If the button is pressed longer than the pre-determined pulse time, the output will still be switched off.

Limiting the switch-on time prevents accessories to blow. Optionally, the output can also be slowly dimmed up and dimmed down (so-called „zoom“ for incandescent lamp simulation).

The pulse operation is the default setting of the SwitchPilot 3 Plus and is ideal for controlling solenoid turnout drives.



Some DCC command stations (e.g.: by Lenz) repeat the power command in a fixed rhythm until the button is released. With each power-on command received, the SwitchPilot 3 Plus resets the stopwatch. This is shown in Fig. 1.



# Operating modes

## 4.4.2. Operating PECO turnout drives

The PECO mode corresponds to the afore mentioned pulse operation with the exception that to increase the peak current the overcurrent protection of the output pair is switched off and the pulse time is fixed to a relatively short time span. This short current surge is used to optimally control the PECO drives.



Incorrect wiring or a short circuit at an output in PECO mode can destroy the SwitchPilot 3 Plus decoder!

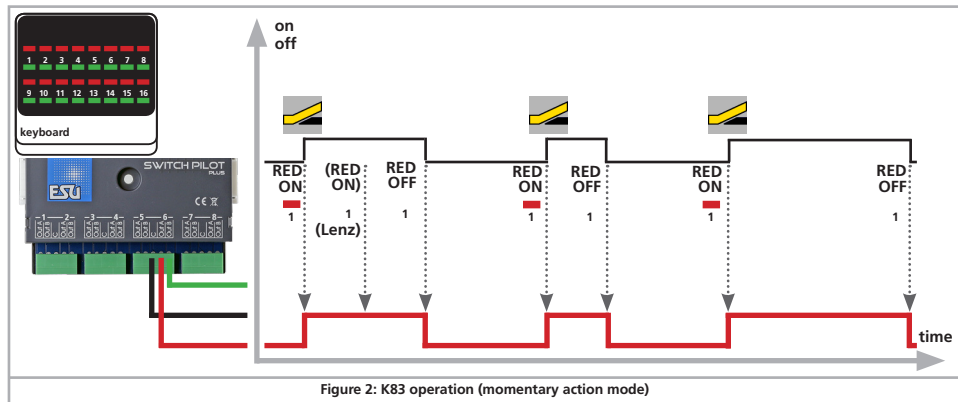
## 4.4.3. K83 operation (momentary action mode)

In K83 mode, the output remains active until the button on the command station or control panel is released. This operating mode is suitable for turnout drives with end position shutdown or for uncoupling tracks.

Optionally, the output can also be slowly dimmed up and dimmed down (so-called „zoom“ for incandescent lamp simulation).



K83 operation may cause problems with older DCC command stations, because they do not transmit the required „Off“ command (e.g.: older Lenz command stations).




# Operating modes

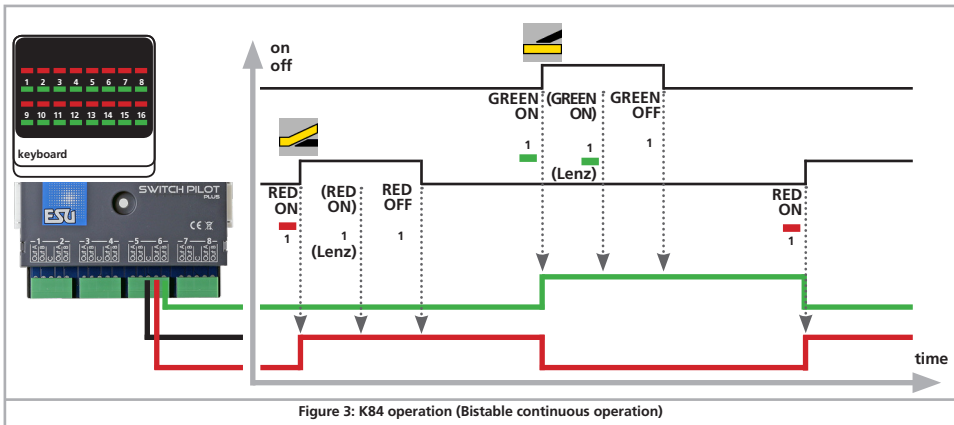
## 4.4.4. K84 Operation (Bistable continuous operation)

In K84 mode, the two outputs are alternately switched on and off: When pressing the first button (red) on the command station, the Output Out A is turned on. It remains active until pressing the assigned button (green) activates the output Out B of the same output group. Out A and Out B behave like a change-over switch.

Optionally, the output can also be slowly dimmed up and dimmed down (so-called „zoom“ for incandescent lamp simulation).

The K84 operation is well suited for lighting applications or two-aspect daylight signals.

 The logic of this mode of operation corresponds to the Märklin® k84 decoder.





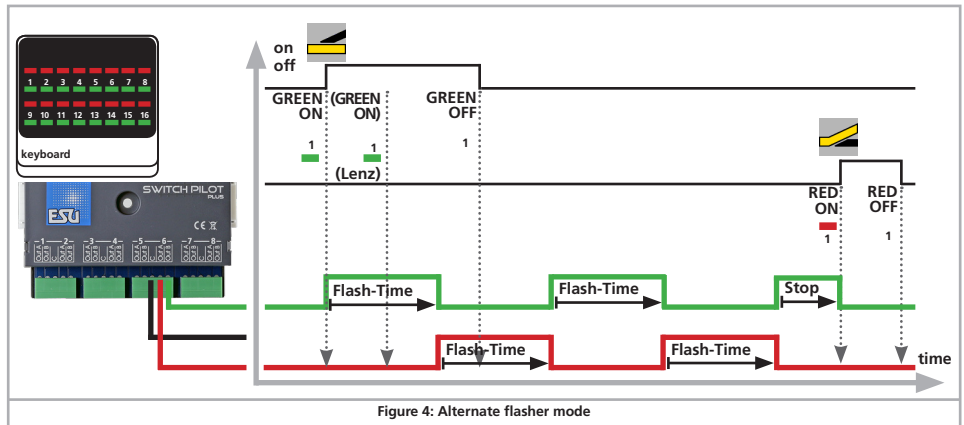
# Operating modes

## 4.4.5. Alternate flasher mode

In this mode, the outputs Out A and Out B of an output pair are switched on alternately with an adjustable flashing frequency. The alternate flasher is started with the command „Straight/Green“ of the assigned button and stopped again with the command „Diverging/Red“.

Optionally, the output can also be slowly dimmed up and dimmed down (so-called „zoom“ for incandescent lamp simulation).

The alternating flasher operation is ideal for illuminating St. Andrew's crosses at level crossings.



# Connection to the digital system

## 5. Connection to the digital system

We recommend that you first configure the SwitchPilot 3 Plus decoder completely and then install it on the layout.

### 5.1. Terminals

Fig. 5 shows the SwitchPilot 3 Plus with all terminals.

- a) Turnouts, daylight signals, uncouplers and similar electric loads shall be connected to the terminals labelled 1 to 8 for the output pairs 1 to 8.
- b) The power supply of the SwitchPilot 3 Plus including all connected loads is realized via the Terminals Pw A and Pw B. You can either use the track voltage or use an external power supply. We recommend an external power supply, particularly for larger layouts, because then the energy for powering the drives does not add to the load for the command station or booster.
- c) Connect the Terminals Trk A and Trk B to the track output of the command station (or booster) that controls the SwitchPilot Plus 3.
- e) Input unit. The three buttons PROG/OK as well as (+) and (-) serve to configure the decoder, as explained in chapter 6.
- f) The display shows all settings of the decoder including turnout address and status of the outputs. After a few seconds, the screen saver displays the supply voltage.
- g) Extension socket for the SwitchPilot Extension relay module.

