LISSY Receiver 68 610

The new LISSY receiver 68 610 as a successor to LISSY receiver 68 600 offers some additional functions: locomotive specific hold time in automatic operation for shuttle traffic, holding point and block section, activation of locomotive special functions at various times in the switching sequence, and operation of a passing loop for special characteristics in the station controller.

The following section has a description of the new functions. Technical data, installation and programming correspond to the description of the LISSY receiver of 68 600 in the LISSY Manual Chapters 4-6.

1. New extended functions in automatic shuttle traffic, holding point and block section

In the 68 600 switching of special functions in automatic operation could only be done as the last operation. Only one holding delay was available for all trains. The order so far was:

Sequence	Function	When yes, then
1	Are solenoids, routs or feedbacks to be sent as in LNCV 80-109?	execute
2	Is a hold time programmed in LNCV 5?	wait
3	Are individual speed changes specified in LNCV 50-79?	execute
4	Are locomotive special functions specified in LNCV 20-49?	execute

This sequence was executed once, if the train arrived at the sensor and again, when the train at the signal drove off, because the block's exit signal indicated "green".

Here step 2 in the sequence was only executed if the block exit signal was switched from "red" to "green" and the train was to move off. They were not executed if the train found a "green" block exit signal upon its arrival at the sensor. This switching sequence was comprehensively extended with 68 610 and gives individual locomotive stop timing as follows:

Sequence	Function	When yes, then
1	Are locomotive special functions specified in LNCV 20-49?	Execute
2	Are solenoids, routs or feedbacks to be sent as in LNCV 80-109?	Execute
3	Are locomotive special functions specified in LNCV 20-49?	Execute
4	Is a hold time programmed in LNCV 5?	Execute
5	Are locomotive special functions specified in LNCV 20-49?	Execute
6	Is a locomotive specific hold time set in LNCV 110-127?	Wait
7	Are locomotive special functions specified in LNCV 20-49?	Execute
8	Are individual speed changes specified in LNCV 50-79?	Execute
9	Are locomotive special functions specified in LNCV 20-49?	Execute

Here steps 4 to 7 in the sequence are only executed if the block exit signal is switched from "red" to "green", the train then starts. They are not executed if the train found a "green" block exit signal upon arrival at the sensor.

1.1 Locomotive specific hold time

Till now the length of time the train was to wait after the block exit signal turns “green” was determined by LNCV 5. In the 68 610, in addition to this hold time, you can now program a locomotive specific hold time so that e.g. a rail motor stops at the platform longer than a goods train. Programming is done with the following LNCVs:

LNCV	Description
110-117	Locomotive addresses that will trigger the Holding time
120-127	Holding time in seconds (0-255)

The locomotive addresses are programmed using the same conventions that are also used for all other automation functions (see LISSY Manual Ch. 8.3.3 to 8.3.5).

The locomotive specific holding time is only available in the time controlled shuttle traffic, externally controlled shuttle traffic, holding point and block section modes.

1.2 Switching processes of locomotive special functions in different parts of the automatic sequence

As seen in the above sequence list for the automatic operation there are now 5 positions at which a locomotive's special function can be activated.

In the option for the switching of special functions, you can specify when the programmed switching function, in the switching succession, is to be implemented. It applies:

Computation of the command option for the changing locomotive special functions				
Option No,	**Description**	**Selection**	**Value**	**Total**
1	Ignore travel direction		0	
	Travel direction from S1 to S2		2	
	Travel direction from S2 to S1		3	
2	Switch operation 2 or 3		0	
	Automatic function 4-10, 20-26: upon arrival at sensor		0	
	Automatic function 4-10, 20-26: on departure		4	
3	Switch off special function		0	
	Switch on special function		8	
	Toggle special function		16	
4	Timer Toggle special function		32	
5	Switching duration in seconds (max 31 sec) * 256			
6	Position in the sequence (0-4) * 8192			
			Calculated value for LNCV 40 to 49	

With this extension it is now possible, in the automatic operation, to switch several special functions when a locomotive drives off in a block section.

