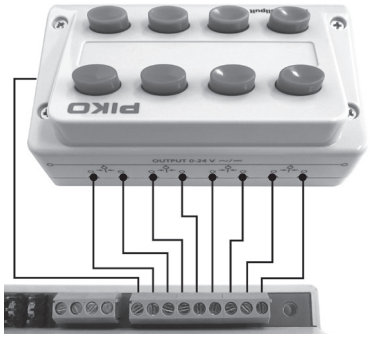
Analogue programming with PIKO Switch Control Box #55262

Connect the PIKO Switch Control Box as following:



The programming in analogue mode is similar to digital programming. Besides the two servo control buttons ("address") there are two more buttons necessary to act as [+] and [-].

To make things simple the switch control box has a fixed "logic" for programming as following:

red

green

Procedure of programming:

1. Touch the programming button and release again. The programming LED will shine permanently and the decoder is in programming mode now.
2. Touch one of the red buttons on the Switch Control Box. That will be "servo address 1 to 4". The decoder will confirm the "address" with a short shivering of the servo machine.
3. Setup the first stop position with [+] or [-] buttons
4. Confirm the first stop position with "OK"
5. Now setup the second stop position with [+] and [-]
6. As next you can setup the turning speed / setting time. After confirming the second stop position the decoder will permanently move the servo machine between the two stop positions. With [+] and [-] you can setup the speed then.
7. After setting the speed confirm with "OK" and the programming is finished. The entered values are stored permanently now. To setup the other servos repeat steps 1 to 7 with another red button at the beginning.

CV-schedule (Configuration Variables) of PIKO Switch Decoder for Servo Machines

Configuration of the Decoder

CV	Description		Value Range	Factory Default
112	**Software version** (the processor used can be updated)		-	varies
113	**Manufacturer code**		-	85
119	**Decoder Configuration**	Value	0-15	15
	Bit 0=0 Power Output 1 only on during servo movement	0		
	Bit 0=1 Power Output 1 always	1 *		
	Bit 1=0 Power Output 2 only on during servo movement	0		
	Bit 1=1 Power Output 2 always	2 *		
	Bit 2=0 Power Output 3 only on during servo movement	0		
	Bit 2=1 Power Output 3 always	4 *		
	Bit 3=0 Power Output 4 only on during servo movement	0		
	Bit 3=1 Power Output 4 always	8 *		

** denotes the factory default value*

Configuration of the Servo outputs

CVs for Servo outputs 1	2	3	4	Description	Value Range	Factory Defaults 1	2	3	4
120	130	140	150	**1. Address High-Byte**	0-6	0	0	0	0
121	131	141	151	**1. Address Low-Byte**	0-255	1*	2*	3*	4*
122	132	142	152	**Stop position "red" Address 1**	0-127	30	30	30	30
123	133	143	153	**Stop position "red" Address 1**	0-127	95	95	95	95
124	134	144	154	**Setting time / Turning time**	0-255	50	50	50	50

** When a Motorola center is used the factory programmed addresses are not usable and must be adjusted by the user via key programming.*

Technical note: Below a minimal turning speed the servo machine may show effects of jerky movement. To avoid that just setup a higher / faster turning speed.

Warranty Statement

Each component is tested for its complete functionality before distribution. If a fault should arise within the guarantee period of 2 years, we will repair the component free of Charge upon production of proof of purchase. The warranty claim is void if the damage was caused by inappropriate treatment.
Please note that, according to EMV regulation the component may only be installed in vehicles which carry the CE logo.

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#55274 PIKO Switch Decoder for Servo Machines

For connecting up to 4 PIKO Under Table Switch Machines #55272

Properties

- for Märklin* and DCC digital command stations
- switchable like a magnetic article decoder
- addresses for each servo machine freely choosable
- tunable stop positions
- tunable turning speed
- setup via solenoid controlling of the digital command station, via DCC-CV-programming or analogue with the help of the Switch Control Box #55262
- power supply via track or separate power supply
- very low power consumption by the help of integrated switch mode voltage regulator
- servo-machine outputs with overload protection

Description

The PIKO Switch Decoder for Servo Machines is used to control common servo machines that are known from RC-model market for use on model railroad layouts.
You can connect up to 4 pcs. PIKO Under Table Switch Machines # 55272 and control each one independently. The PIKO Switch Decoder for Servo Machines acts like a switch decoder in digital systems and each servo machine can be assigned with it's own address. By the help of the digital command signals the servo machine can then be moved into two different stopping positions. The PIKO Switch Decoder for Servo Machines works in DCC and Motorola systems.
The stopping positions "red" and "green" can be setup independently from each other. Furthermore the turning speed between both positions can be setup freely. With a simple solenoid-programming via the DCC or Motorola command station you can setup the address, the stopping positions and the turning speed. When using a digital command station like PIKO Smart Control, that supports DCC-CV-programming, all setups can be made via CV's, too.
Additionally an analogue programming and operation is possible in combination with PIKO Switch Control Box #55262.