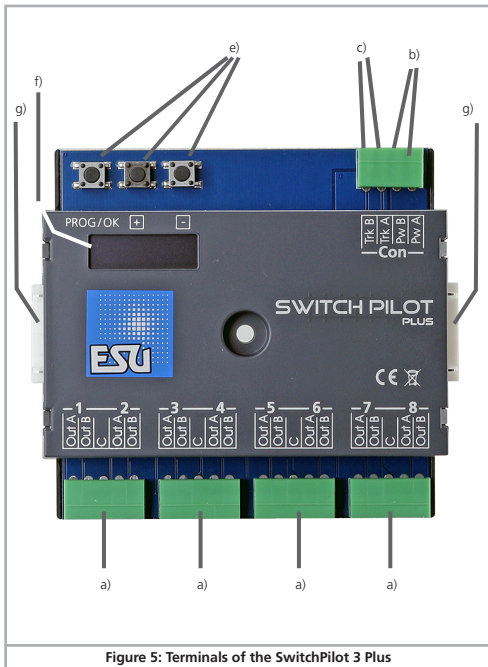


Figure 5: Terminals of the SwitchPilot 3 Plus

# Connection to the digital system

## 5.2. Power supply by the digital system

For smaller layouts with only a few electric loads turned on at the same time, the SwitchPilot 3 Plus can be supplied directly from the command station or booster. The terminals Pw A and Pw B are connected parallel to the terminals Trk A and Trk B.



If accessories (e.g.: Märklin® K track) do not switch at all or only respond with little power, check the track voltage and increase it, if necessary. The SwitchPilot 3 Plus can display the supply voltage as described in chapter 6.8.1. If the voltage cannot be increased, please use an external power supply.



This wiring scheme must be used if you want to configure the SwitchPilot 3 Plus on the programming track of your command station. For more information, see Chapter 9.

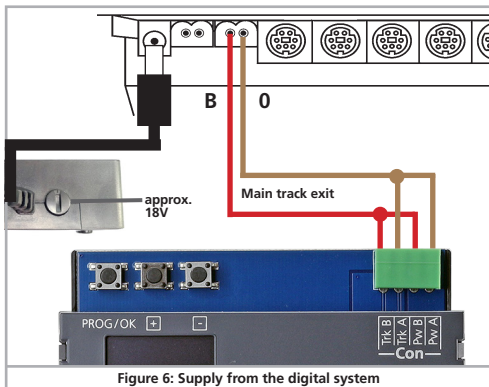


Figure 6: Supply from the digital system

## 5.3. External power supply

For larger layouts with many electric loads, we recommend the use of an external power supply. DC and AC power supplies are suitable with the specifications described in chapter 4.2. We recommend the use of a stabilized **DC power supply** with at least **18V DC** at least **3A** output power (e.g.: ESU part number 50119).



For switching Märklin® K track drives a minimum of 18V is required. Keep this in mind when choosing the transformer! The SwitchPilot 3 Plus can display the supply voltage as described in chapter 6.8.1.



This type of wiring cannot be used for programming on the programming track. In this case, a temporary connection must be established as shown in chapter 5.2.

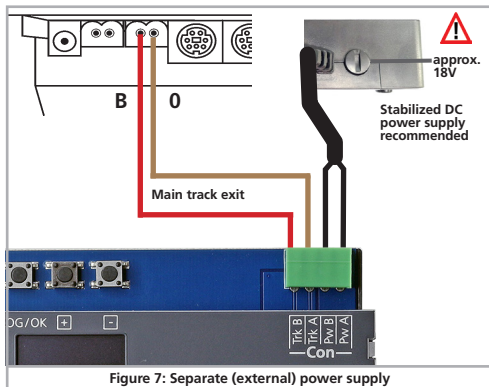


Figure 7: Separate (external) power supply

# Wiring the outputs

## 5.4. Wiring the outputs

### 5.4.1. Solenoid turnout drives

You may use any of the commercially available solenoid turnout drives from the well-known manufacturers with the SwitchPilot 3 Plus. Figure 8 shows the wiring of a turnout at output 1.

- The common wire from the two coils is connected to terminal C.
- Terminal Out A is connected to the wire for the diverging route.
- Terminal Out B is connected to the wire for the straight route.

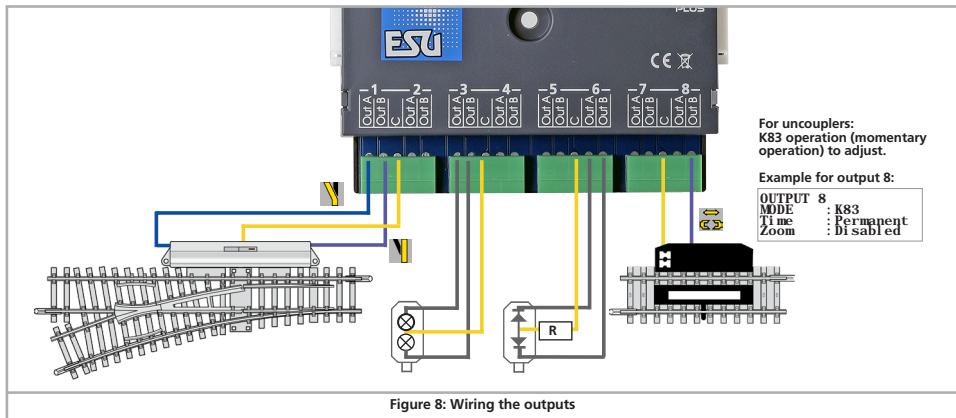
**i** Should the turnout not be aligned as you intended after pressing the respective button on your command station respectively control panel (diverging and straight route are reversed), please swap the wires at terminals Out A and Out B.

**i** The power consumption of PECO switch drives is so high that the PECO operating mode must be set.

### 5.4.2. Daylight signals with incandescent lamps or LEDs

If you are using daylight signals with incandescent lamps (bulbs) or LEDs (light-emitting diodes), the corresponding output must be configured in the K84 mode (Bistable continuous operation).

Incandescent lamps, as shown in Figure 8, Output 2, may be directly connected to the SwitchPilot 3 Plus.



# Wiring the outputs

If, on the other hand, signals or lighting with LEDs are used (as shown in Figure 8, Output 6), a series resistor must be used to limit the current. The resistance value depends to a large extent on the type of LED used, so no precise statement is possible here. Values between 1 kOhm and 10 kOhm are common. If in doubt, start with a higher value.

**i** The terminal C of the output is the „+“ pole. Therefore, the cathode of the LED must be connected to the terminals Out A or Out B.

## 5.4.3. Uncoupling tracks

The momentary action mode is suitable for uncoupling tracks, as the coil will be active only until the button is released. The wiring is as shown in Fig. 8, Terminal 8. You can use either Terminal Out A or Out B, depending on whether you want to activate the uncoupler with the „diverging“ or „straight“ turnout button.

## 5.5. Connecting the SwitchPilot Extension

Up to two SwitchPilot Extension Modules can be docked to the side of the SwitchPilot 3 Plus. To do this, press the modules with the 8-pin plugs against each other until the latches on the plugs engage. The internal logic and the relay coils of the SwitchPilot Extension Module are also supplied by the SwitchPilot 3 Plus.

The SwitchPilot Extension module on the left is responsible for outputs 1 to 4, the SwitchPilot Extension module on the right is responsible for outputs 5 to 8.

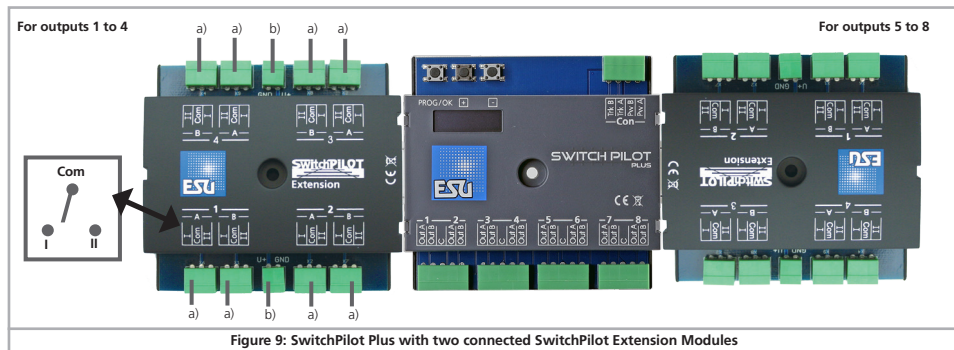


Figure 9: SwitchPilot Plus with two connected SwitchPilot Extension Modules

## 5.5.1. Relay outputs

Fig. 9 shows the connections

- The outputs 1 to 4 are connected to relay outputs A and B, which are activated jointly (2x change-over contacts, bistable). Each relay output corresponds to the corresponding transistor output of the SwitchPilot 3. If the output Out A of the SwitchPilot 3 is active, the terminals I and COM of the relay output are also active. If the output Out B on the SwitchPilot 3 is active, terminals II and COM are also active..
- Terminals for ground and „U+“ (rectified track voltage, supplied by SwitchPilot 3) for powering DC turnout motors.