Example: A railmotor with address 15 operating in block mode is firstly to play the sound of the closing doors (f3) and sound the horn (f2) as it starts moving. In this example the special function for the door sound must be set as step 2 and the horn sound at step 4. Both items must be programmed into different LNCVs. Additionally, a pause of 5 seconds must be placed between the two sounds using a locomotive specific hold time. The programming is:

Activate special function f3 at step 2 for 1 second:

Computation of the command option for the changing locomotive special functions				
Option No,	**Description**	**Selection**	**Value**	**Total**
1	Ignore travel direction		0	
	Travel direction from S1 to S2	X	2	2
	Travel direction from S2 to S1		3	
2	Switch operation 2 or 3		0	
	Automatic function 4-10, 20-26: upon arrival at sensor		0	
	Automatic function 4-10, 20-26: on departure	X	4	4
3	Switch off special function		0	
	Switch on special function	X	8	8
	Toggle special function		16	
4	Timer Toggle special function	X	32	32
5	Switching duration in seconds (max 31 sec) * 256	1s		256
6	Position in the sequence (0-4) * 8192	2		16384
			Calculated value for LNCV 40 to 49	**16686**

For activating special function 2 at position 4 for 1 second:

Programming of function instructions											
Command	**LNCV**	**... 0**	**... 1**	**...,2**	**... 3**	**... 4**	**... 5**	**... 6**	**... 7**	**... 8**	**... 9**
Address	**2...**	15	15								
Value	**3…**	8	4								
Option	**4…**	16686	33070								

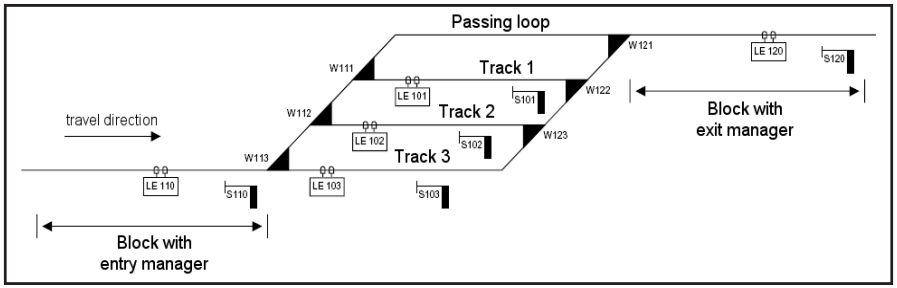
Programming of hold time											
Command	**LNCV**	**... 0**	**... 1**	**...,2**	**... 3**	**... 4**	**... 5**	**... 6**	**... 7**	**... 8**	**... 9**
Address	**11...**	15									
Value	**12…**	5									

2. Station control with passing loop

The station control mode in the LISSY receiver 68 610 has been expanded to include a passing loop. This track serves to provide a bypass of the station using a track especially intended for that purpose. The track does not require monitoring by a LISSY receiver. All trains which run on this track use it to arrive directly at the station exit (block with exit manager) without an intermediate stop at the station entry (block with entry manager).

The passing loop can be used for two different purposes:

1. When a particular solenoid is switched to “green” all trains arriving at the entry manager block are routed via the passing loop directly to the exit manager block. In this instance the entry manager behaves like a block section that is immediately before the exit manager. The system now assumes that, if the block exit signal is on "green", the route via the passing loop is also switched.
2. If the solenoid is switched to "red" all trains which are entered in LNCVs 122-127, drive via the passing loop.



2.1 Entry manager

The passing loop is established from the Entry manager, using LNCVs 13, 120 and 122-127 with following meaning:

- The solenoid address which selects the passing loop for all trains (set this solenoid to “green”) or only particular trains (set this solenoid to “red”)
- LISSY receiver address with which the Entry manager reports the passing loop as either occupied or vacant. *Note: This address must not be used by another LISSY receiver.*
- The addresses of the trains that are to use the passing loop. A specific address or train category can be used. Up to 6 different entries are possible.

