

CV-Table

CV	Description	Area	Value*
1	Locomotive address	DCC: 1 - 127 Mot: 1 - 80	3
2	Minimum speed (the speed from 0 until the locomotive is running at speed step 1)	0 - 255	0
3	Acceleration delay	0 - 255	60
4	Braking rate	0 - 255	80
5	Maximum speed (must be greater than CV 2)	0 - 255	255
6	Average speed (must be greater than CV 2 and less than CV 5)	0 - 255	85
8	Manufacturer identification decoder reset CV8 = 8	-	162
12	Operating modes Bit 0=1 DC (analog operation DC) on Bit 2=1 Data format DCC on Bit 4=1 AC (analog operation alternating current) on Bit 5=1 Data format Motorola® on Bit 6=1 Data format mfx® on	Value *1 *4 *16 *32 *64	0 - 117 117
17	Long locomotive address 17 = higher value Byte	1 - 10239	1000
18	18 = lower value Byte	192 - 231 0 - 255	195 232
27	Brake signal settings (automatic stop) Bit 0 = 1 -> ABC right rail more positive Bit 1 = 1 -> ABC left rail more positive Bit 4 = 1 -> DC with direction of travel opposite Bit 5 = 1 -> DC with direction of travel equal	Value 1 2 16 32	0 - 51 0
29	DCC standard configuration Bit 0=0 Normal direction of travel Bit 0=1 Opposite direction of travel Bit 1=0 14 Speed steps Bit 1=1 28 Speed steps Bit 2=0 DCC-only mode Bit 2=1 Automatic analog/digital recognition Bit 3=0 RailCom® turned off Bit 3=1 RailCom® turned on Bit 4=0 Speed steps over CV 2, 5, and 6 Bit 4=1 Use the characteristic curve from CV 67 - 94 Bit 5=0 Short address (CV1) Bit 5=1 Long address (CV 17/18)	Value *0 1 0 *2 0 *4 0 *8 *0 16 *0 32	0 - 63 14
30	Error codes for function outputs, motor, and temperature monitoring: 1 = fault motor, 2 = overheating, 4 = fault function outputs	0 - 7	0
202	Servo 1, speed	0 - 255	40
203	Servo 1, stop position 1	0 - 128	210
204	Servo 1, stop position 2	0 - 128	190
208	Servo 2, speed	0 - 255	32
209	Servo 2, stop position 1	0 - 128	60
210	Servo 2, stop position 2	0 - 128	100
251	Energy storage Buffer time in 500ms steps Bit 0 - 3, energy storage switched on Bit7 = 1	0 - 143	132

* factory set values



#36520 PIKO SmartDecoder XP Sound G
for railcar BR 491 "glass train"
Multiprotocol incl. mfx®- feature



NOTE: Complete operating instructions for the PIKO SmartDecoder XP Sound G can be found on the PIKO website as a PDF file. Each aspect of the PIKO SmartDecoder XP Sound G is explained in detail.

Product Description

The PIKO SmartDecoder XP Sound G is a compact, yet powerful, state-of-the-art multi-protocol sound decoder built specifically for G scale applications. The decoder features a plug-and-play design that installs instantly on a G scale circuit board. This type of interface eliminates the task of having to solder and unsolder wires in the event you want to change out a decoder. The PSD XP Sound G features full 12 bit, 8 channel sound, a high audio sample rate, 128Mbit (480 seconds) memory, and a 7 Watt output; guaranteeing a static-free sound experience. It complies with all current RCN standards and can be used on DCC, mfx® and Motorola® digital systems as well as AC or DC analog layouts. The decoder is RailCom® and RailCom Plus® compatible, meaning it will automatically recognize what type of DCC system it is being used on. The PIKO SmartDecoder XP Sound G recognizes automatic braking track sections (automatic block control), ABC shuttle train operation, and has a wide range of settings that can be configured for maximum realistic train control. Each XP Sound G decoder features load-dependent sound that is governed by a completely new motor control system built to deliver silky smooth running characteristics for DC and bell armature motors that tolerate a continuous current consumption of 5 A. The motor speed curve can be set via minimum, medium, and maximum speed curves or with an extended speed curve of 28 speed steps. The decoder features two directional lighting outputs as well as twelve amplified function outputs that can be activated by function keys from F0 to F68 (in DCC). Up to 10 of those outputs are capable of output logic levels. The decoder has the potential to operate up to four servos that can be attached to the model's circuit board. The XP Sound G features a switching (shunting) gear with extended slow-speed operation, three possible start-up and braking delays, as well as a host of prototype-specific sounds. Sound files can be programmed to control specific function outputs as well as motor characteristics. For example, the headlights of a diesel locomotive can flicker to life when the engine is started. Thanks to advanced power management and sizeable "keep-alive" capacitors, the PIKO SmartDecoder XP Sound G will keep your model running over dirty track or when power is disrupted to the layout.