## 5.5.2. Motorized turnout drives

Motorized turnout drives can be controlled with the help of the SwitchPilot Extension module. Reversing the operating voltage of the electric motor changes the direction of rotation of the motor, thereby moving the turnout from one position (status) to the other.



Use only turnout drives with limit stop contacts to prevent the motor from burning through, because the relay outputs of the SwitchPilot Extension module are continuously active.

The wiring of the motorized turnout drive is shown in Fig. 10. Please note the maximum supply voltage values specified in the instructions for your drive. The Extension module always delivers the full voltage that is provided to the SwitchPilot 3.

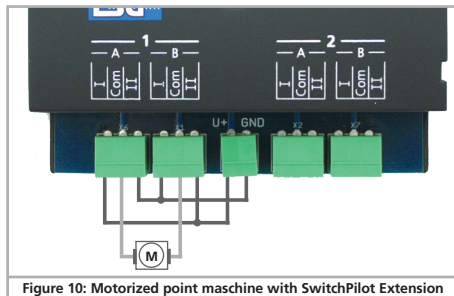
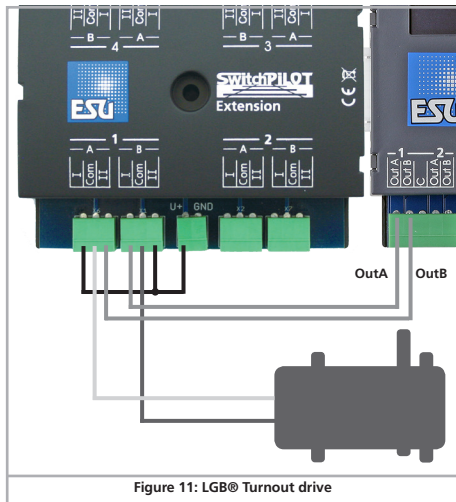


Figure 10: Motorized point machine with SwitchPilot Extension

# Wiring the outputs

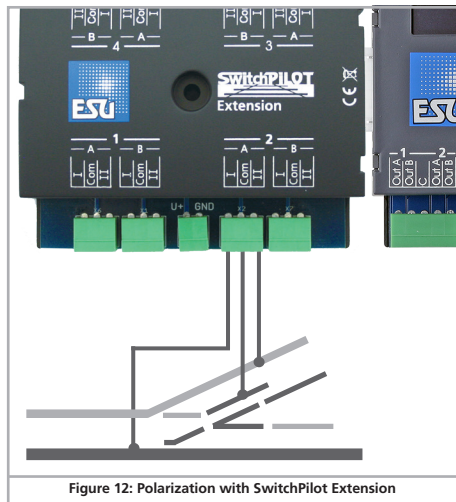
## 5.5.3. LGB® Turnout drive

The wiring is as shown in Fig. 11. Unless reprogrammed, the motors are supplied with electricity for approx. 520 msec and are then switched off to prevent overheating of the drive.



## 5.5.4. Turnout frog polarization

With the SwitchPILOT Extension Module turnout frog polarization can be set very easy.



## 6. Configuration with OLED

The programming of accessory decoders was usually very cumbersome in the past. CV programming with the help of the hand-held throttle often failed due to the missing programming modes (e.g.: only very few command stations and/or throttles respectively central units support „POM for accessory decoders“) or forgotten addresses of decoders installed on the layout. Even assigning the decoder address presented many model railway enthusiasts with major obstacles. Reading the currently assigned decoder address is also quite cumbersome and causes a lot of displeasure.

To avoid such problems, the SwitchPilot 3 Plus is the first accessory decoder on the market working with an innovative operating concept. It consists of an illuminated multi-line OLED display and a 3-button input unit. This allows programming all (!) settings of the SwitchPilot 3 Plus in plain text directly on the decoder, without the need of external programming devices or cumbersome CV programming. In addition, the display shows the currently assigned turnout numbers at any time and can even accurately display the supply voltage (respectively track voltage). A screen saver prevents the OLED display from burning in.

### 6.1. Relationship between accessory addresses and turnout numbers

For addressing the outputs of the SwitchPilot 3 Plus decoder with the command station, so-called turnout numbers must be assigned to them. The number of turnout numbers is limited and depends on the digital system:

Motorola@: Turnout numbers 0001 to 0256

DCC: Turnout numbers 0001 to 2048  
(ROCO command stations 0001 to 2040).

The turnout numbers are arranged into four groups. The first group comprises turnout numbers 1,2,3,4, the second group the turnout numbers 5,6,7,8, the third group the turnout numbers 9,10,11,12, and so forth.

Each SwitchPilot 3 Plus can be assigned **two** 4-series groups: this is the so-called accessory address.

The accessory address 1 is stored internally in CV 1 and CV 9. The accessory address 2 is stored internally in CV 35 and CV 36. The calculation of the turnout numbers from the values saved in the two CVs is regulated in the RCN-213 standard.

The table in chapter 16 lists turnout numbers and corresponding accessory addresses. Only the first 256 turnouts are available when operating with Motorola® central units.



It is not possible to assign turnout numbers outside the group-of-4 limits to a SwitchPilot 3 Plus. For example, it would not be possible to assign turnout numbers 4, 5, 6 and 7, as these go beyond the limit of the accessory address groups. Please keep this in mind when assigning turnout numbers.

The two output groups 1 to 4 and 5 to 8 can be selected independently .



Due to a weakness in the DCC standard prior to the creation of the RCN-213, some command stations (especially ROCO® Multi-maus or Z21) calculate the turnout numbers differently. In this case please take note of chapter 6.3.



# Assigning turnout numbers

## 6.1.1. Assigning turnout numbers

Ex works, the 8 double outputs of the SwitchPilot 3 Plus respond to turnout numbers 0001 to 0004 and 0005 to 0008. The turnout numbers can be easily changed directly on the SwitchPilot 3 Plus.

- a) Check whether the display shows the screen saver (lettering „SPP“ and the supply voltage):

```
SPP»17.3V
```

- b) In this case, press the „PROG/OK“ button only (!) briefly. Now the SwitchPilot 3 Plus should display its current turnout numbers directly in plain text:

```
ADDRESS  
Swi tch 1-4: 0001-0004  
Swi tch 5-8: 0005-0008
```

- c) Press the „PROG/OK“ button. The turnout numbers 1 to 4 should now flash (inverse).

```
ADDRESS  
Swi tch 1-4: 0001-0004  
Swi tch 5-8: 0005-0008
```

- d) Press the button (+) or (-) to select the desired turnout numbers for outputs 1 to 4. The currently selected turnout numbers are displayed flashing.

- e) Press the „PROG/OK“ button again to confirm the turnout numbers for outputs 1 to 4. The display no longer flashes, but the one for outputs 5 to 8.

```
ADDRESS  
Swi tch 1-4: 0009-0012  
Swi tch 5-8: 0005-0008
```

- f) Press the button (+) or (-) to select the desired turnout numbers for outputs 5 to 8. The currently selected turnout numbers are displayed flashing.
- g) Press the „PROG/OK“ button again to confirm the turnout numbers for outputs 5 to 8. The display no longer flashes.

```
ADDRESS  
Swi tch 1-4: 0009-0012  
Swi tch 5-8: 0013-0016
```

Finished! Without programming or cumbersome handling on the handheld throttle or command station.

# Introduction to the operating structure

## 6.2. Introduction to the operating structure

The configuration with the aid of the OLED display and the 3-button input unit enables you to set all parameters of the SwitchPilot 3 Plus decoder.

All properties are arranged in so-called „panels“. A panel fills in all four lines of the display. The first line displays the name of the panel, and rows two to four display a maximum of three different setting options. With the help of the „+“ and „-“ buttons you can scroll between the individual panels.

