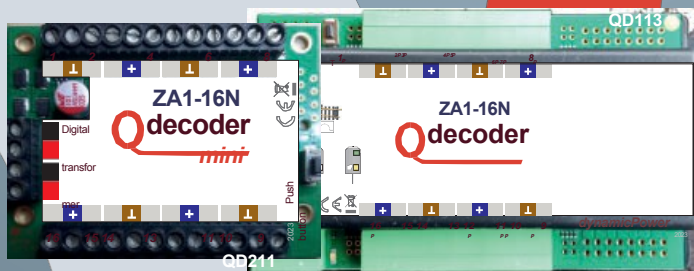
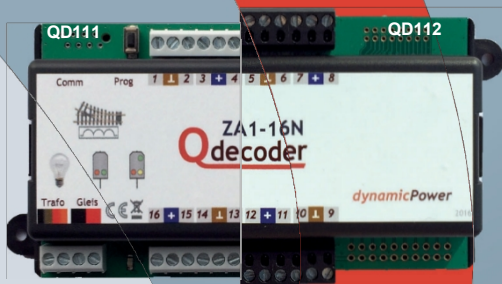
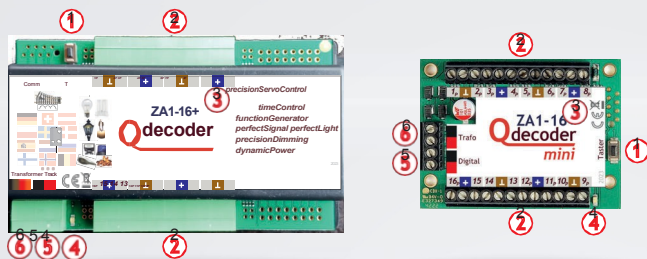


QD111
QD112
QD113
QD211



Qdecoder

The all-rounders



- ① The button is used to reset and program the decoder.
- ① The components to be controlled are connected to the function terminals labelled 1 to 16.
- ② Precision connections are marked with a "P".
The blue "+" connection is usually used as a common return conductor.
- ③ The LED is used to indicate operating states.
- ④ The digital signal must be connected to the *track* terminals. All cables should be twisted.
- ⑤ The decoder receives its power via the *transformer* connections. Either the transformer connection is also connected to the digital signal or to a transformer or power supply unit with a voltage between 12 and 18 V.

To program the decoder on the programming track, the *transformer* and *track* terminals must be connected together to the programming track connection on some control units.

! The function connections are not protected against short circuits with the track signal! A short circuit with the track signal can destroy the decoder.

CONNECTIONS

Accessory addresses, switching commands and switching modes

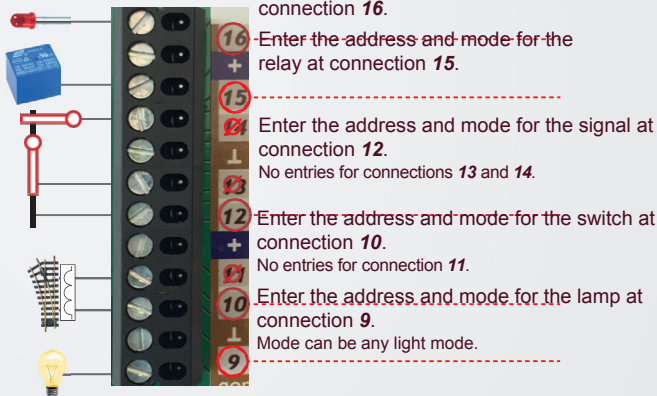
Qdecoders of the ZA series are delivered as accessory decoders. The outputs are switched on, off or changed by switching commands from the digital control centre. The response triggered by a switching command is determined by the switching modes of **the Qdecoders**, which are briefly described in this manual.

Two settings must be made for each signal, each turnout, each individual lamp, etc.:

- the accessory address A_z , under which it is switched, and
- the switching mode M , which determines how the switching is performed. All switching modes can be mixed on a **Qdecoder**.

A detailed introduction to switching modes and accessory commands is included in the **Qdecoder** manual. The configuration variables in which M and A_z are entered are listed on the "CV Set" page.

An example:



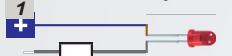
Most signals, switches and individual consumers are connected to the blue-marked return conductor.

Signals equipped with LEDs, LED strips or multi-coloured LEDs can only be controlled against the blue return conductor if they have a common positive pole (the anodes of the LEDs are connected together at one connection). LED modules and multi-coloured LEDs are commercially available with both a common cathode and a common anode. Signals usually have a common anode.

Consumers can be operated at any connection of a **Qdecoder**. In the following examples, they are always shown at connection **1** (and the following connections) for the sake of simplicity.



Lamps or LEDs with series resistor (e.g. with any light modes)



RGB LEDs with common anode on three connections – each with series resistor



Any light signals with incandescent lamps or LEDs with a common anode.



Relays

Observe the voltage range!

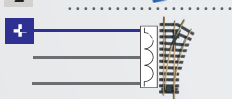


Magnetic items

e.g. points or semaphore signals



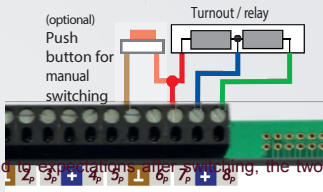
Lamps that are constantly switched on (or LEDs with series resistors)



SWITCH



The two coils of a changeover relay or a magnetic turnout or signal drive are connected to two consecutive connections on the decoder. The return conductor of the two coils is connected to one of the blue terminals **+**.



If the switch position does not correspond to expectations after switching, the two connections must be swapped.

A single relay is connected between one of the function outputs **1** to **16** and one of the blue terminals **+** as the return conductor.

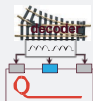
Relays, turnouts and semaphore signals can be switched manually or remotely using push buttons, reed relays or light barriers connected in parallel to the decoder output.

Do not use switches that switch against the track or digital signal or another supply voltage, especially track contacts. You risk destroying the decoder. Connect additional switches **exclusively** to the brown terminals.

! When using additional switches, we recommend the use of relays or turnouts with limit switches to prevent excessive loading of the coils due to excessive switching pulses.



Pulse duration	pulse duration				continuous operation	DCC off
	¼ s	½ s	1 s	2 s		
20	21	22	23	42	24	
25	26	27	28	41	28	



DCC off: Duration is set at the control station
 DCC off: control station handles pulse duration















LIGHTS AND LEDs

Individual lamps and LEDs are connected between one of the function outputs **1** to **16** and one of the blue terminals (+).

! LEDs require series resistors. Operating without series resistors may result in immediate destruction of the LEDs. Before commissioning, always check whether series resistors are already integrated in the connected signal model, etc.

SIMPLE SIGNALS

Modes **2**, **3** and **19** can be used for simple signals with up to three signal patterns. They enable the signal patterns to be switched, but do not offer the switching relay simulation of the special light signal modes of the all-rounder decoders.

Mode	Connections <i>connections</i>	Switching state		
		Address ■	Address ■	Address+1 ■
1				-
2				-
3				
19				

Configuration variables of a Qdecoder

2 Default values for configuration variables are highlighted in colour.

CV values highlighted in grey cannot be changed.

Operating mode and address

The address and operating mode can be entered independently of each other in CVs for each connection. The addresses are stored in 2 CVs, which are designated LSB and MSB. The address is distributed as follows:

- : Address / 256 is entered in MSB
- : Address - (MSB * 256) is entered in LSB

		CV addresses for the connections															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Address	MSB	9	551	554	557	560	563	566	569	572	575	578	581	584	587	590	593
	LSB	1	552	555	558	561	564	567	570	573	576	579	584	585	588	591	594
Operating mode		550	553	556	559	562	565	568	571	574	577	580	583	586	589	592	595
Address		Standard values															
		1	-	2	-	3	-	4	-	5	-	6	-	7	-	8	-
Fashion M		20	-	20	-	20	-	20	-	20	-	20	-	20	-	20	-

The important configuration variables **CV550** to **CV571** can also be read and written via addresses in the low address range.