Installing the PIKO SmartDecoder XP Sound G

Carefully remove the dummy plug from the model's circuit board. Attach the sound decoder to the circuit board. Due to its design, it can only be attached in the correct position. Nonetheless, please make sure that the pins line-up with the holes. Now install the speaker in its housing as shown in the "Installation instructions" graphic. Make sure there are no crossed wires or short circuits, even when the locomotive shell is reattached to the chassis. The model is now ready for the programming track. Your DCC system's programming mode should now be in operation. When reading out a CV value or programming, very small currents usually flow through the model which in no way affect the decoder.

Function outputs A1 to A12

Outputs A1 to A12 of the sound decoder can only be activated if their associated functions (sound, light, or mechanical) are connected to the circuit board. Detailed information on all of the circuit board's output connections can be found in the operating instructions.

First time use of the decoder

Enter address 3 on your DCC system's control panel. Depending on the data format used, the model will run in 28-step DCC mode or Motorola mode. When using a RailCom Plus-compatible® digital control system or an mfx-compatible® digital control system, the decoder will automatically log on to your control system and can be operated immediately.

If the decoder is used on an analog layout, it can be operated with a traditional DC or AC throttle. The decoder automatically senses whether the layout uses digital or analog control.

NOTE: In DC analog mode, your model will only start at a higher voltage than you may be used to. The throttle needs to be turned up half-way or more for the model to begin moving.

Function outputs in analog mode

It is possible to program the sound decoder so that functions F0 - F12, as assigned in function mapping, can also operate in analog mode. To do this, CVs 13 & 14 must first be programmed with a digital control center. The corresponding values can be found in the CV table of the operating instructions. F0 (headlight), F1 (engine sound), F4 & F5 (interior lighting), F6 & F7 (control stand lights), and F9 (tail lights) are all factory-programmed to operate in analog mode.

Motorola® DCC format

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Configuration CVs

In addition to a decoder's address, the configuration CVs are the most important CVs of a decoder. In the PIKO SmartDecoder XP Sound these are CVs 12 and 29. A configuration CV contains basic settings for a decoder such as direction of travel. Detailed information on configuration CVs is found in the operating instructions.

RailCom®, RailCom Plus®

In the PIKO SmartDecoder XP Sound, RailCom® can be switched on or off in CV 29.

When RailCom Plus® is activated in CV 28, the decoder automatically sends its address, locomotive symbol, and



function icons to a RailCom Plus®-capable DCC command center and its function symbols will appear on the control screen within a few seconds. With RailCom Plus® technology, no locomotive data has to be stored in the command center and no locomotive addresses have to be programmed into the decoder.

mfX®

The PIKO XP SmartSound Decoder is also configured for the mfX® data format. If your DCC system is mfX-capable, the decoder will automatically transmit its locomotive symbol, decoder address, and function icons to your command center. As is the case with RailComPlus®, there is no need to store any locomotive data in the control center or assign an address to the decoder.

Brake settings

The Sound decoder responds to the following braking techniques:

- Märklin® braking track (train brakes when entering a track fed by analog DC voltage)
- DCC brake signal
- ABC (Automatic Block Control) brakes

The sound decoder can be programmed to bring the train to a stop at a precise point on your layout by setting an adjustable braking distance. More information on the subject of brake settings can be found in the operating instructions.

Function outputs

A comprehensive list of all possible function outputs can be found in the operating instructions.

Simple and Extended function mapping

In simple function mapping (controlled by CVs 33 - 46), switchable functions like lighting and sound can be freely assigned to function keys F0 to F12. Switchable functions like acceleration and braking delay can be assigned to any function key by using CVs 156 and 157. More information can be found in the operating instructions.

Electric coupler control

Digital electric couplers are activated by fine copper wire windings that raise or lower the couplers. The wire windings become relatively hot when exposed to continuous electric current. With the appropriate settings, the decoder will ensure that function outputs A4 and A5 (automatic coupler functions) shut off after a certain amount of time (thus preventing damage to the windings) without having to switch off the function key.