- a) Name of the panel
- b) Name of setting option 1
- c) Value of the setting option 1
- d) Name of setting option 2
- e) Value of the setting option 2
- f) Name of the setting option 3
- g) Value of the setting option 3

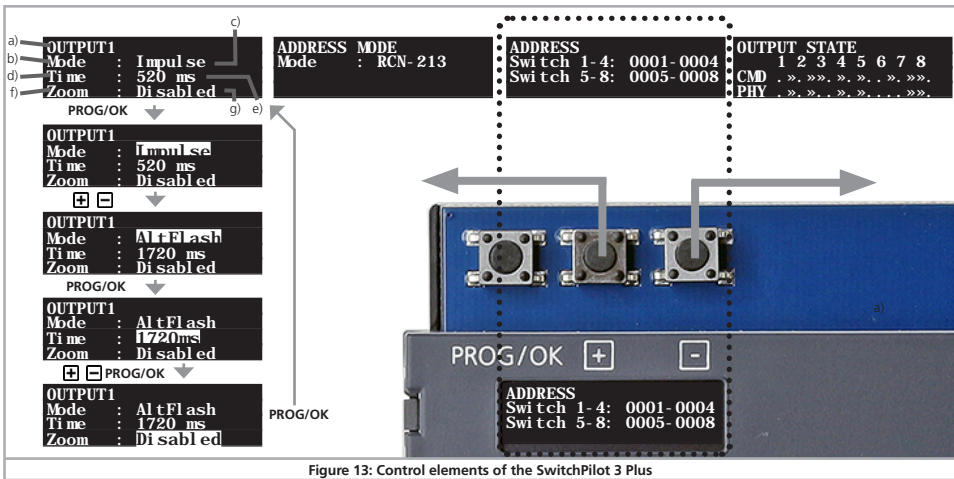


Figure 13: Control elements of the SwitchPilot 3 Plus

# Introduction to the operating structure

- If you want to change a setting option of the currently selected panel, press the **PROG/OK** button once. The setting option 1 of the screen will now flash as a sign that it can be changed.
- For changing the respective setting use the (+) and (-) buttons. Press the button until the display shows the desired value. The decoder immediately applies the changes so you can see immediately what is happening.
- Confirm your entry with **PROG/OK**. After that, the next setting option will flash as a sign that it can now be changed.



If you do not want to change a setting option, but only want to proceed to the next one, just press the **PROG/OK** button. Then the current value is not changed.

After you have changed the last of the three setting options respectively confirmed them by pressing **PROG/OK**, nothing will flash. You are now back in the display mode of the panel and can now either make changes to other setting options of the panel by pressing **PROG/OK** again or select another panel with the (+) and (-) buttons.

For a list of all possible panels and their setting options, see Chapter 15.

## 6.3. Address mode for ROCO® command stations

As already mentioned in Chapter 6.1, ROCO® command stations (specially the multiMaus, but also the Z21 in the standard setting) use a different computation method to calculate the turnout numbers from the accessory addresses. Set the decoder to "ROCO" to ensure that the SwitchPilot 3 Plus handles instructions from ROCO® command stations correctly.

To do this, select „Mode“ in the „ADDRESS MODE“ panel, and then select the calculation method „ROCO“.

## 6.4. Configuring outputs

Each output can be configured individually. For this purpose, the panels „OUTPUT 1“ to „OUTPUT 8“ are provided.

You can use the "Mode" option to set the desired output mode:

|                |             |
|----------------|-------------|
| <b>OUTPUT1</b> |             |
| Mode           | : Impul se  |
| Time           | : 520 ms    |
| Zoom           | : Di sabled |

|                |             |
|----------------|-------------|
| <b>OUTPUT2</b> |             |
| Mode           | : PECO      |
| Time           | : Permanent |
| Zoom           | : Di sabled |

|                |             |
|----------------|-------------|
| <b>OUTPUT7</b> |             |
| Mode           | : K83       |
| Time           | : Permanent |
| Zoom           | : Di sabled |

|                |              |
|----------------|--------------|
| <b>OUTPUT8</b> |              |
| Mode           | : Alt-Fl ash |
| Time           | : 1170ms     |
| Zoom           | : Enabled    |

- "Pulse" configures pulse operation according to chapter 4.4.1.
- "PECO" configures PECO operating mode according to chapter 4.4.2.
- "K83" configures momentary action mode according to chapter 4.4.3.
- "K84" configures bistable continuous operation according to chapter 4.4.4.
- "Alt Flash" configures the alternating flasher operation according to chapter 4.4.5.

The meaning of the „Time“ option depends on the selected output mode:

- In pulse mode, it is determined here how long the output remains switched on.
- In alternating flasher mode, you specify how fast the two outputs should flash.
- In all other modes, „Time“ has no meaning and cannot be changed respectively is set to „Permanent“.

# Introduction to the operating structure

For particularly realistic fade-in and fade-out effects, you can add a „zoom“ function to each output, if so desired:

- “Enabled” enables the pair to fade-in and fade-out
- “Disabled” turns off the fade-in and fade-out feature of the output pair.

## 6.5. Setting fade-in and fade-out times

Here you can choose the time during which the outputs should be dimmed up or down if the „Zoom“ option is active at the corresponding output.

The time can be set from 0 msec to 4160 msec. The value „0 msec“ turns off this feature for all outputs.

```
FADEIN & FADEOUT
Time : 260ms
```



Do not choose exceedingly long durations. Especially in alternating flasher mode, you should make sure that the flashing frequency is selected significantly longer than the fade-in and fade-out times.

## 6.6. Status information

The SwitchPilot 3 Plus can display extensive status and diagnostic information, which can be particularly helpful, especially for wiring and troubleshooting.

### 6.6.1. Display software version & track voltage

The „Information“ panel displays both the hardware („HW“) as well as the software („SW“) version of the decoder. The supply voltage („Voltage“) of the outputs is also displayed.

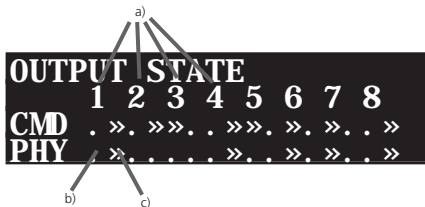
```
INFORMATION
HW : 3.0
FW : 3.0.9
Voltage : 17.3V
```



If the SwitchPilot 3 Plus is powered directly by the command station, „Voltage“ displays the digital track voltage, otherwise the voltage of the connected power supply.

## 6.6.2. Displaying output states

Important information about the output state is provided by the „Output State“ panel



- a) Number of the output
- b) Output terminal „Out A“ active
- c) Output terminal „Out B“ active

The PHY line indicates for each output 1 to 8 whether it is currently active. As soon as the state changes (e.g.: when an alternate flasher is active or because an output is switched off by the timer), this is displayed in real time.



If the fade-in and fade-out feature is active for an output, the output is immediately displayed as active, even if it is still fading in or - out.

The line CMD shows the latest command received for each output 1 to 8: A bar to the left directly below the number indicates that the command „Red“ was received from the command station, a bar to the right of it indicates that the last command was „Green“. If no valid command has been detected, only dots are displayed. The SwitchPilot 3 Plus saves the most recently detected commands so that the last operating state is restored after a power interruption.

## 7. Configuration with LokProgrammer

Please always use the latest PC software for your LokProgrammer, but at least version 5.1.0. To ensure a correct reading, connect the SwitchPilot 3 as shown in Fig. 14 (**Pw A** and **Pw B**).

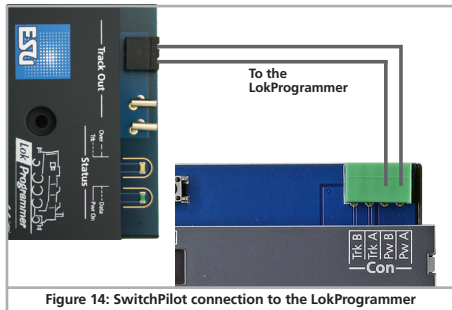


Figure 14: SwitchPilot connection to the LokProgrammer

## 8. Configuration POM (Programming on the Main)

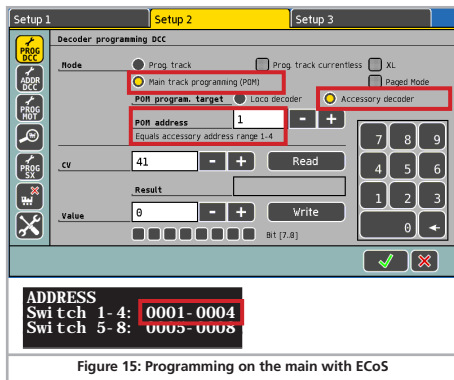
The SwitchPilot 3 Plus may remain installed on your layout during programming. For POM to work, your command station must also support „Programming on the Main (POM)“ for accessory decoders (!). Thanks to RailCom®, ECoS owners can even read out the values (see chapter 11).

### 8.1. Connection to the digital system

The SwitchPilot 3 Plus does not require any special connections. It may remain wired as shown in chapter 5.2. respectively 5.3.

### 8.2. Reading and writing CVs with POM

Select “POM” as well as „Accessory decoder” on your command station. Make sure that the correct accessory address is selected (it must be the first one!).



| ADDRESS               |
|-----------------------|
| Switch 1-4: 0001-0004 |
| Switch 5-8: 0005-0008 |

Figure 15: Programming on the main with ECoS

# Configuration with the programming tack

You can write all the CVs of the SwitchPilot 3 Plus decoder and read them subject to the capabilities of the command station. With the ECoS, this is done as follows:

- Go to the main programming menu of the ECoS.
- Select "POM", "DCC" and "Accessory decoder".
- Select the „POM address“ of the SwitchPilot 3. Alternately the corresponding turnout numbers are displayed as well.
- Select the CV you want to read or write.
- Press the „Read“ or „Write“ button.

With the aid of Z21 maintenance tool, the ROCO® Z21 can also read or write the CV values of the SwitchPilot 3.

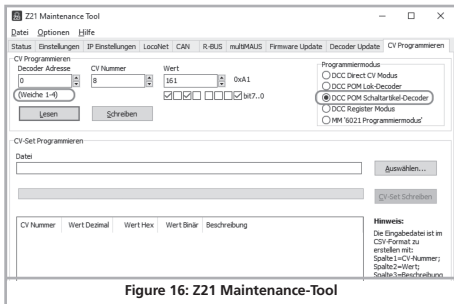


Figure 16: Z21 Maintenance-Tool

For this to work, RailCom® must be active on the SwitchPilot 3 Plus. Please also refer to chapter 11.



Unfortunately, many command stations do not support the POM mode for accessory decoders, but only for mobile (locomotive) decoders. In this case, configure the SwitchPilot directly using its display.

## 9. Configuration with the programming track

In some cases, it may be desirable to change the properties of the SwitchPilot via the programming track of the digital system. There, the CVs can not only be written, but also read. This is conveniently done before the final installation on the layout.

### 9.1. Connection to the digital system

Wire the SwitchPilot 3 Plus as described in chapter 5.2. Power must be provided by the digital system.

### 9.2. Read & Write CVs

Reading should work with all DCC compliant command stations. However, some command stations do not provide enough voltage for the programming track or sometimes report an overcurrent. In these cases, POM should be used, or - even better - configure the SwitchPilot directly using its the display.

## 10. Learning turnout numbers from command station

The accessory address (and thus the assigned turnout numbers) can also be learned directly from the command station. To do this, the SwitchPilot Plus must first be put into ADDRESS mode:

- Press the **PROG/OK** button when the screen saver is displayed.
- Press the PROG/OK button, then the previous turnout numbers (factory default: 0001-0004) will flash inversely.

```
ADDRESS  
Switch 1-4: 0001-0004  
Switch 5-8: 0005-0008
```

The decoder is now ready to „learn“ an address as soon as an accessory of the desired group of 4 is switched on at the command station.

- Now turn on an accessory of your choice at the command station. How accessories are switched, you can find out in the manual of your command station or the handheld throttle.
- Once the switch command has been understood by the SwitchPilot, the new address is saved and the numbers no longer flash.
- If you want to change the address of the second group, proceed as follows:
  - Press the **PROG/OK** button, the previous turnout numbers (ex works 0001-0004) will flash inversely .
  - Press the **PROG/OK** button again so that the turnout numbers for the second group (ex works 0005-0008) flash inversely.
- Now switch a solenoid of your choice to the digital center. You can find out how solenoid accessories are switched in the manual for your control center or the speed controller.

```
ADDRESS  
Switch 1-4: 0001-0004  
Switch 5-8: 0005-0008
```

- As soon as the switch command has been understood by the SwitchPilot, the address is changed and the numbers no longer flash.



The assignment of the turnout numbers is always carried out in ascending groups of 4. No matter what accessory you switch, the first output will always be aligned at the beginning of the group of 4.

### Example 1:

You switch the turnout number 1. All four outputs are then configured in ascending order to turnout numbers 1 to 4.

### Example 2:

You switch the turnout number 3. All four outputs are also configured in ascending order to turnout numbers 1 to 4, because turnout number 3 is in the same group of 4 as turnout number 1 from the first example.

### Example 3:

You switch the turnout number 11. All four outputs will now receive the turnout numbers 9 to 12 in ascending order.

## 11. RailCom®

RailCom® is a technique for transferring information from the decoder back to the command station. When RailCom® is switched on, the CV values of the SwitchPilot can be read out directly on the main. From the factory, RailCom® is active on SwitchPilot 3.

### 11.1. RailCom® Configuration

If necessary, RailCom® can be disabled on the SwitchPilot.

```
RAILCOM
Mode   : Enabled
CH2    : Enabled
```

In this case „Mode“ must be set to „Disabled“. The value of CH2 is intended for future expansions and should not be changed.

## 12. Reset to factory default (decoder reset)

You can restore the decoder's factory default settings at any time.

### 12.1. With the programming button

- Disconnect the power supply to the SwitchPilot 3 Plus decoder. The display must go out.
- Press and hold the **PROG/OK** button.
- Reconnect the power supply for the decoder. The decoder will be reset to factory default values.
- Release the **PROG/OK** button. The turnout numbers are now flashing because the SwitchPilot 3 expects to assign new turnout numbers (as described in chapter 6.1.).
- Confirm the turnout numbers with **PROG/OK** or first assign the new turnout numbers with (+) or (-).

### 12.2. With DCC systems

To do this, write the **value 8 in CV 8** either via POM (wiring as per chapter 8) or on the programming track (wiring as per chapter 9). The display of the SwitchPilot 3 Plus briefly goes dark, after which the factory values are restored.



Writing in CV 8 is a special case, so some command stations may display an error „err02“ or similar. However, the SwitchPilot will accept the command.

### 12.3. With the display

The „RESET DECODER“ panel on the display enables you to restore the factory default values directly.

```
RESET DECODER
Do Reset: Yes
```

- In the “Do Reset” option, select „Yes“ and confirm with **PROG/OK**. The display will flicker briefly, after which the SwitchPilot will be restored to have factory default values again.



## 13. Support

Should you have questions regarding your SwitchPilot to which you have not found the right answer in this manual please first contact your hobby shop. The people there are your competent contact for all questions relating to model trains. In difficult cases, you can contact us directly. Look first on our website under «Support / FAQ» to see whether the question has already been answered. If this is not the case, we ask you to make these available to us either in our support forum or to contact us by e-mail. We also provide a telephone hotline, which should only be used in the case of really special requests:

### **For Germany**

by phone: +49 (0) 731 - 1 84 78 - 106  
Tuesday & Wednesday  
from 10.00 to 12.00 o' clock

by Fax : +49 (0) 731 - 1 84 78 - 299

by E-Mail: [www.esu.eu/kontakt](http://www.esu.eu/kontakt)

by mail: ESU GmbH & Co. KG  
Edisonallee 29  
D-89231 Neu-Ulm

**[www.esu.eu](http://www.esu.eu)**

### **For USA, Canada, Australia**

by phone: +1 570-980-1982  
Tuesday & Thursday  
from 8am to 4pm (EST)

by Fax : +1 866-591-6440

by E-Mail: [support@loksound.com](mailto:support@loksound.com)

by mail: ESU LLC  
1304 Jordan Ave  
Montoursville PA 17754

**[www.loksound.com](http://www.loksound.com)**

# Menu reference SwitchPilot 3 Plus

## 14. Menu reference

| No | Screen   | Options  |
|----|--|--|
| 01 | ADDRESS<br>Switch 1-4: 0001-0004                                     | Switch 1-4: Turnout numbers outputs 1 bis 4  |
| 02 | ADDRESS MODE<br>Mode : RCN-213                                       | Mode: RCN-213: Addressing as RCN-213.<br>Mode: ROC0 : Addressing as ROC0.                                      |
| 03 | OUTPUT MODE 1<br>Mode : Impul se<br>Time : 520ms<br>Zoom : Di sabled | Mode: IMPULSE   PECO   K83   K84   AltFlash<br>Time: 130 ms   195 ms   .. 2015 ms<br>Zoom: Di sabled   Enabled |
| 04 | OUTPUT MODE 2<br>Mode : Impul se<br>Time : 520ms<br>Zoom : Di sabled | Mode: IMPULSE   PECO   K83   K84   AltFlash<br>Time: 130 ms   195 ms   .. 2015 ms<br>Zoom: Di sabled   Enabled |
| 05 | OUTPUT MODE 3<br>Mode : Impul se<br>Time : 520ms<br>Zoom : Di sabled | Mode: IMPULSE   PECO   K83   K84   AltFlash<br>Time: 130 ms   195 ms   .. 2015 ms<br>Zoom: Di sabled   Enabled |
| 06 | OUTPUT MODE 4<br>Mode : Impul se<br>Time : 520ms<br>Zoom : Di sabled | Mode: IMPULSE   PECO   K83   K84   AltFlash<br>Time: 130 ms   195 ms   .. 2015 ms<br>Zoom: Di sabled   Enabled |
| 07 | OUTPUT MODE 5<br>Mode : Impul se<br>Time : 520ms<br>Zoom : Di sabled | Mode: IMPULSE   PECO   K83   K84   AltFlash<br>Time: 130 ms   195 ms   .. 2015 ms<br>Zoom: Di sabled   Enabled |
| 08 | OUTPUT MODE 6<br>Mode : Impul se<br>Time : 520ms<br>Zoom : Di sabled | Mode: IMPULSE   PECO   K83   K84   AltFlash<br>Time: 130 ms   195 ms   .. 2015 ms<br>Zoom: Di sabled   Enabled |

|    |  |  |
|----|--|--|
| 09 | <b>OUTPUT MODE 7</b><br>Mode : Impulse<br>Time : 520ms<br>Zoom : Disabled  | Mode: IMPULSE   PECO   K83   K84   AltFlash<br>Time: 130 ms   195 ms   .. 2015 ms<br>Zoom: Disabled   Enabled  |
| 10 | <b>OUTPUT MODE 8</b><br>Mode : Impulse<br>Time : 520ms<br>Zoom : Disabled  | Mode: IMPULSE   PECO   K83   K84   AltFlash<br>Time: 130 ms   195 ms   .. 2015 ms<br>Zoom: Disabled   Enabled  |
| 11 | <b>FADEIN &amp; FADEOUT</b><br>Time : 65 ms  | Time: 0 ms   65 ms .. 4160 ms  |
| 12 | <b>RAILCOM</b><br>Mode : Enabled<br>CH2 : Enabled  | Mode: Enabled   Disabled<br>CH2 : Enabled   Disabled   |
| 13 | <b>INFORMATION</b><br>HW : 3.0<br>SW : 3.0.9<br>Voltage : 18.4V  | HW: Hardware version of the decoder.<br>SW: Software version of the decoder. Update with LokProgrammer<br>Voltage: Supply voltage of the decoder (if necessary rail tension) |
| 14 | <b>OUTPUT STATE</b><br>1 2 3 4 5 6 7 8<br>CMD . » . » . » . » . » . » . » . » . » . » . » .<br>PHY . » . » . » . » . » . » . » . » . » . » . » . » . |  |

# Solenoid address & turnout numbers

## 15. Solenoid address & turnout numbers

CV1 and CV9 follow RCN-213

| Turnout numbers |     |     |     | Address | CV1 | CV 9 |
|-----------------|-----|-----|-----|---------|-----|------|
| 1               | 2   | 3   | 4   | 1       | 1   | 0    |
| 5               | 6   | 7   | 8   | 2       | 2   | 0    |
| 9               | 10  | 11  | 12  | 3       | 3   | 0    |
| 13              | 14  | 15  | 16  | 4       | 4   | 0    |
| 17              | 18  | 19  | 20  | 5       | 5   | 0    |
| 21              | 22  | 23  | 24  | 6       | 6   | 0    |
| 25              | 26  | 27  | 28  | 7       | 7   | 0    |
| 29              | 30  | 31  | 32  | 8       | 8   | 0    |
| 33              | 34  | 35  | 36  | 9       | 9   | 0    |
| 37              | 38  | 39  | 40  | 10      | 10  | 0    |
| 41              | 42  | 43  | 44  | 11      | 11  | 0    |
| 45              | 46  | 47  | 48  | 12      | 12  | 0    |
| 49              | 50  | 51  | 52  | 13      | 13  | 0    |
| 53              | 54  | 55  | 56  | 14      | 14  | 0    |
| 57              | 58  | 59  | 60  | 15      | 15  | 0    |
| 61              | 62  | 63  | 64  | 16      | 16  | 0    |
| 65              | 66  | 67  | 68  | 17      | 17  | 0    |
| 69              | 70  | 71  | 72  | 18      | 18  | 0    |
| 73              | 74  | 75  | 76  | 19      | 19  | 0    |
| 77              | 78  | 79  | 80  | 20      | 20  | 0    |
| 81              | 82  | 83  | 84  | 21      | 21  | 0    |
| 85              | 86  | 87  | 88  | 22      | 22  | 0    |
| 89              | 90  | 91  | 92  | 23      | 23  | 0    |
| 93              | 94  | 95  | 96  | 24      | 24  | 0    |
| 97              | 98  | 99  | 100 | 25      | 25  | 0    |
| 101             | 102 | 103 | 104 | 26      | 26  | 0    |
| 105             | 106 | 107 | 108 | 27      | 27  | 0    |
| 109             | 110 | 111 | 112 | 28      | 28  | 0    |
| 113             | 114 | 115 | 116 | 29      | 29  | 0    |
| 117             | 118 | 119 | 120 | 30      | 30  | 0    |
| 121             | 122 | 123 | 124 | 31      | 31  | 0    |
| 125             | 126 | 127 | 128 | 32      | 32  | 0    |
| 129             | 130 | 131 | 132 | 33      | 33  | 0    |

| Turnout numbers |     |     |     | Address | CV1 | CV 9 |
|-----------------|-----|-----|-----|---------|-----|------|
| 133             | 134 | 135 | 136 | 34      | 34  | 0    |
| 137             | 138 | 139 | 140 | 35      | 35  | 0    |
| 141             | 142 | 143 | 144 | 36      | 36  | 0    |
| 145             | 146 | 147 | 148 | 37      | 37  | 0    |
| 149             | 150 | 151 | 152 | 38      | 38  | 0    |
| 153             | 154 | 155 | 156 | 39      | 39  | 0    |
| 157             | 158 | 159 | 160 | 40      | 40  | 0    |
| 161             | 162 | 163 | 164 | 41      | 41  | 0    |
| 165             | 166 | 167 | 168 | 42      | 42  | 0    |
| 169             | 170 | 171 | 172 | 43      | 43  | 0    |
| 173             | 174 | 175 | 176 | 44      | 44  | 0    |
| 177             | 178 | 179 | 180 | 45      | 45  | 0    |
| 181             | 182 | 183 | 184 | 46      | 46  | 0    |
| 185             | 186 | 187 | 188 | 47      | 47  | 0    |
| 189             | 190 | 191 | 192 | 48      | 48  | 0    |
| 193             | 194 | 195 | 196 | 49      | 49  | 0    |
| 197             | 198 | 199 | 200 | 50      | 50  | 0    |
| 201             | 202 | 203 | 204 | 51      | 51  | 0    |
| 205             | 206 | 207 | 208 | 52      | 52  | 0    |
| 209             | 210 | 211 | 212 | 53      | 53  | 0    |
| 213             | 214 | 215 | 216 | 54      | 54  | 0    |
| 217             | 218 | 219 | 220 | 55      | 55  | 0    |
| 221             | 222 | 223 | 224 | 56      | 56  | 0    |
| 225             | 226 | 227 | 228 | 57      | 57  | 0    |
| 229             | 230 | 231 | 232 | 58      | 58  | 0    |
| 233             | 234 | 235 | 236 | 59      | 59  | 0    |
| 237             | 238 | 239 | 240 | 60      | 60  | 0    |
| 241             | 242 | 243 | 244 | 61      | 61  | 0    |
| 245             | 246 | 247 | 248 | 62      | 62  | 0    |
| 249             | 250 | 251 | 252 | 63      | 63  | 0    |
| 253             | 254 | 255 | 256 | 64      | 0   | 1    |
| 257             | 258 | 259 | 260 | 65      | 1   | 1    |
| 261             | 262 | 263 | 264 | 66      | 2   | 1    |
| 265             | 266 | 267 | 268 | 67      | 3   | 1    |
| 269             | 270 | 271 | 272 | 68      | 4   | 1    |
| 273             | 274 | 275 | 276 | 69      | 5   | 1    |
| 277             | 278 | 279 | 280 | 70      | 6   | 1    |

# Solenoid address & turnout numbers

| Turnout numbers |     |     |     | Address | CV1 | CV 9 |
|-----------------|-----|-----|-----|---------|-----|------|
| 281             | 282 | 283 | 284 | 71      | 7   | 1    |
| 285             | 286 | 287 | 288 | 72      | 8   | 1    |
| 289             | 290 | 291 | 292 | 73      | 9   | 1    |
| 293             | 294 | 295 | 296 | 74      | 10  | 1    |
| 297             | 298 | 299 | 300 | 75      | 11  | 1    |
| 301             | 302 | 303 | 304 | 76      | 12  | 1    |
| 305             | 306 | 307 | 308 | 77      | 13  | 1    |
| 309             | 310 | 311 | 312 | 78      | 14  | 1    |
| 313             | 314 | 315 | 316 | 79      | 15  | 1    |
| 317             | 318 | 319 | 320 | 80      | 16  | 1    |
| 321             | 322 | 323 | 324 | 81      | 17  | 1    |
| 325             | 326 | 327 | 328 | 82      | 18  | 1    |
| 329             | 330 | 331 | 332 | 83      | 19  | 1    |
| 333             | 334 | 335 | 336 | 84      | 20  | 1    |
| 337             | 338 | 339 | 340 | 85      | 21  | 1    |
| 341             | 342 | 343 | 344 | 86      | 22  | 1    |
| 345             | 346 | 347 | 348 | 87      | 23  | 1    |
| 349             | 350 | 351 | 352 | 88      | 24  | 1    |
| 353             | 354 | 355 | 356 | 89      | 25  | 1    |
| 357             | 358 | 359 | 360 | 90      | 26  | 1    |
| 361             | 362 | 363 | 364 | 91      | 27  | 1    |
| 365             | 366 | 367 | 368 | 92      | 28  | 1    |
| 369             | 370 | 371 | 372 | 93      | 29  | 1    |
| 373             | 374 | 375 | 376 | 94      | 30  | 1    |
| 377             | 378 | 379 | 380 | 95      | 31  | 1    |
| 381             | 382 | 383 | 384 | 96      | 32  | 1    |
| 385             | 386 | 387 | 388 | 97      | 33  | 1    |
| 389             | 390 | 391 | 392 | 98      | 34  | 1    |
| 393             | 394 | 395 | 396 | 99      | 35  | 1    |
| 397             | 398 | 399 | 400 | 100     | 36  | 1    |
| 401             | 402 | 403 | 404 | 101     | 37  | 1    |
| 405             | 406 | 407 | 408 | 102     | 38  | 1    |
| 409             | 410 | 411 | 412 | 103     | 39  | 1    |
| 413             | 414 | 415 | 416 | 104     | 40  | 1    |
| 417             | 418 | 419 | 420 | 105     | 41  | 1    |
| 421             | 422 | 423 | 424 | 106     | 42  | 1    |
| 425             | 426 | 427 | 428 | 107     | 43  | 1    |

| Turnout numbers |     |     |     | Address | CV1 | CV 9 |
|-----------------|-----|-----|-----|---------|-----|------|
| 429             | 430 | 431 | 432 | 108     | 44  | 1    |
| 433             | 434 | 435 | 436 | 109     | 45  | 1    |
| 437             | 438 | 439 | 440 | 110     | 46  | 1    |
| 441             | 442 | 443 | 444 | 111     | 47  | 1    |
| 445             | 446 | 447 | 448 | 112     | 48  | 1    |
| 449             | 450 | 451 | 452 | 113     | 49  | 1    |
| 453             | 454 | 455 | 456 | 114     | 50  | 1    |
| 457             | 458 | 459 | 460 | 115     | 51  | 1    |
| 461             | 462 | 463 | 464 | 116     | 52  | 1    |
| 465             | 466 | 467 | 468 | 117     | 53  | 1    |
| 469             | 470 | 471 | 472 | 118     | 54  | 1    |
| 473             | 474 | 475 | 476 | 119     | 55  | 1    |
| 477             | 478 | 479 | 480 | 120     | 56  | 1    |
| 481             | 482 | 483 | 484 | 121     | 57  | 1    |
| 485             | 486 | 487 | 488 | 122     | 58  | 1    |
| 489             | 490 | 491 | 492 | 123     | 59  | 1    |
| 493             | 494 | 495 | 496 | 124     | 60  | 1    |
| 497             | 498 | 499 | 500 | 125     | 61  | 1    |
| 501             | 502 | 503 | 504 | 126     | 62  | 1    |
| 505             | 506 | 507 | 508 | 127     | 63  | 1    |
| 509             | 510 | 511 | 512 | 128     | 0   | 2    |
| 513             | 514 | 515 | 516 | 129     | 1   | 2    |
| 517             | 518 | 519 | 520 | 130     | 2   | 2    |
| 521             | 522 | 523 | 524 | 131     | 3   | 2    |
| 525             | 526 | 527 | 528 | 132     | 4   | 2    |
| 529             | 530 | 531 | 532 | 133     | 5   | 2    |
| 533             | 534 | 535 | 536 | 134     | 6   | 2    |
| 537             | 538 | 539 | 540 | 135     | 7   | 2    |
| 541             | 542 | 543 | 544 | 136     | 8   | 2    |
| 545             | 546 | 547 | 548 | 137     | 9   | 2    |
| 549             | 550 | 551 | 552 | 138     | 10  | 2    |

# List of all supported CVs

| CV | Name                   | Description   | Range  | Value  |   |         |
|----|------------------------|---|--|--------|---|---------|
| 1  | Decoder address 1, LSB | Lower 6 bits (bit 0 - 5) of the first decoder address for outputs 1 to 4. Used together with CV 9 to save the address.  | 1 - 63   | 1      |   |         |
| 3  | Configuration Output 1 | Defines the properties of decoder output 1.   |  | 0 - 64 | 8 |         |
|    |                        | Function  | Description  |        |   | Value   |
|    |                        | Moment business   | K83-compatible: output active as long as the button on the control panel is pressed.       |        |   | 0       |
|    |                        | Impulse operation PECO  | Impulse operation for PECO drives. Reduces the sensitivity of the overcurrent protections. |        |   | 1       |
|    |                        | Impulse operation   | Duty cycle: multiple of 65 ms.   |        |   | 2 - 31  |
|    |                        | Alternating indicators  | Out A and Out B alternately active. Duty cycle: multiple of 130 ms.                        |        |   | 32 - 63 |
| 4  | Configuration Output 2 | Defines the properties of decoder output 2.   |  | 0 - 64 | 8 |         |
|    |                        | Function  | Description  |        |   | Value   |
|    |                        | - As CV 3 -   |  |        |   |         |
| 5  | Configuration Output 3 | Defines the properties of decoder output 3.   |  | 0 - 64 | 8 |         |
|    |                        | Function  | Description  |        |   | Value   |
|    |                        | - As CV 3 -   |  |        |   |         |
| 6  | Configuration Output 4 | Defines the properties of decoder output 4.   |  | 0 - 64 | 8 |         |
|    |                        | Function  | Description  |        |   | Value   |
|    |                        | - As CV 3 -   |  |        |   |         |
| 7  | Version number         | Internal software version of the decoder  |  | 194    |   |         |
| 8  | Manufacturer ID        | Manufacturer number (ID) of ESU. Writing the value 8 resets all CV to the factory setting.                              | -  | 151    |   |         |
| 9  | Decoder address 1, MSB | Upper 3 bits (bits 6 - 8) of the first decoder address for outputs 1 to 4. Used together with CV 1 to save the address. | 0 - 7  | 0      |   |         |