Original CV address	Additional CV address	Content of CV
550	70	Switching mode for connection 1
555	71	Accessory address for connection 2
552	72	
...	...	
571	91	Switching mode for connection 8

CV	CV value	Meaning
7	8 or higher	Software version
8	55	Manufacturer identification
<p>Writing CV8=8 resets the decoder to factory settings. Writing CV8=7 deletes any overcurrent that has occurred. Writing CV8=6 switches off all function outputs. Writing CV8=1 copies the mode and address from function connection 1 to all other function ports.</p>		
15	0	Decoder lock comparison value
1	0	Decoder lock configuration value
<p>If CV15 and CV16 have different values, CV access commands are not executed. CV15 and CV16 remain writable.</p> <p>When CV15=255, the programming button, the reset button and the reading and writing of configuration variables other than CV15 are disabled. When CV15=254, (only) the programming button and access to CVs are disabled.</p>		
99	0	CV address offset (for the Lokmaus – see below)

CV99 is used for systems in which no CVs above 100 can be addressed. In **CV99**, an offset is defined which is added to the CV address during CV accesses if the transferred address is greater than 99. No offset is added for addresses up to 99, so that **CV99** itself can be changed at any time. Some examples illustrate the calculation of the actual CV address:

CV99	Offset	CV address of the read or write command	read or written CV
0	0	1	1
		99	99
		100	100
		255	255
1	100	1	1
		99	99
		100	200
		255	355
...			



Problems with accessory addresses in some systems

- ! Roco's Lok and Multimaus, as well as some Lenz control centres, transmit accessory addresses reduced by the value 4. For example, if the address "1" is entered in the decoder, it responds to switching commands from address "5".

Resetting to factory settings

Sometimes it is desirable to reset a Qdecoder to the factory settings. This can be achieved with the button (if available) or by writing an "8" on CV8.

All individual settings will be lost.

If a **Qdecoder** is to be reset to the factory settings using the button, it must be pressed for 10 seconds. Observe the LED:

- After 1 second, the LED lights up continuously and the decoder switches to programming mode if necessary.
- After approx. 5 seconds, the LED will start flashing. The flashing will become faster and faster until the LED goes out after approx. 10 seconds. The decoder has been reset to its factory settings.



Overload, short circuit and consequences

Qdecoders are protected against short circuits at the function outputs and against overload. In the event of a short circuit (the current rises above the maximum permissible value), the outputs of the decoder that are currently switched on are switched off and can only be reactivated after the decoder overcurrent (see below) has been reset.

If a short circuit or overcurrent is detected, the LED of the decoder flashes once for each function output (**1** to **16**) and then pauses briefly. Short flashing pulses indicate non-critical outputs, while a long flashing pulse indicates a function output that needs to be checked. With F decoders, the outputs that are not affected flash.

In this case, you should

- Eliminate the short circuit.
- Press the button briefly. Alternatively, you can briefly switch off the layout using the stop button on the control centre or write the value "7" to CV8.

Qdecoders are not intended as toys for children under 14 years of age.

They are not suitable for children under 3 years of age due to small parts that could be swallowed.

Improper use may result in injury due to functional edges and points! For dry rooms only. We reserve the right to make errors and changes due to technical progress, product maintenance or other manufacturing methods. We accept no liability for damage or consequential damage resulting from improper use, failure to observe these instructions for use, operation with transformers or other electrical devices that are not approved for model railways, have been modified or are defective, unauthorised tampering, the use of force, overheating, exposure to moisture, etc.; Furthermore, the warranty claim shall expire in such cases. Decoders that are no longer required can be returned free of charge to municipal collection points for electronic waste.

Please keep these operating instructions for future reference!



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
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THE ALL-ROUNDERS



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Light signals and lights

-  Magnetic drives Points and semaphore signals
-  Motor and servo-driven points and model motors
- 