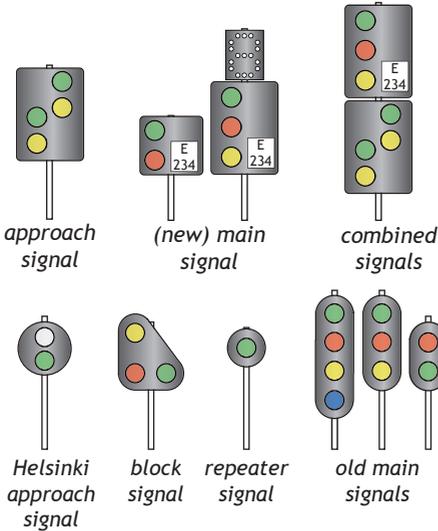


5.20. FINNISH SIGNALS

! To control Finnish signals directly you need a Qdecoder with **Signal** extension for Finnish signals.

5.20.1. MAIN SIGNALS

The Finnish main signalling system is a classical one consisting of main and approach signals. The main signal gives the driver information on the track segment behind the signal. Approach signals are used to inform about the state of the following main signal.



An approach signal gives always the same aspect as the following main signal. In the Helsinki City area older signal types are still in use.

If the main signal is hard to be seen between the approach and the main signals (e.g. at a station) a repeater signal can be used to repeat the announcing. Repeater signals are used in the Helsinki area only. Block signals are used outside the stations.

SIGNAL ASPECTS

Finnish main, approach and repeater signals can show the following aspects:

stop					
go 35 km/h					
go					
drive care- fully	-		-	-	-

In combinations of main and approach signal the approach signal is off as long as the main signal shows "stop".

Block signals combine approach and main signal information into one background. They differentiate between stop and go aspects only. A speed limitation can not be signalled.

stop	
go, expect go	
go, expect stop	

ADD ON SIGNAL

There is an add on signal to give additional speed information. The shown figure is 1/10th of the signalled speed ("8" means 80 km/h).

The signal shows white light and is mounted above the main background on main signals. On approach signals it shows yellow light and is mounted below the

Signal ✓
 Ampel ×
 Licht ×

Basis × base class
 Standard × standard class
 Alleskönner × all-in-one class

approach signal background.

description	signal
indicated speed allowed	
A disturbed (dark) signal is of course no add-on signal, but an error. Qdecoders can switch to a dark background by an accessory command.	

CONTROLLING FINNISH SIGNALS

The accessory address of the signal A_{signal} is written to the address configuration variable relating to the first function output the signal is connected to. Two addresses (A_{signal} and $A_{\text{signal}} + 1$) are used for switching of signal aspects typically.

command	aspect
A_{signal}	stop
A_{signal}	go
$A_{\text{signal}} + 1$	go 35 km/h

Main Signals (old and new)

mode		2	19	91
function outputs	1			
	2			
	3	-	-	
	4	-	-	
control commands				
A_{signal}	stop			
A_{signal}	go			
$A_{\text{signal}} + 1$	-	go 35 km/h		
$A_{\text{signal}} + 1$	-	-	drive carefully	

New Approach Signals

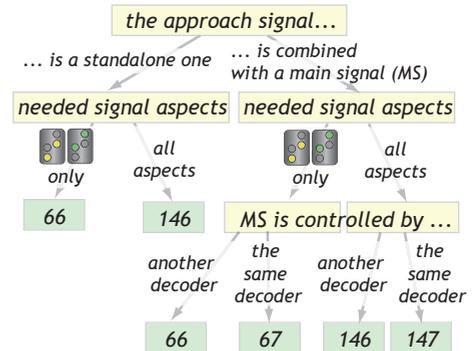
Approach signal can be combined with a main signal or standalone. If combined with a main signal they remain dark as long as the main signal shows "stop" aspect. To realize the dark signal the decoder needs information on the main signal aspect. That signal is either connected to the same decoder the approach signal is or

to another decoder. In the latter case the decoder has to collect and store the main signal switching information itself.

Qdecoders offer two variants of approach signal control:

- Mode TODO and TODO: the "normal" approach signal needs four function outputs - one for each of the signal bulbs - to control all three possible signal aspects.
- Mode TODO and TODO: in case the "expect go 35 km/h" aspect is not needed a reduced effort is sufficient. Both yellow bulbs can be connected to the same function outputs - and the green ones can be combined too.

Qdecoders have a total of four modes for Finnish approach signal control. Please select the one you need based on the following figure:



mode		92	93	94	95
addresses	A ₁	A _{signal}			
	A ₂	A _{main}	-	A _{main}	-
function outputs	1				
	2				
	3	-			
	4	-			
control commands					
A _{signal}		expect stop			
A _{signal}		expect go			
A _{signal} +1		-		expect go 35 km/h	
A _{signal} +1		-		expect stop	
A _v		(dunkel)			

The accessory address of the approach signal A_{signal} is in any mode stored in the address CV of the first function output of the signal.