Assembly of the PIKO Switch Decoder for Servo Machines

Connecting the PIKO Switch Decoder for Servo Machines

The connections "Gleis 1+2" (track 1+2) shall be connected with the track-outputs of the digital command station. In this case the PIKO Switch Decoder for Servo Machines will be powered via the command station.

Notice: We recommend to connect a 16 V power supply to the contacts "Trafo 1 + 2".

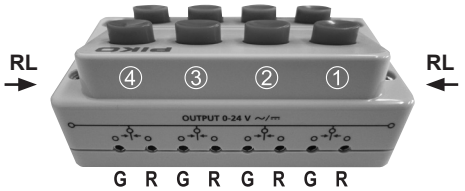
Connection of the servo machines to the PIKO Switch Decoder for Servo Machines

Each PIKO Switch Decoder for Servo Machines has four 3-pin connections for up to 4 servo machines.
The plugs of the servo machines should be plugged in with following alignment:
Data (white): towards frontside - power (5 V) center - mass (black) rearside inside housing)
Tipp: *If the distance between PIKO Switch Decoder for Servo Machines and the servo Switch machine is too long you can find extensions on the after sales market (RC hobby).*

Connections of the PIKO Switch Decoder for Servo Machines

1 - 1 red
2 - 1 green
3 - 2 red
4 - 2 green
5 - 3 red
6 - 3 green
7 - 4 red
8 - 4 green
9 - common return (**RL**)
A - trafo 1
B - trafo 2
C - track 1
D - track 2
S1 - Servo 1 + LED
S2 - Servo 1 + LED
S3 - Servo 1 + LED
S4 - Servo 1 + LED
PROG - prog-button + LED

Connections / Descriptions at PIKO Switch Control Box #55262



Digital Programming

The PIKO Switch Decoder for Servo Machines can be setup in Motorola or DCC-system via solenoid controlling menu or via DCC-CV-programming.
In analogue programming mode not all setups can be changed.

Programming by Key and Solenoid Command

All settings for the stop positions and the servo machine turning speed are easily set by the digital center, or another control device, with which one can control solenoids. The desired servos should be connected to the outputs that are to be programmed since the servo decoder acknowledges the setting of the servo parameters, during programming, with a movement of the respective servo.

1. Activating Programming Mode

Press the programming button on the decoder and keep it pressed. The control LED shines.

2. Selecting Data Format

DCC format is selected if the LEDs are blinking at servo output 1 and 2.
Motorola format is selected if the LEDs are blinking at servo output 3 and 4.
First the LEDs 1&2 are blinking and after some seconds the LEDs 3&4 and so on.
The programming button has to be pressed, if the LEDs show the required data format.
Note: *If the decoder no longer reacts to key inputs from the input device, the wrong data format was selected!*

3. Choose servo machine output to program

Press the key repeatedly until the LED of the servo machine on the desired output is shining.

4. Setup the solenoid address for the selected servo machine output

On digital center or another control device which can switch solenoids, operate one of the two keys (red or green) for controlling this servo later. The servo decoder confirms the command with a short shivering of the servo on this output.

5. Selecting solenoid keys for [+] and [-]

In order to be able to set up stops and the speed of the servo during programming, two keys must be specified which will be used as [+] and [-] key. From the digital center, or another control device which can switch solenoids, press the key which is to be used as [+] key. The solenoid address of this key must not be the same as the previously selected solenoid address. The servo decoder confirms the command with a short shivering of the servo on this output. In the same way, the key which is to be the [-] key is determined.
Note: *After programming, this allocation is deleted so that these keys can be used on the layout as normal.*

6. Setting the stop positions of the Servo machines

Using the address setup in step 4, the servo can now be moved to stop position “red” with the red solenoid key. With the help of the [+] and [-] keys, specified in step 5, the stop position of the Servos is adjusted accordingly. For this the [+] or [-] key is repeatedly pressed until the desired position is reached. With the green solenoid move the servo to the stop position "green" as described above.
When desired positions are fixed, the servo must be switched to the "red" and "green" stop positions 3 times (thus red-green-red-green-red-green) without changing the setting, in order to go to the next programming step (keys in accordance with step 4).

7. Setting the speed of the Servo machine

The servo machine now repeatedly moves back and forth with the set speed between the two stop positions. The speed of the movement can be increased or decreased with the [+]and [-] keys, specified in step 5.