Switching (shunting) scenario, automatic coupling/uncoupling movement

If the electric coupler function is activated, you can set up a switching scenario.

Here is how it works:

1. The locomotive shoves (pushes) against the cars. The shoving motion is carried out at an adjustable speed step for an adjustable time.
2. The locomotive stops and switches its direction of travel yet does not move.
3. The locomotive's coupler uncouples from the car it was coupled to, and the locomotive backs away from the cars it just uncoupled from. The speed step and running time of this move are both adjustable.
4. The locomotive now stops, and then resumes its original direction of travel.

Extended Function Mapping

The enormously complex nature of extended function mapping makes it difficult to program each individual CV to achieve proper functioning results. If you want to change settings in extended function mapping, we highly recommend you use the PIKO SmartProgrammer (#56415) and (optionally) the PIKO SmartTester (#56416). For more information on advanced function mapping, please refer to the operating instructions.

Servo control

The sound decoder allows for direct control of four servo motors via their servo terminals on the circuit board. Servo 1 is located on the top of the board and Servo 2 is located on the bottom. Servo 1 controls the single-arm pantograph on the front of the railcar and Servo 2 controls the scissor pantograph on the rear of the car. Each servo is factory set to the maximum holding positions for each pantograph (value of 128). The setting options for the pantograph holding positions and their respective speed of operation can be found in the CV table. Assigning pantograph control to a certain function key is carried out in extended function mapping.

Sound settings

The overall volume level can be set using the volume pot located on the model's underbody. Reed contacts #1 and #2 are installed in the lead truck and they trigger the air whistle and horn when traveling over track magnets you can place strategically on your layout.

NOTE: To install a PIKO sound file on the sound decoder, you will need to use the PIKO SmartProgrammer (#56415) and (optionally) the PIKO SmartTester (#56416).

All further information on the PIKO SmartDecoder XP Sound G and its setting options are found in the operating instructions.

"Keep-alive" capacitor

The "keep-alive" capacitor installed in the decoder can be switched on or off via CV programming. The "keep-alive" run time is adjustable in 500ms steps for up to up to 8 seconds of power after power has been cut to the model. When CV 251 = 128 (Bit 7 = 1), the capacitor is activated and provides additional run time in 500ms segments. Bits 0 – 3 control the additional run time and can be increased in value to support run time up to 8 seconds.

NOTE: If you want to set this value higher, please keep in mind that in case of an "emergency stop" of the control center (the track voltage is switched off), the car will continue to move for this time.

Decoder factory reset

To reset the sound decoder back to factory settings, program CV 8 to a value of 8.

Programming

Configuration variables (CVs) form the basis of all decoder settings. The decoder can be programmed with the PIKO "Navigator" G scale digital control system or another DCC control system.

For more information on programming options, please refer to the operating instructions.

Function key assignment

F0	Headlight	F9	Tail light (red)	F18	Conductor's whistle
F1	Engine	F10	Cab lighting #1	F19	Long whistle
F2	Short Horn blast	F11	Cab lighting #2	F20	Short whistle
F3	Long Horn blast	F12	Front pantograph	F21	Bell
F4	Interior lighting #1	F13	Rear pantograph	F22	Handbrake
F5	Interior lighting #2	F14	Door	F23	Rail clank
F6	Control stand lighting #1	F15	Air compressor	F24	Flange squeal
F7	Control stand lighting #2	F16	Train announcement #1		
F8	Switching gear (shunting gear)	F17	Train announcement #2		

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RailCom® and RailComPlus® is a registered trademark of Lenz Elektronik GmbH

NOTE: This product is not a toy and is not for children under the age of 14. Any warranty for damages of any kind caused by incorrect use, as well as by non-compliance with these instructions, is excluded.

Wenn Sie Fragen haben, wir sind für Sie da!

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Service: In the event of a defective decoder, please return the decoder module to PIKO along with proof of purchase, the decoder address, and a short description of the problem.

Warranty Statement

Each decoder module is fully tested before shipment. Nevertheless, should a malfunction occur within the 2-year warranty period, we will repair the module free of charge on presentation of the proof of purchase. This warranty is voided if the unit has been damaged by improper use. Please note that, according to the German Electromagnetic Compatibility Law (EMVGesetz), the decoder module may only be used inside models bearing the CE mark.

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