LNCV	Description	Value range
2	Automatic operation as Entry manager	8 or 24
13	Meaning of LNCV if LNCV 2 is set to 8 or 24: Passing loop via solenoid control Solenoid green = All trains use the Passing loop Solenoid rot = only the train addresses or category entered in LNCV 122 to 127 use the passing loop	1-2000

LNCV	Description	Value range
120	Address with which the Entry manager reports the passing loop as either occupied or vacant. *This address (LNCV 0) cannot be used by any other LISSY receiver*	1-4095
121	Is not used	-
122-127	Addresses (1-9999) or train categories (20000-20004) of the locomotive that will automatically use the passing loop.	

Operation: The Entry manager reports the passing loop as “occupied” as soon as a train that is intended for the loop arrives. If the solenoid with the address in LNCV 13 is set to “green” (all trains bypass the station) the Entry manager reports the passing loop as “vacant” until this solenoid is switched to “red”. If the LISSY receiver is programmed as Entry manager and has a passing loop programmed in LNCV 120 then a similarly programmed time dependant stop in LNCV 10 is ignored and the block is always reported "free" whenever the block exit signal (LNCV 6) is switched from "green" to "red".

2.2 Exit manager

The passing loop is established from the Exit manager using LNCVs 13, 120 and 122-127 with following meaning:

- The address of the Entry manager of the station
- LISSY receiver address with which the Entry manager reports the passing loop as occupied or vacant (LNCV 120 of the Entry manager). *Note: This address must not be used by any other LISSY receiver*
- The command to switch a route in the Intellibox and in the IB-Switch. This route must contain all the switch operations required to clear the track, from the entry manager block to the Exit manager block. The last command must always be to switch the station entry signal to “green”.
- If the station bypass is activated and the desired trains arrive at the exit manager sensor, then to maintain safe block traffic the entry manager block exit signal must be set to "red" and this block’s entry signal to "green". These two switching operations are not those implemented by LNCVs 7 and 8 for tracks 1-10 in the station system. Upon arrival of a train which used the passing loop the switching operation from LNCV 7 and 8 are replaced by those in LNCV 122 and 123.

LNCV	Description	Value range
13	Meaning of the LNCV if LNCV 2 has a value of 9,10, 25 or 26: Linking of the operation of the Exit and Entry mangers. 0 = no linking of Exit and Entry manger 1-4095 = if this is the address from LNCV 0 of the matching Entry manager the Exit manager detects if a locomotive is waiting for entry to the station. The Exit manager vacates a track so the train can enter the station. The prerequisite is that LNCVs 20-119 are programmed identically in both managers. Furthermore a new train is automatically selected if a station with passing loops mode is switched from "all trains use the passing loop" back to "normal operation".	1-4095
120	Address with which the entry manager reports the passing loop as occupied or vacant. *This address (LNCV 0) must not used by any other LISSY receiver*	1-4095
121	Route from station entry to exit Command to switch the route from the Intellibox or IB-Switch leads from the entry manager block to the exit manager block.	0-20483
122	If a train arrives via the passing loop, then in these instruction replace those in LNCV 7 (Programming see LNCV 7)	0-20483
123	If a train arrives via the passing loop, then in these instruction replace those in LNCV 8 (Programming see LNCV 8)	0-20483

Operation: In the Exit manager’s view the passing loop is a station track with two special characteristics:

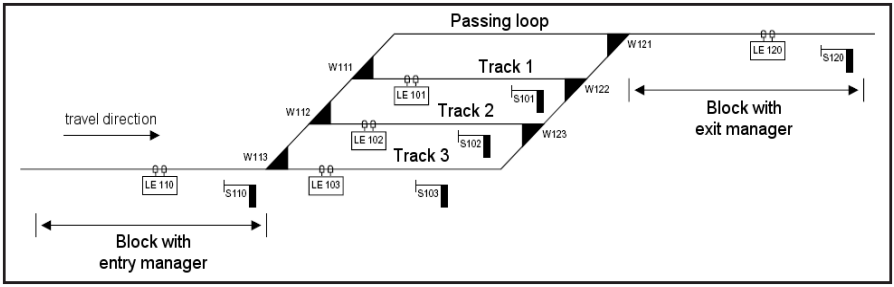
1. If this track is occupied it takes priority over all other tracks to free and switch its route as set by LNCV 121.
2. If this track was vacated arriving trains in LNCVs 7 and 8 are replaced by LNCVs 122 and 123.

If the Entry manager is switched by solenoid command to direct all trains via the passing loop it reports the passing loop as vacant. The Exit manager now directs all trains through the passing loop. That means as soon as the Exit manager's block is vacant, its entry signal is switched to "green" and any arriving train can immediately drive through the passing loop to the Exit manager's block.

If the Exit manager permits such train travel and has switched the route via the passing loop, the Exit manager then waits for the arrival of a train. In this state, if the Entry manager is switched back to the state to permit trains into the station by solenoid command (as set in its LNCV 13) the Entry manager spontaneously reports the passing loop vacant again. So that no unintended train collisions occur, the Exit manager waits until such time a train arrives at the Entry manager. After that, the Exit manager selects a new train and switches a new route out of the station. This new selection can be only accomplished if the Exit manager's LNCV 13 is programmed with the special address of its associated Entry manager.

Example 1: Station control with 3 station tracks and a passing loop

The automatically operated station consists of three station tracks and a passing loop. The station tracks 1 to 3 are to be used by all trains, except for trains of train category 4 and the locomotive with address 200. Trains of category 4 and locomotive 200 bypass the station via the passing loop. The solenoid address 100 is to be used to allow all trains to use the passing loop. The entire station control is switched off with solenoid address 130.



Default setting of LNCVs 0-15 of the five LISSY receivers

LE	LNCV / Function	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
110	**Entry manager**	110	0	8	0	0	2	110	0	0	0	0	130	0	100	0	9
101	**Block section**	101	0	23	0	0	2	101	1100	0	0	0	130	0	0	0	9
102	**Block section**	102	0	23	0	0	2	102	1100	0	0	0	130	0	0	0	9
103	**Block section**	103	0	23	0	0	2	103	1100	0	0	0	130	0	0	0	9
120	**Exit Manager**	120	0	9	0	0	2	120	20201	0	0	0	131	0	100	0	9

Programming of LISSY receiver LE 110 (Entry manager)

	LNCV	... 0	... 1	... 2	... 3	... 4	... 5	... 6	... 7	... 8	... 9
Track 1	**2...**	101	20170	20000	0	0	0	0	0	0	0
Track 2	**3...**	102	20171	20000	0	0	0	0	0	0	0
Track 3	**4...**	103	20180	20000	0	0	0	0	0	0	0
Passing loop	**12...**	100	0	20004	0	0	0	0	0	0	0

Programming of LISSY receiver LE 120 (Exit manager)

	LNCV	... 0	... 1	... 2	... 3	... 4	... 5	... 6	... 7	... 8	... 9
Track 1	**2...**	101	20181	20000	0	0	0	0	0	0	0
Track 2	**3...**	102	20190	20000	0	0	0	0	0	0	0
Track 3	**4...**	103	20191	20000	0	0	0	0	0	0	0
Passing loop	**12...**	100	20200	1100	0	0	0	0	0	0	0

Program the Routes in the Intellibox

Route Group and number	3/1	3/2	3/3	3/4	3/5	3/6	3/7	3/8
Route function	**Entry Track 1**	**Entry Track 2**	**Entry Track 3**	**Exit Track 1**	**Exit Track 2**	**Exit Track 3**	**Passing loop**	**Station sig. red**
Solenoid	20170	20171	20180	20181	20190	20191	20200	20201
Step 0	113 R	113 R	113 G	122 R	123 R	123 G	113 R	101 R
Step 1	112 G	112 R	110 G	121 R	122 G	122 G	112 G	102 R
Step 2	111 R	110 G		101 G	121 R	121 R	111 G	103 R
Step 3	110 G				102 G	103 G	121 G	
Step 4							110 G	

The example refers to the programming of the 5 LISSY receivers from the combination pack “Shadow station control” with part number 68 020.

The above example is implemented with the following routes programmed into an IB-Switch.

Default setting of LNCVs 0-15 of the five LISSY receivers

LE	LNCV / Function	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
110	**Entry manager**	110	0	8	0	0	2	110	0	0	0	0	130	0	100	0	9
101	**Block section**	101	0	23	0	0	2	101	1100	0	0	0	130	0	0	0	9
102	**Block section**	102	0	23	0	0	2	102	1100	0	0	0	130	0	0	0	9
103	**Block section**	103	0	23	0	0	2	103	1100	0	0	0	130	0	0	0	9
120	**Exit Manager**	120	0	9	0	0	2	120	83	0	0	0	130	0	100	0	9

Programming of LISSY receiver LE 110 (Entry manager)

	LNCV	... 0	... 1	... 2	... 3	... 4	... 5	... 6	... 7	... 8	... 9
Track 1	**2...**	101	13	20000	0	0	0	0	0	0	0
Track 2	**3…**	102	23	20000	0	0	0	0	0	0	0
Track 3	**4…**	103	33	20000	0	0	0	0	0	0	0
Passing loop	**12…**	100	0	20004	200	0	0	0	0	0	0

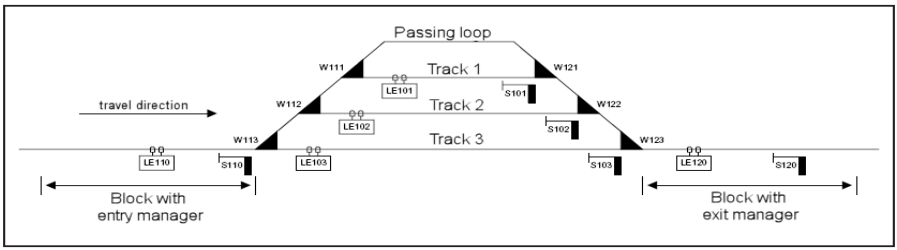
Programming of LISSY receiver LE 120 (Exit manager)

	LNCV	... 0	... 1	... 2	... 3	... 4	... 5	... 6	... 7	... 8	... 9
Track 1	**2...**	101	43	20000	0	0	0	0	0	0	0
Track 2	**3…**	102	53	20000	0	0	0	0	0	0	0
Track 3	**4…**	103	63	20000	0	0	0	0	0	0	0
Passing loop	**12…**	100	73	1100	0	0	0	0	0	0	0

Program the Routes in the IB-Switch

Route Group and number	1	2	3	4	5	6	7	8
Route function	**Entry Track 1**	**Entry Track 2**	**Entry Track 3**	**Exit Track 1**	**Exit Track 2**	**Exit Track 3**	**Passing loop**	**Station sig. red**
Route set for feedback	1 set	2 set	3 set	4 set	5 set	6 set	7 set	8 set
Step 1	113 R	113 R	113 G	122 R	123 R	123 G	113 R	101 R
Step 2	112 G	112 R	110 G	121 R	122 G	122 G	112 G	102 R
Step 3	111 R	110 G		101 G	121 R	121 R	111 G	103 R
Step 4	110 G				102 G	103 G	121 G	
Step 5							110 G	

Example 2: Same example with a different track plan



Default setting of LNCVs 0-15 of the five LISSY receivers

LE	LNCV / Function	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
110	**Entry manager**	110	0	8	0	0	2	110	0	0	0	0	130	0	100	0	9
101	**Block section**	101	0	23	0	0	2	101	1100	0	0	0	130	0	0	0	9
102	**Block section**	102	0	23	0	0	2	102	1100	0	0	0	130	0	0	0	9
103	**Block section**	103	0	23	0	0	2	103	1100	0	0	0	130	0	0	0	9
120	**Exit Manager**	120	0	9	0	0	2	120	20121	0	0	0	130	0	100	0	9

Programming of LISSY receiver LE 110 (Entry manager)

	LNCV	... 0	... 1	... 2	... 3	... 4	... 5	... 6	... 7	... 8	... 9
Track 1	**2...**	101	20090	20000	0	0	0	0	0	0	0
Track 2	**3...**	102	20091	20000	0	0	0	0	0	0	0
Track 3	**4...**	103	20100	20000	0	0	0	0	0	0	0
Passing loop	**12...**	100	0	20004	200	0	0	0	0	0	0

Programming of LISSY receiver LE 120 (Exit manager)

	LNCV	... 0	... 1	... 2	... 3	... 4	... 5	... 6	... 7	... 8	... 9
Track 1	**2...**	101	20101	20000	0	0	0	0	0	0	0
Track 2	**3...**	102	20110	20000	0	0	0	0	0	0	0
Track 3	**4...**	103	20111	20000	0	0	0	0	0	0	0
Passing loop	**12...**	100	20120	1100	0	0	0	0	0	0	0

Program the Routes in the Intellibox

Route Group and number	**3/1**	**3/2**	**3/3**	**3/4**	**3/5**	**3/6**	**3/7**	**3/8**
Route function	**Entry Track 1**	**Entry Track 2**	**Entry Track 3**	**Exit Track 1**	**Exit Track 2**	**Exit Track 3**	**Passing loop**	**Station sig. red**
Solenoid	20090	20091	20100	20101	20110	20111	20120	20121
Step 0	113 R	113 R	113 G	121 R	122 R	123 G	113 R	101 R
Step 1	112 G	112 R	110 G	122 G	123 R	103 G	112 G	102 R
Step 2	111 R	110 G		123 R	102 G		111 G	103 R
Step 3	110 G			101 G			121 G	
Step 4							122 G	
Step 5							123 R	
Step 6							110 G	

The above example is implemented the following routes in an IB-Switch.

Default setting of LNCVs 0-15 of the five LISSY receivers

LE	LNCV / Function	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
110	Entry manager	110	0	8	0	0	2	110	0	0	0	0	130	0	100	0	9
101	Block section	101	0	23	0	0	2	101	1100	0	0	0	130	0	0	0	9
102	Block section	102	0	23	0	0	2	102	1100	0	0	0	130	0	0	0	9
103	Block section	103	0	23	0	0	2	103	1100	0	0	0	130	0	0	0	9
120	Exit Manager	120	0	9	0	0	2	120	20201	0	0	0	130	0	100	0	9

Programming of LISSY receiver LE 110 (Entry manager)

	LNCV	... 0	... 1	... 2	... 3	... 4	... 5	... 6	... 7	... 8	... 9
Track 1	2...	101	13	20000	0	0	0	0	0	0	0
Track 2	3...	102	23	20000	0	0	0	0	0	0	0
Track 3	4...	103	33	20000	0	0	0	0	0	0	0
Passing loop	12...	100	0	20004	200	0	0	0	0	0	0

Programming of LISSY receiver LE 120 (Exit manager)

	LNCV	... 0	... 1	... 2	... 3	... 4	... 5	... 6	... 7	... 8	... 9
Track 1	2...	101	43	20000	0	0	0	0	0	0	0
Track 2	3...	102	53	20000	0	0	0	0	0	0	0
Track 3	4...	103	63	20000	0	0	0	0	0	0	0
Passing loop	12...	100	73	1100	0	0	0	0	0	0	0

Program the Routes in the IB-Switch

Route Group and number	1	2	3	4	5	6	7	8
Route function	Entry Track 1	Entry Track 2	Entry Track 3	Exit Track 1	Exit Track 2	Exit Track 3	Passing loop	Station sig. red
Route set for feedback	1 set	2 set	3 set	4 set	5 set	6 set	7 set	8 set
Step 1	113 R	113 R	113 G	121 R	122 R	123 G	113 R	101 R
Step 2	112 G	112 R	110 G	122 G	123 R	103 G	112 G	102 R
Step 3	111 R	110 G		123 R	102 G		111 G	103 R
Step 4	110 G			101 G			121 G	
Step 5							122 G	
Step 6							123 R	
Step 7							110 G	

Guarantee declaration

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.

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