# List of all supported CVs

| CV | Name  | Description  | Range   | Value |   |              |
|----|---|--|---------|-------|---|--------------|
| 28 | RailCom Configuration   | Activation and configuration of the RailCom function   | 0,2     | 2     |   |              |
|    |   | <b>Bit</b>   |         |       | <b>Description</b>  | <b>Value</b> |
|    |   | 1  |         |       | Data transmission on channel 2<br>No data transmission on channel 2<br>Data transmission allowed on channel 2 | 0<br>2       |
| 29 | Configuration register  | DCC configuration settings for the SwitchPilot   | 128,136 | 128   |   |              |
|    |   | <b>Bit</b>   |         |       | <b>Description</b>  | <b>Value</b> |
|    |   | 3  |         |       | RailCom communication   |              |
|    |   |  |         |       | RailCom communication is switched off   | 0            |
|    |   |  |         |       | RailCom communication allowed   | 8            |
| 7  | Decoder is DCC Accessory Decoder (solenoid)<br>(read only, cannot be changed) | 128  |         |       |   |              |
| 34 | „Zoom“- Configuration   | Determination of which of the outputs 1 - 4 should „zoom“ when switched on / off. „Zoom“ means slowly fading in or out of the function. This can be used to create a prototypical cross-fading of light signals. | 0 - 255 | 0     |   |              |
|    |   | <b>Bit</b>   |         |       | <b>Description</b>  | <b>Value</b> |
|    |   | 0  |         |       | „Zoom“ function active for output 1   | 1            |
|    |   | 1  |         |       | „Zoom“ function active for output 2   | 2            |
|    |   | 2  |         |       | „Zoom“ function active for output 3   | 4            |
|    |   | 3  |         |       | „Zoom“ function active for output 4   | 8            |
|    |   | 4  |         |       | „Zoom“ function active for output 5   | 16           |
|    |   | 5  |         |       | „Zoom“ function active for output 6   | 32           |
|    |   | 6  |         |       | „Zoom“ function active for output 7   | 64           |
|    |   | 7  |         |       | „Zoom“ function active for output 8   | 128          |
| 35 | Decoder address 2, LSB  | Lower 6 bits (bit 0 - 5) of the second decoder address for outputs 5 to 8. Used together with CV 36 to save the address.   | 1 - 63  | 2     |   |              |
| 36 | Decoder address 2, MSB  | Upper 3 bits (bits 6 - 8) of the second decoder address for outputs 5 to 8. Used together with CV 35 to save the address.  | 0 - 7   | 0     |   |              |

# List of all supported CVs

| CV | Name                   | Description   | Range  | Value  |   |        |
|----|------------------------|---|--|--------|---|--------|
| 37 | DCC turnout addressing | Calculation of the turnout numbers from the decoder address                             |  | 0,1    | 0 |        |
|    |                        | Bit   | Description  |        |   | Value  |
|    |                        | 0   | DCC turnout addressing compliant with RCN-213<br>DCC turnout addressing for ROCO centers |        |   | 0<br>1 |
| 38 | Configuration output 5 | Defines the properties of decoder output 5.   |  | 0 - 64 | 8 |        |
|    |                        | Function  | Description  |        |   | Value  |
|    |                        | - As CV 3 -   |  |        |   |        |
| 39 | Configuration output 6 | Defines the properties of decoder output 6.   |  | 0 - 64 | 8 |        |
|    |                        | Function  | Description  |        |   | Value  |
|    |                        | - As CV 3 -   |  |        |   |        |
| 40 | Configuration output 7 | Defines the properties of decoder output 7.   |  | 0 - 64 | 8 |        |
|    |                        | Function  | Description  |        |   | Value  |
|    |                        | - As CV 3 -   |  |        |   |        |
| 41 | Configuration output 8 | Defines the properties of decoder output 8.   |  | 0 - 64 | 8 |        |
|    |                        | Function  | Description  |        |   | Value  |
|    |                        | - As CV 3 -   |  |        |   |        |
| 42 | Fadein / Fadeout Time  | Duration of the fade-in & fade-out process in 65ms steps, if configured for the output. |  | 0 - 63 | 2 |        |



## 17. Warranty certificate

Dear customer,

Congratulations on purchasing this ESU ECoS command station. This quality product was manufactured applying the most advanced production methods and processes and was subject to stringent quality checks and tests.

Therefore ESU electronic solutions ulm GmbH & Co. KG grants you a warranty for the purchase of ESU products that far exceeds the national warranty as governed by legislation in your country and beyond the warranty from your authorised ESU dealer.

### **Manufacturer's warranty of 24 months from date of purchase.**

#### **Warranty conditions:**

This warranty is valid for all ESU products that have been purchased from an authorised ESU dealer.

Any service, repair or replacement under this warranty requires proof of purchase. The filled in warranty certificate together with the receipt from your ESU dealer serves as proof of purchase. We recommend keeping the warranty certificate together with the receipt.

In case of a claim please fill in the enclosed failure report card as detailed and precise as possible and return it with your faulty product.

Please use the appropriate postage when shipping to ESU.

#### **Extend of warranty / exclusions:**

This warranty covers free of charge repair or replacement of the faulty part, provided the failure is demonstrably due to faulty design, manufacturing, material or transport. Any further claims are explicitly excluded.

The warranty expires:

- In case of wear and tear due to normal use.
- In case of conversions of ESU – products with parts not approved by the manufacturer.
- In case of modification of parts.
- In case of inappropriate use (different to the intended use as specified by the manufacturer).
- If the instructions as laid down in the user manual by ESU electronic solutions ulm GmbH & Co. KG were not adhered to.

There is no extension of the warranty period due to any repairs carried out by ESU or replacements.

You may submit your warranty claim either with your dealer or by shipping the product in question with the warranty certificate, the receipt of purchase and the fault description directly to ESU electronic solutions ulm GmbH & Co. KG at:

ESU GmbH & Co. KG  
- Guarantee Section -  
Edisonallee 29  
D-89231 Neu-Ulm

## 18. Change history

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### 1. EDITION DECEMBER 2020

- Initial Document

### 2. EDITION MARCH 2021

- Spelling mistake corrected



# Trouble shooting sheet

## 1. Personal data

(Please write in BLOCK LETTERS)

Name: ..... \_\_\_\_\_  
Street: ..... \_\_\_\_\_  
\_\_\_\_\_  
ZIP/City: ..... | | | | | |  
Country: ..... \_\_\_\_\_  
Email: ..... \_\_\_\_\_  
Phone: ..... \_\_\_\_\_  
Date: ..... \_\_\_\_\_  
Signature: ..... \_\_\_\_\_

## 2. Error

- |   |   |
|---|---|
| <input type="checkbox"/> Transistor outputs | <input type="checkbox"/> Short circuit              |
| <input type="checkbox"/> Servo outputs      | <input type="checkbox"/> No function from the start |
| <input type="checkbox"/> No Function        | <input type="checkbox"/> Programming on the Main    |

## 3. Error description

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## 4. Receipt

Please enclose your receipt / invoice. Otherwise no warranty possible!

## 5. Additional information:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_

## 6. Your retailer:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Retailer's stamp or address