For standalone approach signals the decoder does not need further configuration.

If the approach and the main signal of a signal combination has to be controlled by different decoders for output count reasons mode TODO or TODO is used for the approach signal. The address A_{main} of the main signal of a signal combination is written to the address configuration variables of the second function output of the approach signal.

If the combination can be controlled by the same decoder (modes TODO and TODO) the approach signal is connected to the function output that follow the main signal's outputs immediately.

Old Approach and Repeater Signals

mode		96	97
function outputs	1		
	2		-
control commands			
A _{signal}		expect stop	
A _{signal}		expect go	
A _{signal} +1		expect go 35 km/h	

Block Signals

mode		3
function outputs	1	
	2	
	3	
control commands		
A _{signal}		stop
A _{signal}		go, expect go
A _{signal} +1		go, expect stop

Add-On Signals

Add-on signals are connected to the function output of the decoder that follows the outputs used for the main signal directly. A main signal can be combined with any number of add-on signals.

mode		206	218
function output	1		dark signal
control commands			
A _{addOn}		off	signal is on
A _{addOn}		on	signal is off

Mode 206: The add-on signal is associated with aspect "go 35 km/h". If the add-on signal is switched on while the main signal shows another aspect the main signals switches to "go 35 km/h" automatically. Changing the main signal aspect to any other aspect than "35 km/h" will switch off the add-on signal.

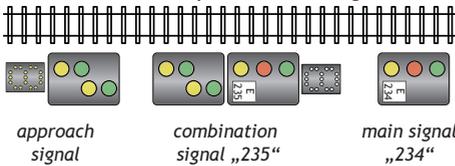
Signal ✓
 Ampel ×
 Licht ×

Basis × base class
 Standard × standard class
 Alleskönner × all-in-one class

Mode 218: The disturbed signal is switched on and off using commands of an accessory address that is written to the address configuration variable of any function output the signal is connected to.

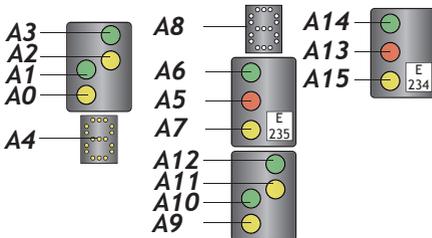
AN EXAMPLE

Let us have a look on the following track. The example is not a real life one but illustrates the way signals are controlled using Qdecoders. A main signal "234" is at the end of the track. The approach signal for signal "234" is combined with main signal "235" that has an speed add on signal.



The signals have a total of 16 bulbs. We choose a Z1-16 with **Signal** extension. Signal "234" shall be controlled by commands of accessory address 1, accessory address 3 is used for signal "235". The speed add on signal has address 5.

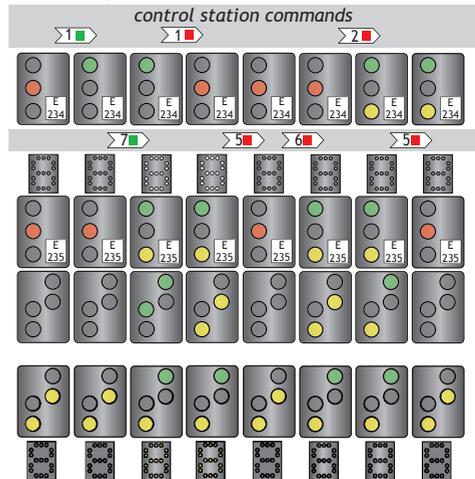
First connect the signals to the decoder one after another:



Next program the configuration variables according to the following table. The values given in grey do not need programming but they are written automatically when programming the values written on while background.

	signal	address	mode
function outputs	A0	A ₃₅	CV1=3 CV550=TODO
	A1	-	CV552 CV553
	A2	-	CV555 CV556
	A3	-	CV558 CV559
A4		A ₃₀	CV561=5 CV562=206
A5	E 235	A ₃₅	CV564=3 CV565=19
A6		-	CV567 CV568
A7		-	CV570 CV571
A8		A ₃₀	CV573=5 CV574=206
A9	E 234	A ₃₄	CV576=1 CV577=TODO
A10		-	CV579 CV580
A11		-	CV582 CV583
A12		-	CV585 CV586
A13	E 234	A ₂₄	CV588=1 CV589=19
A14		-	CV591 CV592
A15		-	CV594 CV595

Now you can switch signal aspects by sending control commands ("1" means pressing the green switching key on the control station after choosing accessory address 1):



5.20.2. SHUNTING SIGNALS

Finnish shunting signals are dwarf signals. There is an older type that has similar

aspects to the Swedish and Norwegian dwarf shunting signal ones. A newer version uses red bulbs for the stop aspect and slightly changed other aspects:

aspect	signal	
	new	old
shunting forbidden: stop		
shunting allowed	-	
shunting allowed: drive carefully		
shunting with local permission allowed		