8. Terminate Programming

When the desired speed is adjusted, one of the two keys which change the servo position is operated, (keys in accordance with step 4). Programming for this servo output is complete and the servo decoder is ready for the programming of the next output. The selected settings are permanently stored.
Note: *If the programming is terminated prematurely, as if the track power is switched off, then the selected settings are stored.*

CV Programming with DCC Devices

The decoder can be programmed with the PIKO Smart Control and any DCC center that permits 3 digit numerical values. Use the programming menu of your DCC center to select and program the decoder CVs. The exact process will be outlined in the center’s manual.

Connection of the servo decoder for programming

For programming the PIKO Switch Decoder for Servo Machines it must be individually connected to a programming

track. The desired servo machines are connected to outputs which are to be programmed.

Configuration of the PIKO Switch Decoder for Servo Machines

CV 119 is used to specify different decoder settings. If the power on the different servo outputs is always switched on or only during servo operation and if the operating mode is Motorola or DCC: The entered value is calculated from the CV table in which the values of the desired functions are added.
Example
Output 1 power always on value = 1
Output 2 power always on value = 2
Output 3 power always on value = 4
Output 4 power always on value = 8
Operating mode DCC value = 0
Sum of all values is always 15. This value is preset in CV 119 by the factory.

Bit	Function CV 119	Value
0	**Power Output 1** only on during servo movement immer always	0 1*
1	**Power Output 2** only on during servo movement immer always	0 2*
2	**Power Output 3** only on during servo movement immer always	0 4*
3	**Power Output 4** only on during servo movement immer always	0 8*

Setting time / turning speed (CV 124)

Time constant by which servo position is incremented or decremented in 1 ms steps.
Process time = (difference between "red" and "green" values) * setting time * 1 ms

$$\text{Setting time} = \frac{\text{desired turning time in seconds} * 1000}{\text{difference of the stop positions red and green}}$$

Programming with PIKO SmartControl

Before programming you need to setup a new Switch Panel in the PIKO SmartControl App. This Switch Panel must include the addresses for the servo machines to be programmed and additional two more items, with two additional, different addresses. These two additional addresses will act as [+] and [-] during the programming.
Example: You want to connect two servo machines on contacts "servo 1" and "servo 2" and give those servos the new addresses 21 and 22. As [+] and [-] buttons we will use digital addresses "23" and "24" in this example.

1. Create four new accessory items that are saved with the addresses mentioned above.
2. Put those four items into a new Switch Panel and safe it.
3. Press the programming button and keep pressed. The control LED will start to shine and you can choose the data format for programming
4. Choose Data Format
   DCC format is selected if the LEDs are blinking at servo output 1 and 2.
   Motorola format is selected if the LEDs are blinking at servo output 3 and 4.
   First the LEDs 1&2 are blinking and after some seconds the LEDs 3&4 and so on.
   The programming button has to be pressed, if the LEDs show the required data format.
   Note: *If the decoder no longer reacts to key inputs from the input device, the wrong data format was selected!.*
5. Choose servo output for programming
   Press the key repeatedly until the LED of the servo machine on the desired output is shining.
6. Now touch the accessory item in PIKO SmartControl Switch Panel that is stored with address "21". The decoder will confirm the new address with a short shivering of the servo 1.
7. As next, touch the accessory stored with address "23" to setup the [+] button. The decoder will confirm this address with a short shivering of servo 1.
8. Then, touch accessory stored with address "24" to setup the [-] button. Decoder will confirm with short shivering.
9. Now the stopping positions right and left will be setup:
   Setup of the first position:
   The programming will start "from the center position" of the servo machine (center between maximum positions). Depending on the assigned symbol (f.e. "switch right") please take care for the correctness of the symbol. Depending if the switch is "open" or "closed" the programming should start to left or right ([+] or [-] direction).
   Setup of second stop position:
   Touch the symbol with address "21" (servo 1) to move it into it's other position (in this case: back to center after first position is setup). Now repeat step 9 again to find the second stop position.
10. Setup of setting time / turning speed:
    Touch the symbol with address 21 (servo1) 6 times now, so that the servo will move 3 cycles. The decoder will confirm the position and start to move the servo machine repeatedly between those positions to setup the speed. With the buttons for [+] and [-] ("23 and 24") you can setup the speed then.
11. For finishing the programming, touch Servo 1 / Address 21 six times again (3 cycles). The decoder will stop to move the servo and the programming LED will stop to shine. Programming is finished and the values are stored permanently.
    Note: If a power-off appears during the programming the values will not be stored. Programming must be repeated then.
12. Programming of servo machine 2 to new address 22: Repeat the points 5 to 11 with the new address "22" in the PIKO SmartControl Switch Panel.

On our FAQ-pages under www.piko-shop.de you can find a tutorial video of the programming procedure, too.