CONTROLLING SHUNTING SIGNALS

The accessory address of the signal A_{signal} is written to the address configuration variable relating to the first function output the signal is connected to. Two addresses (A_{signal} and $A_{\text{signal}} + 1$) are used for switching of the signal aspects of shunting signals.

mode	82	87
function outputs	1	
	2	
	3	
control commands		
A_{signal}	stop	
A_{signal}	drive carefully	shunting allowed
$A_{\text{signal}} + 1$	local permission	
$A_{\text{signal}} + 1$	-	drive carefully

5.20.3. CONTROLLING SIGNALS BY INPUT KEYS

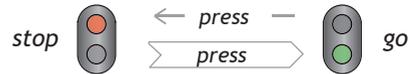
Any signal - including add-on signals - can be controlled by an input key connected to a function output of the Qdecoder using a 220 Ω resistor. Use one of the modes 226 or 227 for the function output for reading key input. Mode 227 is used when connecting a LED in parallel to the key. The LED might be used as signalling LED on the control desk

for example. (See chapter „An Example“ in the handbook for details.)

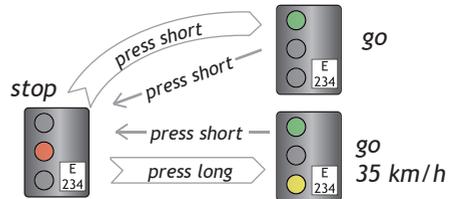
function	mode	
	without	with
The key controls ...	LED	
... the signal connected to the anterior function keys of the decoder using the signal switching flow	226	227

Once configured the key controls signal aspects depending on the signal aspect count.

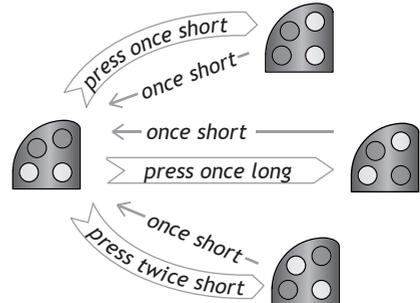
All signals with two aspects switch to the other aspect with a single key pressing.



On signals with three aspects there is a distinction between pressing the key for a short and a long time (about 1/2 second).



Old dwarf signals are an example for a signal with 4 different signal aspects. The are controlled by a key as follows:



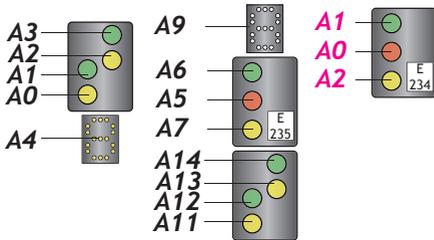
OUR EXAMPLE

Our example from page 129 needs a change when inserting keys for aspect control. We need one key for signal "234"

Signal ✓
 Ampel ×
 Licht ×

Basis × base class
 Standard × standard class
 Alleskönner × all-in-one class

and another for signal "235". The add-on signal "8" needs another key. Unfortunately the signals themselves use all 16 function outputs of our decoder. We need another decoder and split the functions between the two decoders. Function outputs of the second decoder are written in purple:



- A8: key for signal „235“
- A10: key for add-on signal „8“
- A15: key for signal „234“
- A3: connect to the same key for signal „234“ like A15

Sharing keys between two decoders is allowed on condition that

- The (blue) "+" terminals of the decoders are connected to each other directly.
- The Trafo connectors of the decoders are supplied by the same power supply.

Next program the configuration variables according to the following table. The values given in grey do not need programming but they are written automatically when programming the values written on white background.

	signal	address	mode
function outputs	A0	A ₇₃₄ CV1=3	CV550=TODO
	A1	- CV552	CV553
	A2	- CV555	CV556
	A3	- CV558	CV559
	A4	A ₈₀	CV561=5 CV562=206
	A5	A ₇₃₅ CV564=3	CV565=19
	A6	- CV567	CV568
	A7	- CV570	CV571
	A8	key „235“	- CV573
A9	A ₈₀	CV576=5	CV577=206

	signal	address	mode	
function outputs	A10	key „8“	- CV579	CV580=226
	A11	A ₇₃₄ CV582=1	CV583=TODO	
	A12	- CV585	CV586	
	A13	- CV588	CV589	
	A14	- CV591	CV582	
	A15	key „234“	- CV594	CV595=226

The second decoder needs configurations for the first four outputs:

	signal	address	mode
function outputs	A0	A ₇₃₄ CV1=1	CV550=19
	A1	- CV552	CV553
	A2	- CV555	CV556
	A3	key „234“	- CV558
...	use for others		

The same signal aspect sequence can now be attained by pressing the keys:

