EN Safety Instructions

Please read this technical manual through completely before beginning installation.

Non-professional installation can endanger the operational safety of your vehicle.

Make sure the RTK-QS is safely connected to vehicle ground!

Note that a sound level of > 90 dB (A) is achieved even during test operation!

Contents

Definition of terms

Alley Light	Side lamp for close-range illumination
Airhorn	Signal similar to a horn
AS	Work lamp
BSX	Directed auxiliary strobe-type headlamp
Coding	Combination of tonal sequences and interlocking for the adaptation of country-specific specifications
eAZD	Electronic alarm pull and turn switch for controlling eight functions
Vehicle wiring	Wiring within the vehicle
Unit wiring	Wiring within the RTK-QS
Grill	Signal similar to a telephone
HDK	Horn pushbutton
HiLo	US two-tone tonal sequence
HKL	Main rotating beacon

KL-LED	LED Rotating beacon with groove parabolic reflector
KL	Rotating beacon
KL–ER	Rotating beacon with one reflector
KL–MR	Rotating beacon with multiple-reflector system
KL XL2	Strobe-type beacon with lens system
KL XR2	Strobe-type beacon with groove parabolic reflector
KLF	Tonal sequence
LA module	Central control unit for the radiation of acoustic signals and the operation of four light sources
L module	Extension module for LA module for the operation of six additional light sources
LSP-F	Loudspeaker, front
LSP-H	Loudspeaker, rear
NF module	Auxiliary module for the transmission of voice messages, radio or recorder on the LSP
NKL	Auxiliary beacon
UDS	Accident date recorder
Wail	US tonal sequence, standard
Yelp	US tonal sequence, cross-signal

General information

System description

The Hella RTK-QS is an innovative modular development especially designed for medium-sized and large special vehicles such as fire engines, rescue service vehicles etc. One of its outstanding features is its choice of lengths which range from 1100 mm for commercial vehicles in "van" size up to 2200 mm. Matching the length of the unit to the size of your vehicle will always guarantee an optimum warning effect, even at close range.

The modular structure allows you to put together your own RTK-QS tailor-made to your own particular requirements, from a basic version right through to the maximum-feature version. There are four beacon systems and a range of different work lamps for close-range illumination at the incident site to choose from. Even the control possibilities can be adapted to your specific requirements. The system can be operated either using conventional key buttons or via an "electronic alarm pull and turn switch" available as an accessory. When the NF module from the accessories range is used, voice messages, radio override and recorder messages are possible in optimum quality, making your instructions clear and easy to hear and understand by all those involved in the operation.

The light/acoustic module as the central control unit allows the operation of four light modules and the radiation of different tonal sequences. The electronics stand out thanks to the programmable micro-processor which makes it possible to adapt the central control electronics to the various national and international requirements at any time. The numerous code versions available thus result in a suitable variant for every application. If you need additional light sources, the electronics can be extended by a light module with a further six connection possibilities. All RTK-QS modules meet the most stringent electromagnetic compatibility requirements.

If you should find at any time that additional functions would be sensible, these can be retrofitted quickly and without the need for special tools thanks to the well thought-out system structure.

Another eye-catching feature is the attractive low-profile design, which can reduce the clearance height required at the site of an incident by a few vital centimetres in comparison with traditional rotating beacons.

General information

Functions

○ When the NF module is used in addition

- Two or four rotating beacons as optical warning signals.
- As an alternative, high-performance strobe-type beacons in lens or groove parabolic versions
- Electronic generation and radiation of different warning signals and voice messages through two pressure chamber loudspeakers
- Work lamps for illumination of the incident site
- Processor-controlled central control electronics with automatic recording of the module configuration as well as extensive system function control with error memory and display
- Two Alley lights for illuminating at close range at the side of the vehicle

○ Voice messages through the two front and one additional (optional) rear loudspeaker

○ Voice messages with hand-held operating unit FuG 7/8 or Teledux 9 or separate microphone

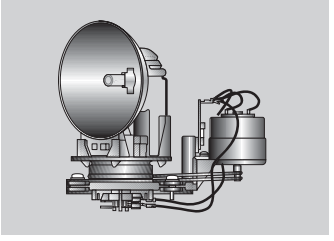
○ Radiation of incoming radio messages

Additional connection possibilities

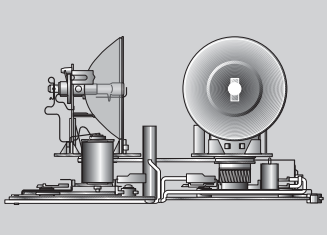
CAUTION!
If the auxiliary rotating beacons are switched off, this can lead to the all-round effect of the vehicle being lost

- Additional external strobe-type beacons (for close-up effect) e.g. BSX–N
- External main or auxiliary rotating beacons including triggering and control
- Control through the eAZD
- Tachometer and/or accident data recorder
- NF module for the transmission of voice messages, radio override or radio/recorder signals
- Control of external compressed air signalling system e.g. Martin's horn
- Horn pushbutton for one-off tonal sequence

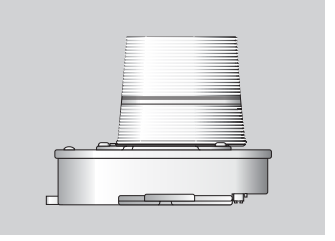
Modules



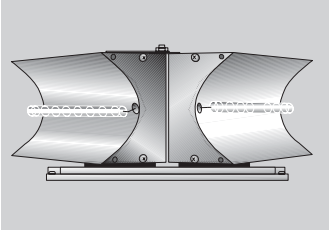
Variant 1
KL–ER (2 units)
Rotating beacon with H1-bulb and single reflector incl. rotating speed control



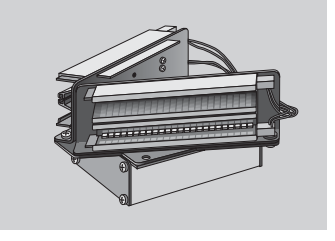
Variant 2
KL–MR (2 units)
Rotating beacon – multiple-reflector system with H1-bulb and DC-motor incl. rotating speed control



Variant 3
KL-XL2 (2 units)
Strobe-type beacon with lens system and standard flash tube X1

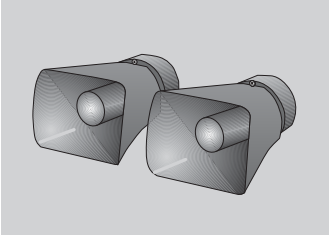


Variant 4
KL-XR2 (2 units)
Strobe-type beacon with exchangeable groove parabolic reflector

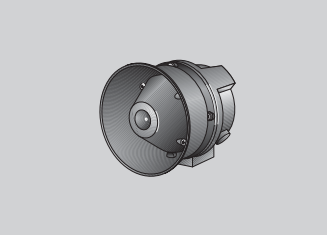


Variant 5
KL-LED (2 units)
LED Rotating beacon with groove parabolic reflector

Modules

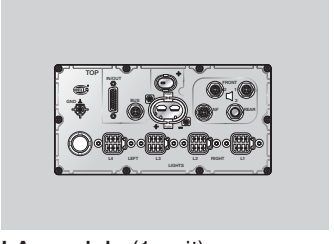


LSP-F (2 units)
Pressure chamber loudspeaker
Front (2 x 22W)

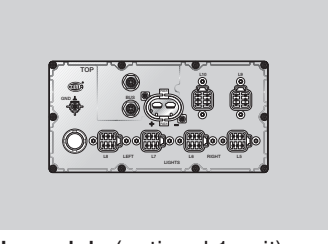


LSP-H (optional, 1 unit)
Pressure chamber loudspeaker
Rear 22W

Alley Light (optional 2 units)
Work lamp for close-range illumination alongside the vehicle



LA-module (1 unit)
Light/acoustic module for the control of four light modules and the generation of different tonal sequences



L-module (optional 1 unit)
Light module for the control of an additional six light modules

Scope of supply Basic system RTK-QS

Basic system RTK-QS 1100 mm - 2200 mm

General Installation-references

Caution:
Disconnect the vehicle battery before beginning installation work.

Make sure that the RTK-QS is connected to the vehicle chassis (ground) at low impedance via the fixing screws or the ground connection.
This is necessary for reasons of EMC and in particular for the integrated strobe-type system (KL-XL2, KL-XR2) as protection from dangerous contact voltages in the event of an insulation fault.

Before beginning installation work, clarify with the vehicle manufacturer whether or not roof reinforcement is necessary!

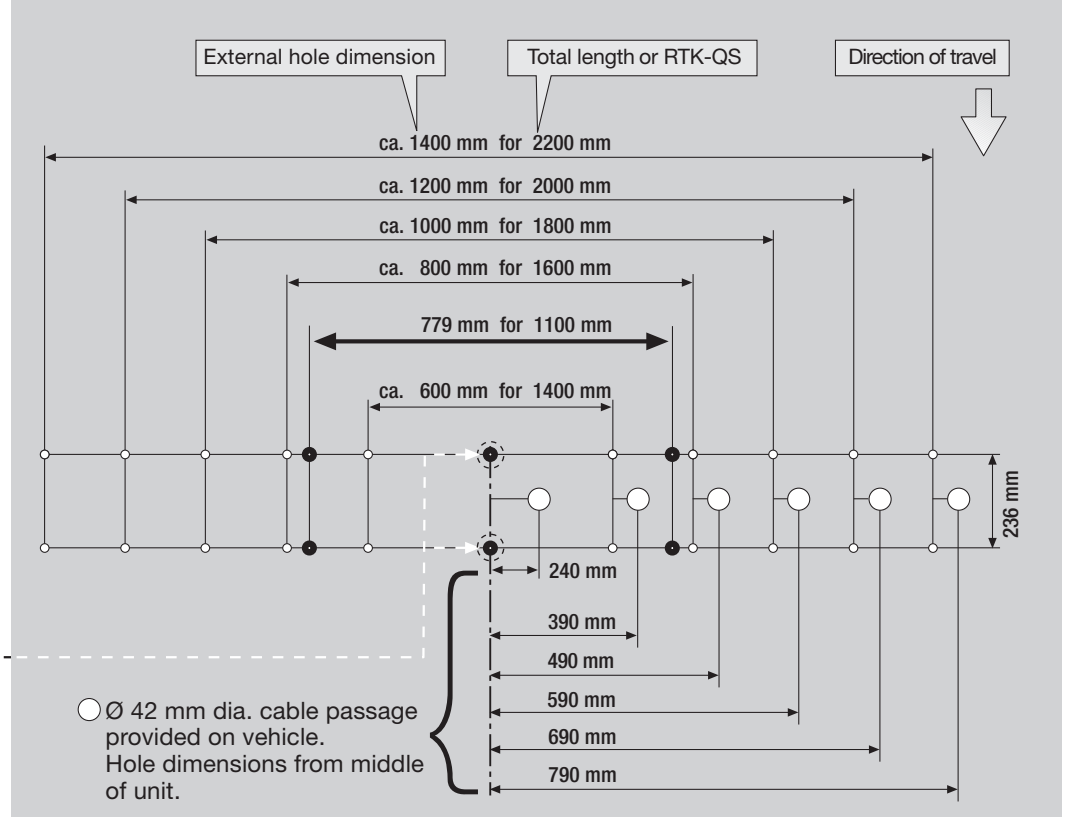
Installation

Hole pattern for RTK-QS for all length versions

For total length up to 1600 mm use 2x2 attachment screws, up to 1800 mm use 4x2 attachment screws

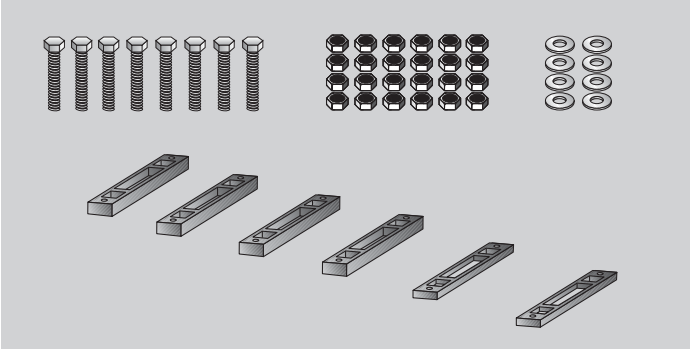
Seal all drilled metal parts with rust protection paint.

Two central drill-holes are additionally essential when mounting an 1100 mm system with mounting kit 863 122-00.



Accessory-Mounting kit 863 122-00

- Bases
- Fastening screws
- Holder system for seal

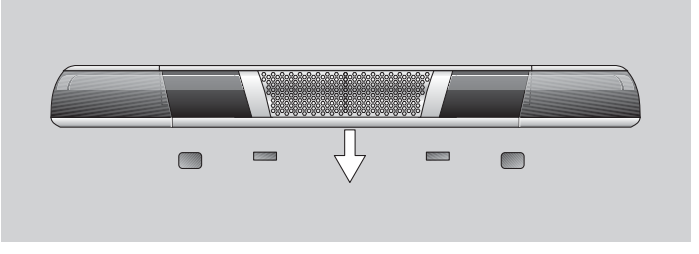


Mounting RTK-QS 1400-2200 mm

with accessory kit 863 122-00

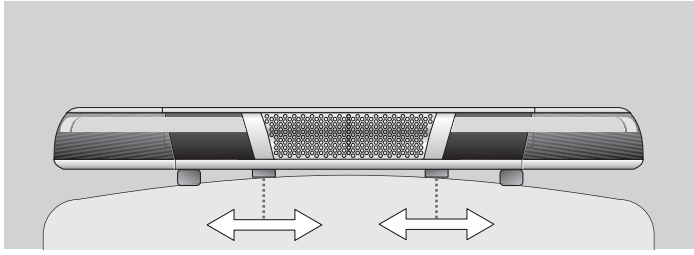
The vehicle roof support area must be freed of dirt and humidity before installation.

Mark the outline of the RTK-QS on the vehicle roof.



Put fixing bases in place (for dimensions see the drilling diagram on page 55).

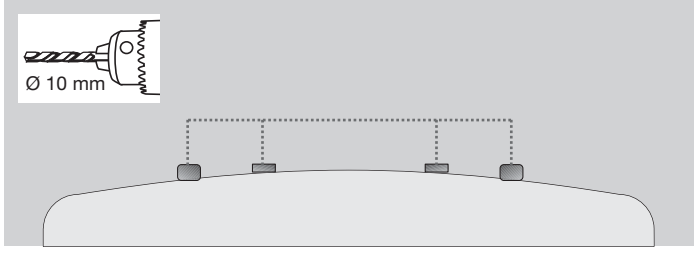
Place the required number of fixing bases on the roof in such a way that they can be mounted with the upper edge of all the fixing bases as vertical as possible and with the bases as near as possible to the outer edges of the supporting frame.



Align the central fixing bases depending on the slope of the roof.

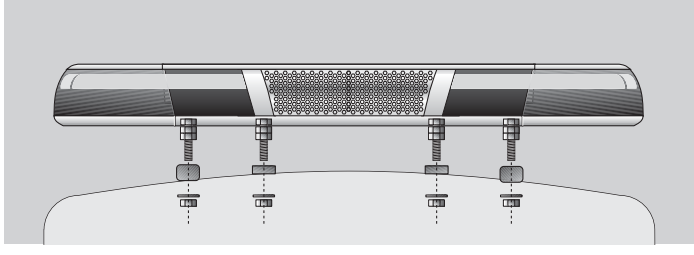
In the case of a flat roof, mount 4 fixing bases of the same height.

Drill the holes Ø 10 mm at the respective spots according to the dimension drawing.



Mark the distances between the holes and drill them.

Note the distances between the holes of the bases. Insert screws into the RTK-QS rails and tighten these to match the distance between the fixing bases using the nuts and lock-nuts included.



Insert the screws into the rails, align according to drilling dimensions, tighten (7 - 10 Nm) and add compensation nuts depending on the slope of the roof.

Mounting RTK-QS 1100 mm

with accessory kit 863 122-00

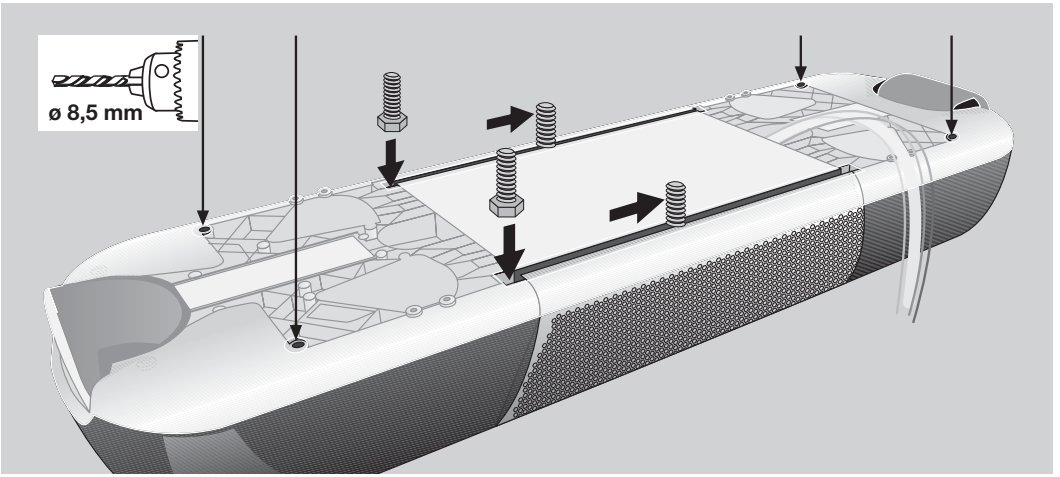
In contrast to the versions with greater overall length (see page 54-57), the 1100 mm version is additionally screwed on both sides, underneath the dome.

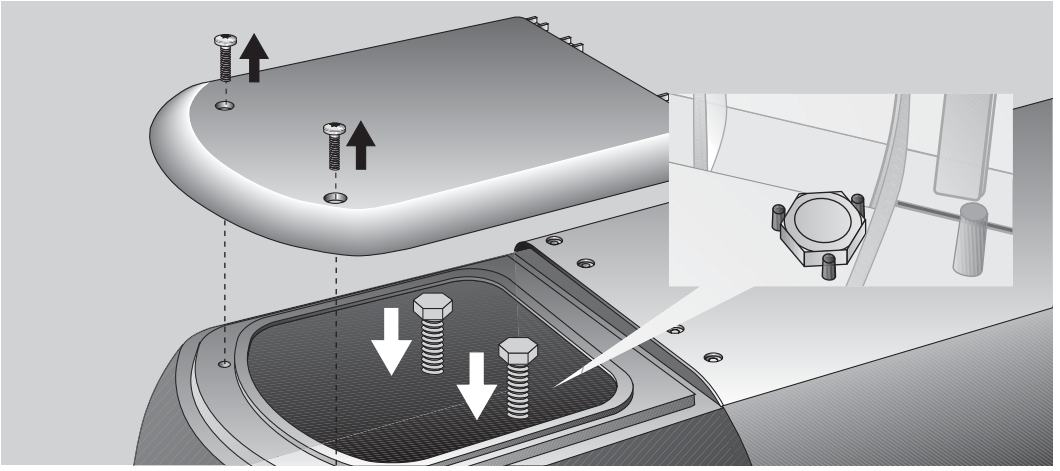
Lay the roof bar on the cover – protect against scratches.

Opening of the film below the dome, using an Ø 8.5 mm diameter drill-bit.

Insertion of 2 fastening screws in the grooves of the basic carrier.

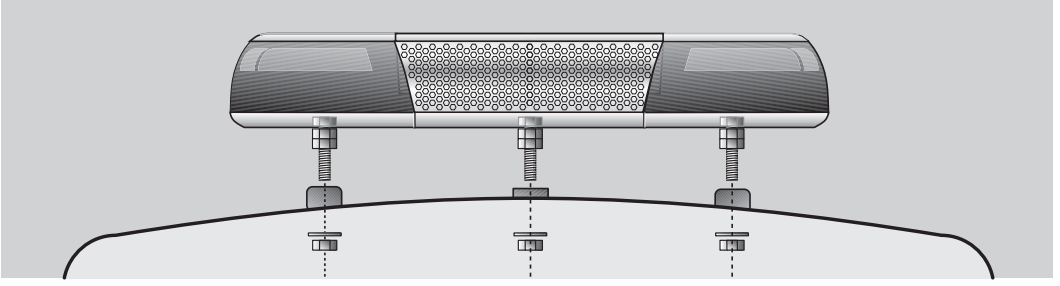
Remove the dome cover. Put 4 M8 hexagon bolts from above through the base.





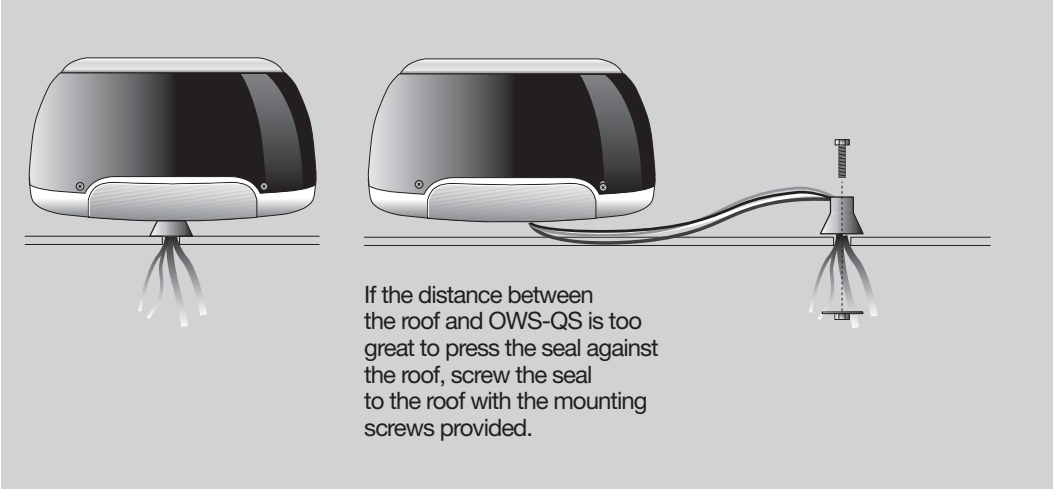
Putting the roof bar onto the roof. When doing so, put the screws and cables into the intended drill-holes.

Tightening of the screws to a torque of 5-7 Nm.



Cable passage

Drill Ø 42 mm dia. cable passage at proper position. Route cable through cable opening and install grommet in cable opening.
Tighten RTK-QS uniformly with nuts (7-10 Nm with screw retention).
Then check whether the OWS-QS is horizontal and mounted free of tension.
The level can be corrected by tightening the mounting nuts differently.



If the distance between the roof and OWS-QS is too great to press the seal against the roof, screw the seal to the roof with the mounting screws provided.

Accessories
Rubber bases

The rubber base 864 285-00 has been specially developed for mounting the RTK- and OWS-QS onto a flat roof-attachment.

The rubber bases 864 286-00/01/02 have been specially developed for mounting the RTK- and OWS-QS to arched roofs.

If roof bars with Alley Lights are fitted, the necessary recess can be made with a simple cut.

1100 mm flat roof
Set 864 285-00

Base flat 2x
864 284-00

1100 mm arched roof
Set 864 286-00

Base arched 2x
864 282-00

Centre piece 200 mm 2x
864 283-00

1400 mm arched roof
Set 864 286-01

Base arched 2x
864 282-00

Centre piece 300 mm 1x
864 281-00

Centre piece 200 mm 2x
864 283-00

1600 mm arched roof
Set 864 286-02

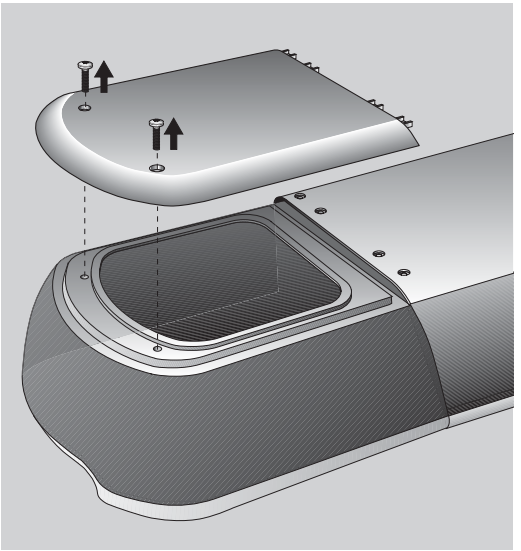
Base arched 2x
864 282-00

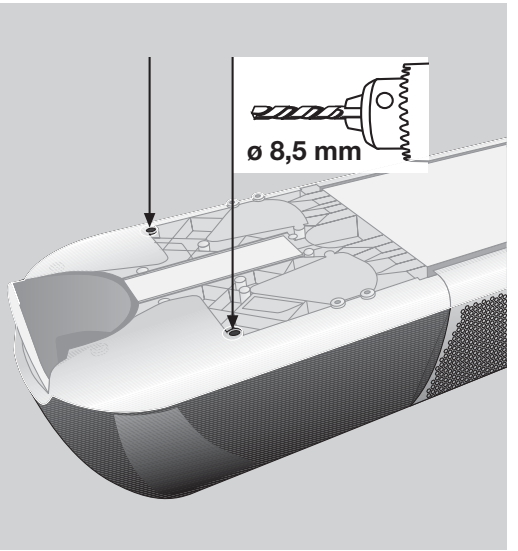
Centre piece 300 mm 3x
864 281-00

Mounting with rubber base

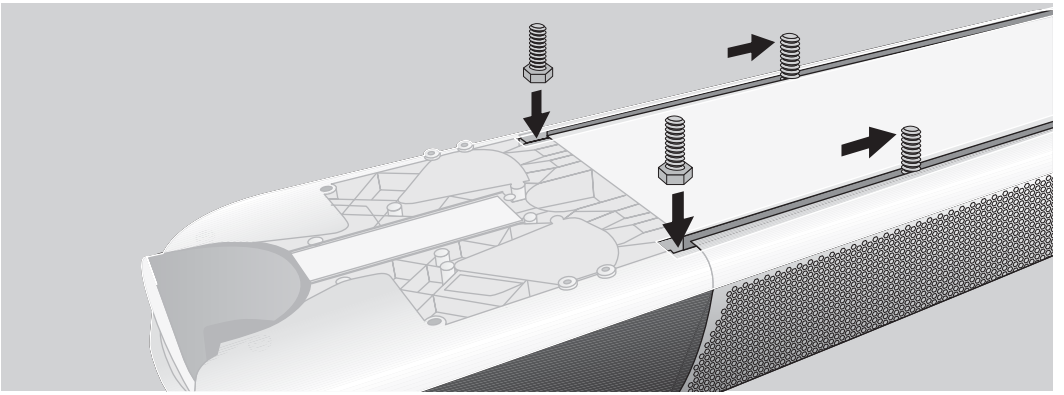
Drilling holes in accordance with the drilling diagram (see page 55) in the vehicle roof. When doing so, observe the screw holes in the base.

Only in the case of 1100 mm overall length
Remove the covers of the domes.
Opening of the film below the dome 4x with an Ø 8.5 mm diameter drill-bit.



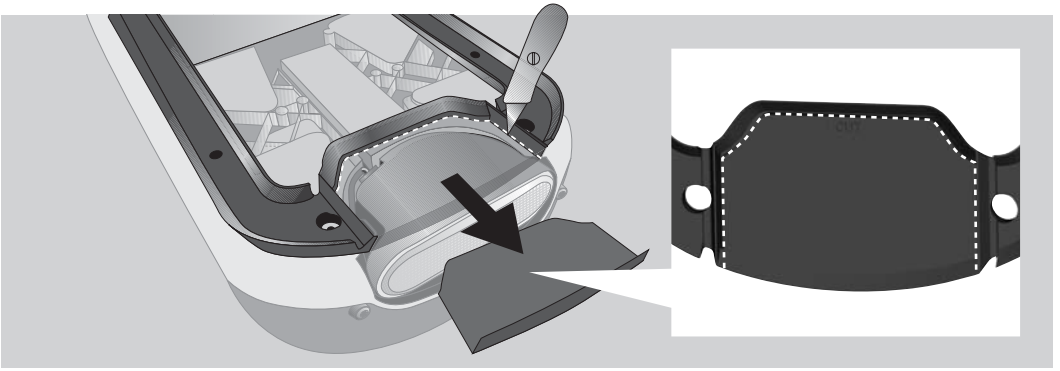


Lay the roof bar on the cover! Protect against scratches! Depending on the length of the unit, insert 4-8 fastening screws in the grooves of the basic carrier.

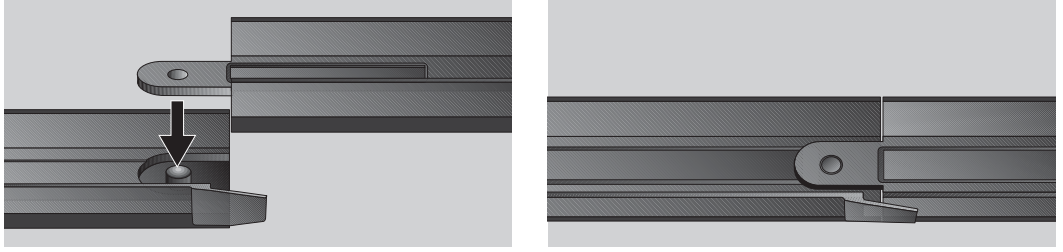


Alley Light

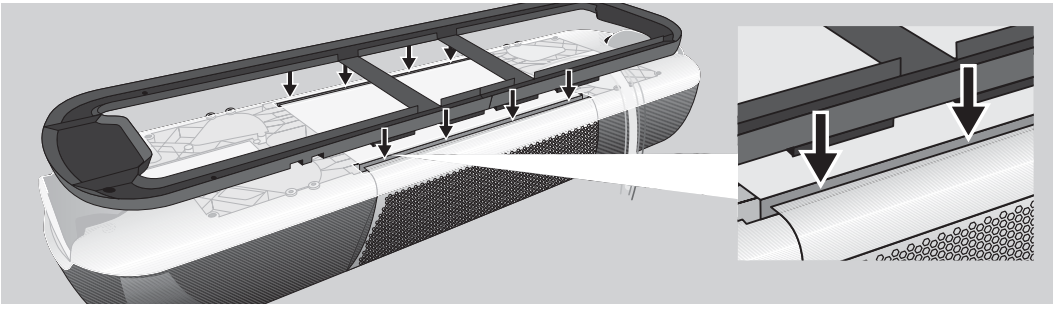
In the case of roof bars with Alley Llight, a knife is used to make a recess in the rubber base along the specified cutting line.



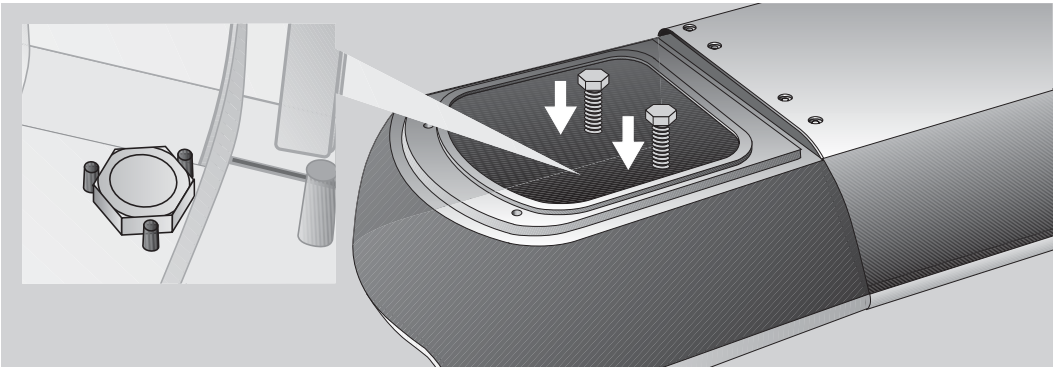
Lay the base on the intended points of the roof bar and link together.



Push the base into the groove at the marked points.



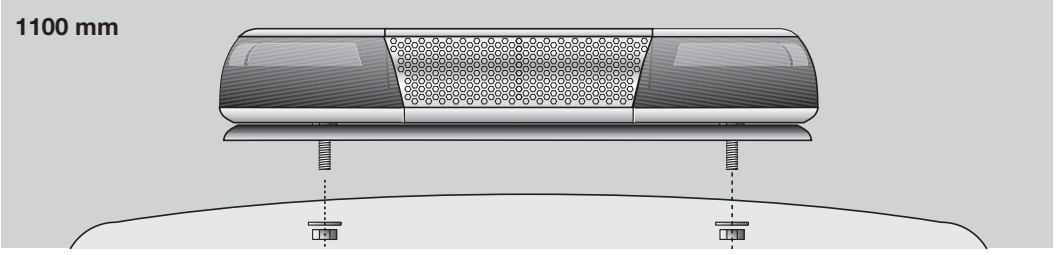
Only in the case of 1100 mm overall length
Put 4x M8 hexagon bolts from above through the base.



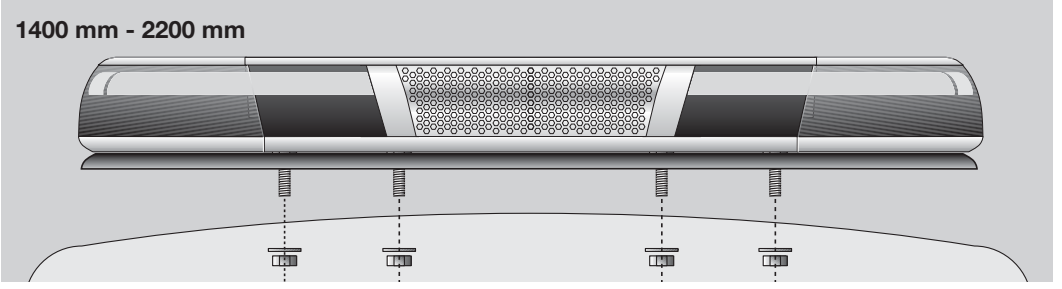
Putting the roof bar onto the roof. When doing so, put the screws and the cables into the intended drill-holes.

Tightening of the screws to a torque of 5-7 Nm.

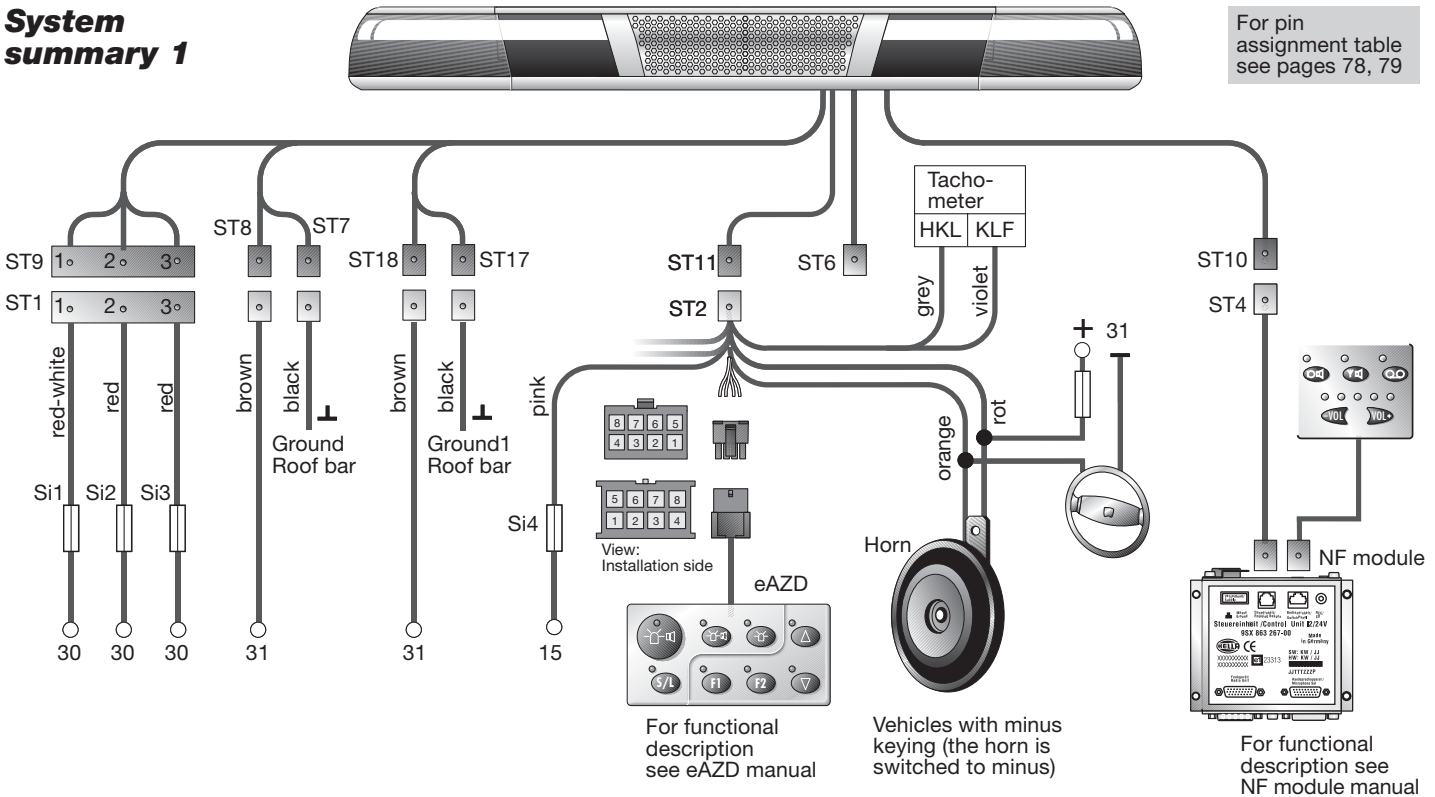
1100 mm



1400 mm - 2200 mm

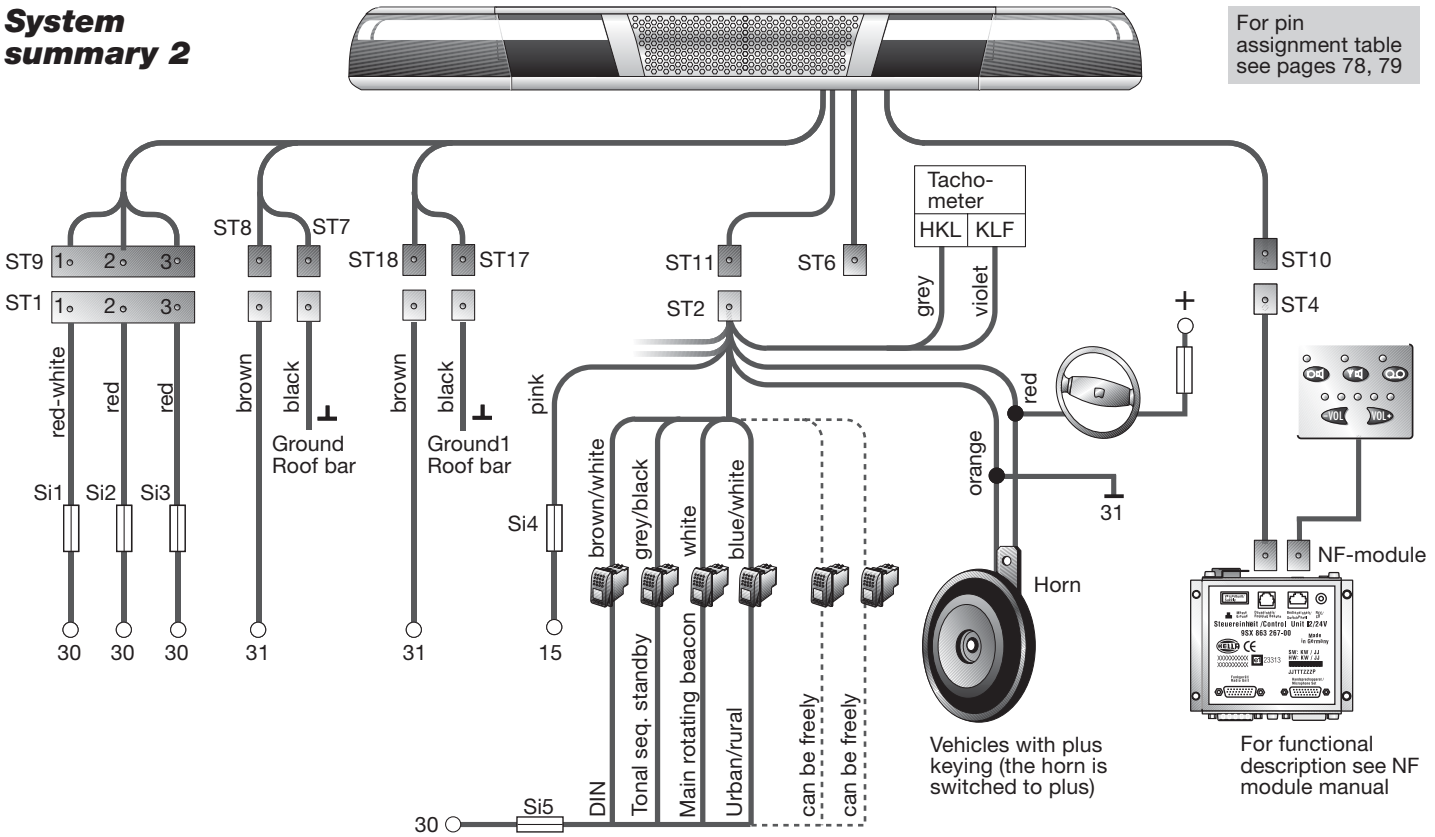


System summary 1



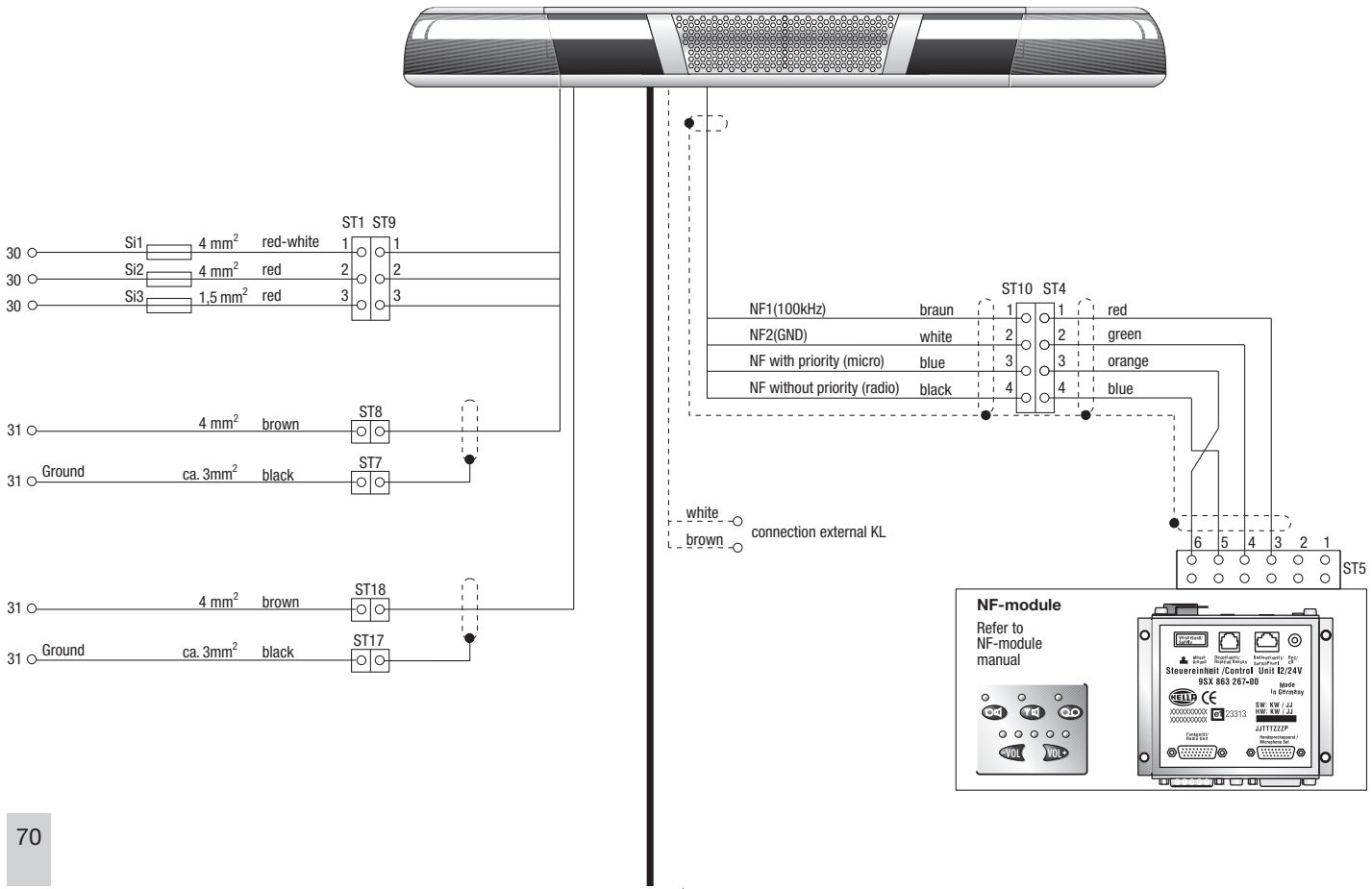
For pin
assignment table
see pages 78, 79

System summary 2

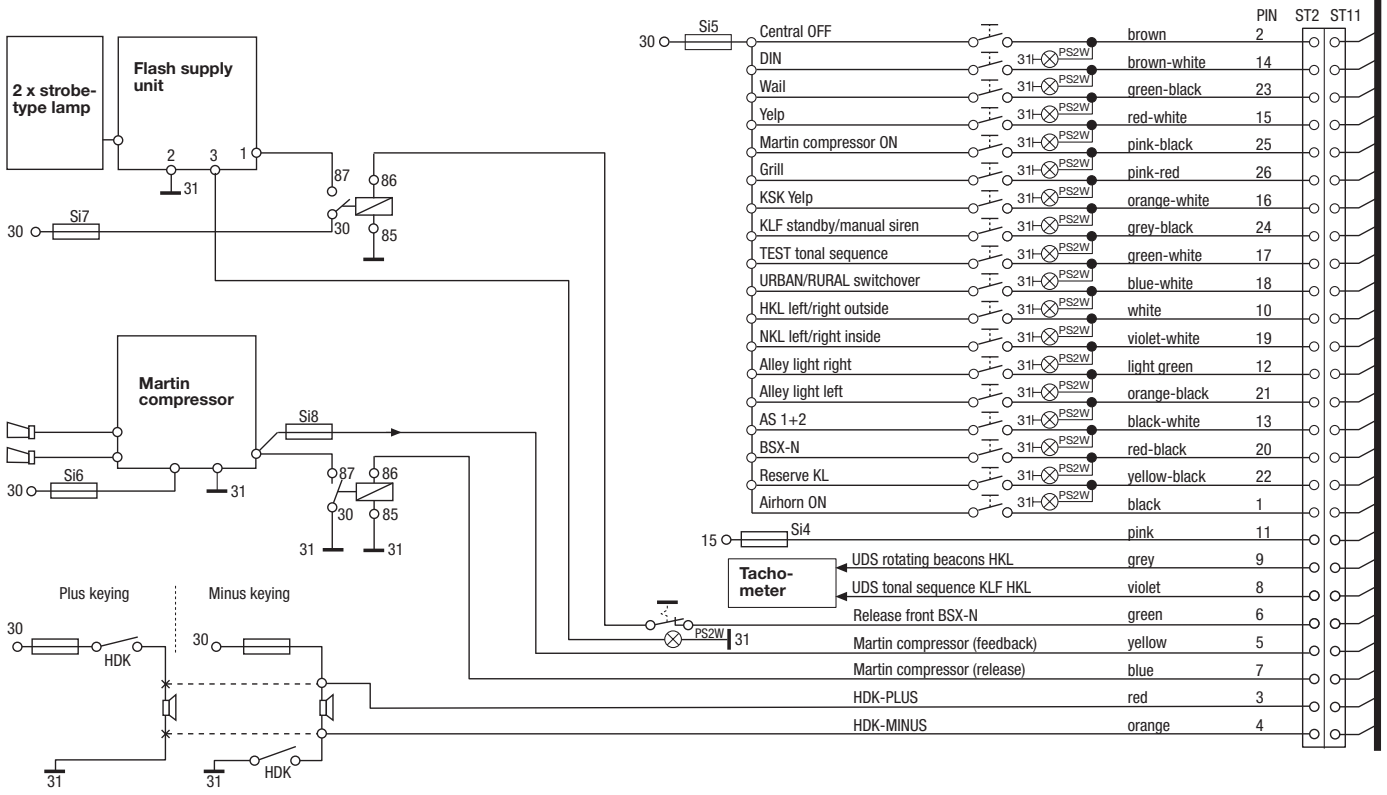


For pin assignment table see pages 78, 79

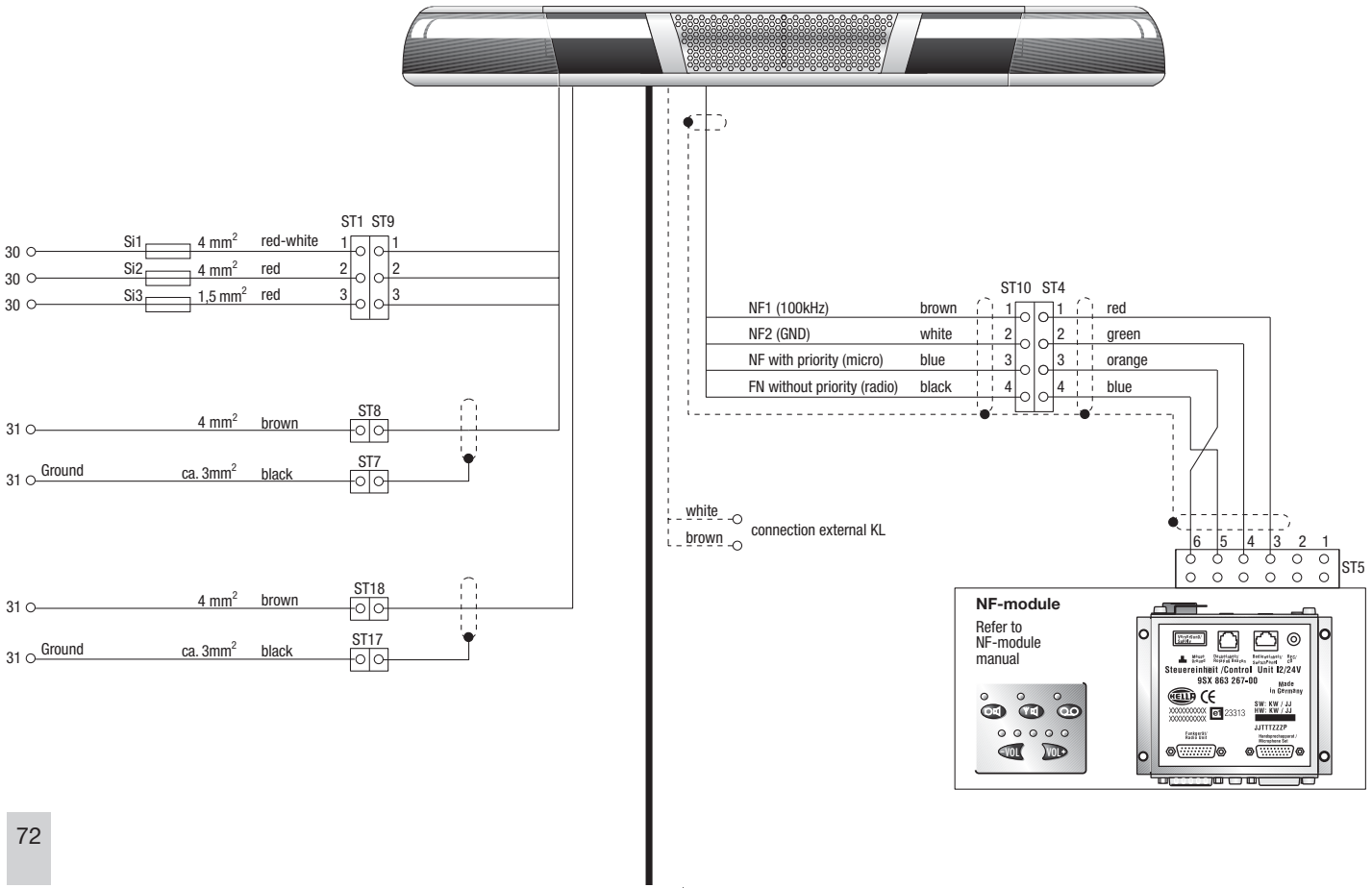
Circuit diagram 1



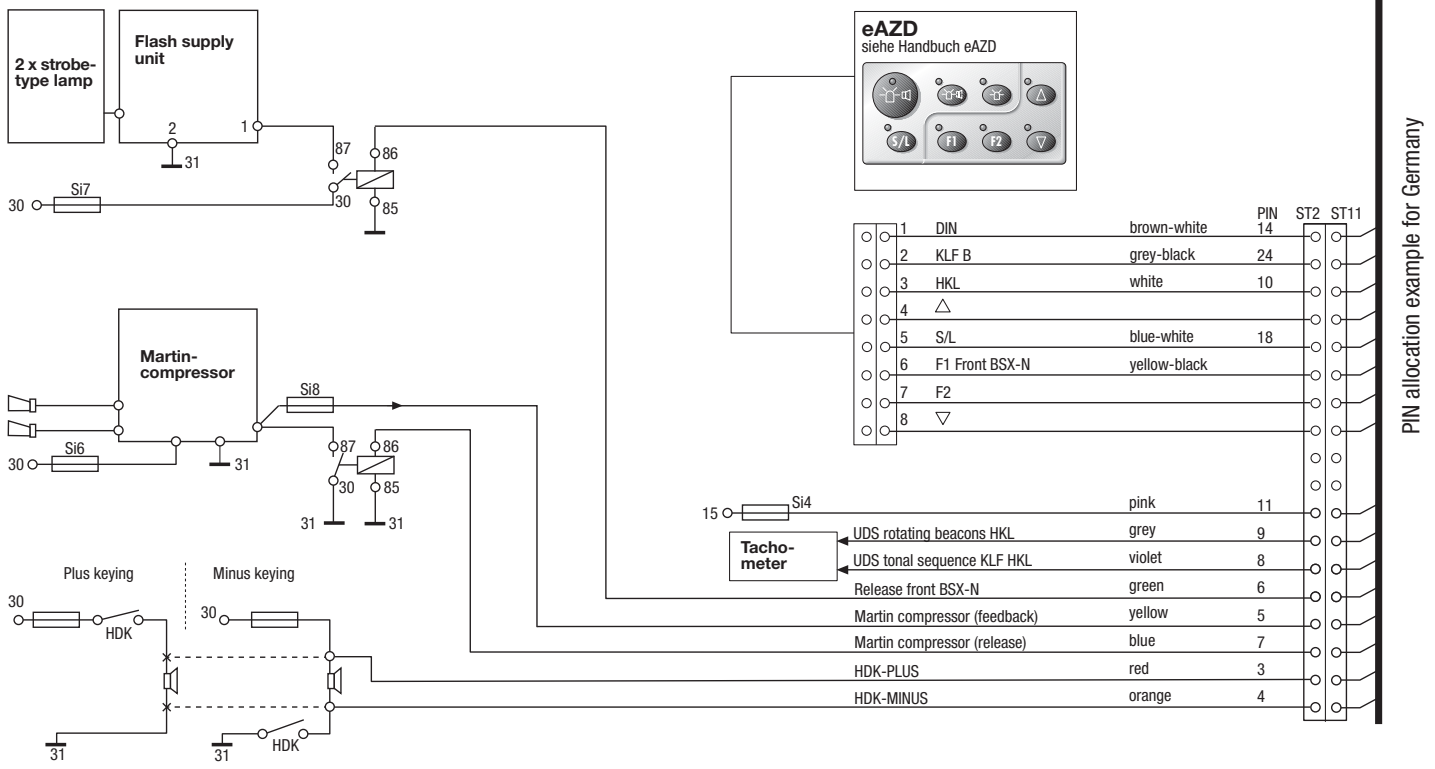
Circuit diagram 1



Circuit diagram 2



Circuit diagram 2



PIN allocation example for Germany

General cabling information

- The connection cables have to be ordered separately depending on the version required (see Accessories).
- The line resistance of the current supply to the light current circuit from the battery (plus) to the supply plug of the LA and L modules has to be ≤ 20 mΩ.
- The line resistance of the current supply to the amplifier circuit from the battery (plus) to the supply plug of the LA and L modules has to be ≤ 50 mΩ.Ω
- If the minus wire (31) of the LA and/or L modules (brown, 4mm^2) is extended by the customer, the cross-section of the extension wire must be ≥ 6 mm^2.
  The line resistance must be ≤ 10 mΩ.
- The ground wire must be placed over the vehicle structure in as short a path as possible.
  The wire is without current and serves as a ground connection for the metal corpus of the RTK-QS. It may be extended by 0.25 m maximum.
  A common connection with the switching minus of the LA and/or L modules is not permissible. The attachment points in the roof area have to be at least 50 mm apart.
- If the Hella vehicle wiring set is not used for the supply voltage of the LA and/or L modules, the necessary wire cross-section must be calculated depending on the length of the wire and max. current load, using the table as a guide.
- When connecting rotating beacons to the LA and/or L module and attachment of rotating beacons outside the RTK-QS, wire harnesses must be ordered accordingly (see Accessories).
  The wires must be threaded through the available vacant throughputs in the cable sleeve afterwards.

Wire resistances

1.5 mm²	=	approx.12 mΩ/m
2.5 mm²	=	approx. 7 mΩ/m
4.0 mm²	=	approx. 4.5mΩ/m
6.0 mm²	=	approx. 3 mΩ/m
10 mm²	=	approx. 1.2mΩ/m

Max. current load

1.5 mm²	=	≤≤ 15 A
2.5 mm²	=	≤≤ 25 A
4.0 mm²	=	≤≤ 40 A
6.0 mm²	=	≤≤ 60 A
10 mm²	=	≤≤ 100 A

Fuse table

The selection of the fuse Si1 and Si2 depends on the max. module configuration of the roof unit (see module table)

Fuse number	12 V system	24 V system
Si 1 Light L module	10 - 40 A (max)	10 - 30 A (max)
Si 2 Light LA module	10 - 30 A (max)	10 - 20 A (max)
Si 3 Amplifier LA module	10 A	7.5 A
Si 4 Terminal 15	1 A	1 A
Si 5 Button	1 A	1 A
Si 6 Martin compressor	see description in Martin manual	
Si 7 BSX-N	3 A	3 A
Si 8 Martin feedback3 A	3 A	

Module table

Max. current consumption per module for selection of Si1 and Si2

Beacon system	Lamp type	Current 12 V	Current 24 V
Strobe-type system KL-XL2	Flash	3.5 A	1.8 A
Rotating mirror KL-ER	H1	5.5 A	3 A
Xenon work lamp	Xenon (higher start-up current)	3.5 A	1.8 A
	H7	4.5 A	2.7 A
	H1/3	5.5 A	3 A
Alley-light	H7	4.5 A	2.7 A

Calculation example

with an LA module integrated in the roof bar and an L module

LA-module Si 2	1 x KL-ER	H1	5.5 A	3 A
	1 x Alley light	H7	4.5 A	2.7 A
	1 x ASW	Xenon*	3.5 A	1.8 A
Total:			**13.5 A**	**7.5 A**
Fuse size for Si 2 with Xenon for AS			**25 A**	**20 A**

LA-module Si 2	1 x KL-ER	H1	5.5 A	3 A
	1 x Alley light	H7	4.5 A	2.7 A
	1 x ASW	H1	5.5 A	3 A
Total:			**15.5 A**	**8.7 A**
Fuse size for Si 2 with H1 for AS			**20 A**	**15 A**

L -module Si 1	1 x KL-ER	H1	5.5 A	3 A
	1 x Alley light	H7	4.5 A	2.7 A
Total:			**10 A**	**5,7 A**
Fuse size for Si 1			**15 A**	**10 A**

*When Xenon light is used, the size of the fuse must be increased by 10 A on account of the increased start-up current.

LED trough module

Rated voltage	12V	24V
Operating voltage	10V ... 30V	
Average current for double flash		
blue	2.6 A	1.3 A
amber	1.6 A	0.8 A
Flashing frequency	2 Hz	
Light source	LED	
Quantity	2 x 2 reflectors with 24 LEDs each	
Flashing sequences ECE	single, double	
Flashing sequences other	triple, quad	
Flashing sequence SAE	single 1 Hz	
Operating temperature range	-40°C .... +60°C	
Function output	yes	
Synchronisation	yes	
Sectional operation	yes	
Day / night light level	no	
Self-diagnosis	available	
Photometric homologation:		
blue	TB1 MD E1 002466	
amber	TA1 MD E1 002466	
EMC	according to 72/245/EC in the version 2006/28/EC	

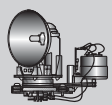
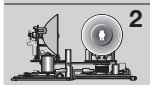
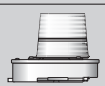
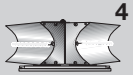
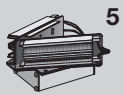
Unit variants

Due to the modular design of the RTK-QS and the multitude of possible combinations of different modules, not all the unit variants can be listed.

Code keys
(example)

Length	Unit lead	LA-module	Alley light left	AS1/ KL XL2	Light dome left	Lens left	LSP
(plain text)	863120-00 **0** 863120-01 **1** 863120-02 **2** 863120-03 **3** 863120-04 **4** 863120-05 **5** 863120-06 **6**	No **0** Yes **1**	No **0** Yes **1**	No **0** AS1 **1** KL XL2 **2**	Blue **0** Red **1**	Blue painted **0** Blue clear **1** Red painted **2** Red clear **3**	no **0** front **1** front and rear **2**

1600	12	2	2	1	0	1	1	0	0	0	0	2	2	2	1

Volt	Beacon	L-module	Alley light right	AS2/ KL XL2	Light dome right	Lens right	Lead for 3rd beacon
(plain text)	 **1**  **2**  **3**  **4**  **5**	No **0** Yes **1**	No **0** Yes **1**	No **0** Yes **1** KL XL2 **2**	Blue **0** Red **1**	Blue painted **0** Blue clear **1** Red painted **2** Red clear **3**	None **0** 3rd beacon **1** 4rd beacon **2** Both **3**

Vehicle wiring

The vehicle wiring serves to connect the RTK-QS inside the vehicle. The vehicle wiring set comprises all the supply and control wires you need for your individual RTK-QS version.

If your RTK-QS is equipped with lead no. 863 120-06 you do not require a vehicle wiring set.

Lead no.	Control	Supply LA-module	Supply L-module	NF-Modul
8KB 863 119 00	Individual wires	yes	no	no
8KB 863 119-01	Individual wires	yes	no	yes
8KB 863 119-02	Bus wires	yes	no	yes
8KB 863 119-03	Individual wires	yes	yes	no
8KB 863 119-04	Individual wires	yes	yes	yes
8KB 863 119-05	Bus wires	yes	yes	yes

Connection of external rotating beacons

If additional rotating beacons are required for an all-round warning effect in accordance with the specifications of the German STVZO regulations.

These beacons can be connected to the RTK-QS and controlled by it.
Cable no. 8KB 863 116-00 is required for the connection of these rotating beacons.

CAUTION!
If the auxiliary rotating beacons are switched off, this can lead to the all-round effect of the vehicle being lost

Accessories

Operation

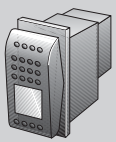
The electronic pull and turn switch especially designed for the RTK-QS or individual key buttons can be used for operation.

electronic pull and turn switch
9SX 008 902-00

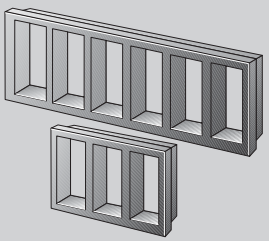
Individual key buttons

Caution! The RTK-QS has been designed for operation with key buttons. Switch operation is not possible!

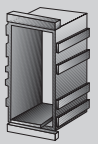
Max. 2W bulbs can be uses as control lamps.



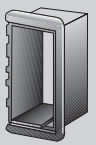
6RH 007 832



8HG 713 621 for 6 key buttons
8HG 714 504 for 3 key buttons



8HG 716 735

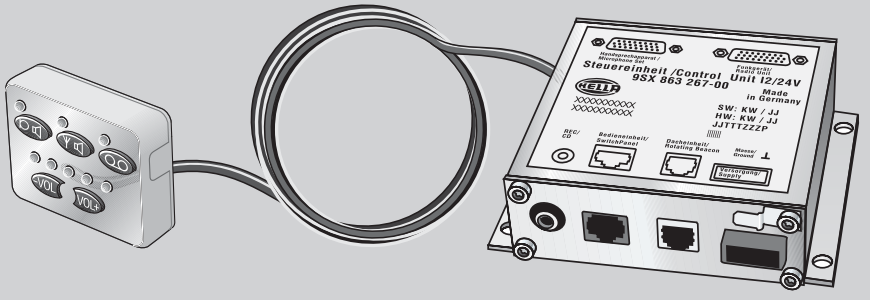


8HG 716 734

Voice messages

The NF-module **9SX 863 114-00** incl. operating panel is required for voice messages.

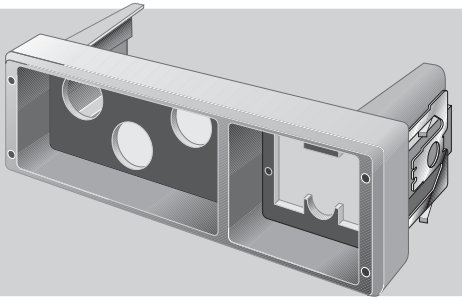
The NF switch unit represents an optional extension of the RTK-QS that processes and forwards low frequency signals from radio equipment, microphones and other low frequency units such as CD players and recorders.



For connection to the various radio equipment, the following cables are required:	Connection hand-held operating unit (HSA)
	Connection of radio (FuG 7/8)
	Connection of radio (FuG Teledux)
	Connection of rod microphone with potentiometer (MIC)

Installation frame

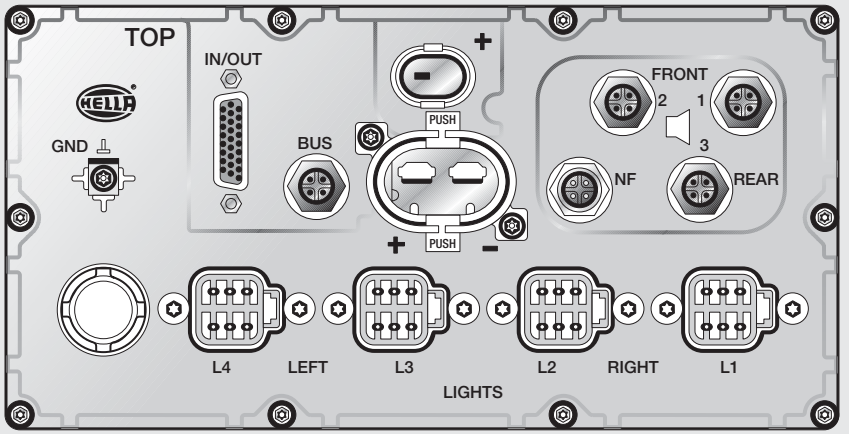
The installation frame **8HG 863 383-00** can be used to install the eAZD and NF module in the DIN radio recess.

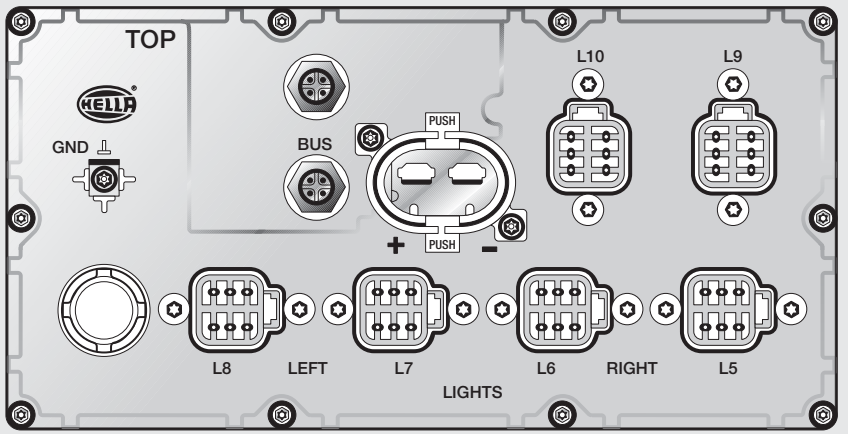


Board slot allocation

LA-module
5XA 008 877-XX

L-module
5XA 863 115-XX





Board slot allocation Case 1: LA-module is available

- If only one LA module is available, a distinction is made between LEFT and RIGHT for the connection of side-related lamps such as Alley lights.
- All the lamps related to the left-hand side of the roof bar in the direction of travel are connected to board slots L3 and L4 of the LA module.
- All the lamps related to the right-hand side of the roof bar in the direction of travel are connected to board slots L1 and L2 of the LA module.
- All the lamps not related to any particular side can be connected to any free board slots.

Board slot allocation Case 2: LA-module and L-module are available

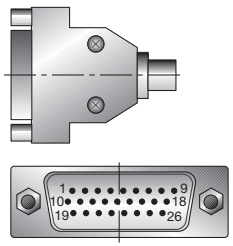
- When an LA and L-module are installed, the distinction between LEFT and RIGHT is no longer made.
- All the lamps related to the left-hand side of the roof bar are connected to board slots L1 - L4 of the LA-module in any order.
- All the lamps related to the right-hand side of the roof bar are connected to board slots L5 - L10 of the L-module in any order.
- All the lamps not related to any particular side can be connected to any free board slots.

Pin assignment table

RTK-QS: Interface
Unit/vehicle wiring set

Control pins

Pin 2 = 26-channel



View:
Solder connection side (26-channel jack)

CAUTION!
All the cable ends not used must be insulated!

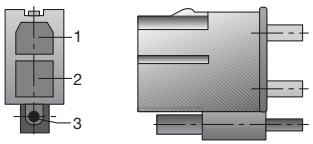
Pin no.	Colour	Cross-section	Name of signal	Function
1	bla	0.22mm^2	AIRHORN	Key button
2	br	0.22mm^2	Central OFF key button	Key button
3	rd	0.22mm^2	Horn pushbutton PLUS	Control input
4	or	0.22mm^2	Horn pushbutton MINUS	Control input
5	ye	0.22mm^2	Feedback MARTIN compressor	Control input
6	gn	0.22mm^2	Release front BSX and HWL	Data output
7	bl	0.22mm^2	Release MARTIN compressor	Data output
8	vio	0.22mm^2	UDS tonal sequence KLF	Data output
9	gr	0.22mm^2	UDS rotating beacons HKL	Data output
10	wh	0.22mm^2	HKL double left/right outside	Button+display
11	pi	0.22mm^2	Terminal 15	Control input
12	light gn	0.22mm^2	Alley Light right	Button+display
13	bla-wh	0.22mm^2	Work lamps 1+2	Button+display
14	br-wh	0.22mm^2	DIN	Button+display
15	rd-wh	0.22mm^2	YELP	Button+display
16	or-wh	0.22mm^2	Cross-signal YELP	Button+display
17	gn-wh	0.22mm^2	TEST tonal sequence	Button+display
18	bl-wh	0.22mm^2	URBAN/RURAL changeover	Button+display
19	vio-wh	0.22mm^2	NKL double left/right inside	Button+display
20	rd-bla	0.22mm^2	BSX-F	Button+display
21	or-bla	0.22mm^2	Alley light left	Button+display
22	ye-bla	0.22mm^2	Reserve light	Button+display
23	gn-bla	0.22mm^2	WAIL	Button+display
24	gr-bla	0.22mm^2	Manual siren / Tonal sequence standby	Button+display
25	pi-bla	0.22mm^2	MARTIN compressor ON	Button+display
26	pi-rd	0.22mm^2	GRILL	Button+display

NF-pin
Pin 4 = 4-channel

View:
Solder connection

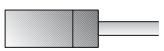
Pin no.	Colour	Cross-section	Name of signal
1	rd	0.14mm^2	NF-Bus 1 (100kHz)
2	gn	0.14mm^2	NF-Bus 2 (GND)
3	or	0.14mm^2	NF with priority (micro)
4	bl	0.14mm^2	NF without priority (radio)
Housing		Folienschirm mit Beilauflitze	Screen

Supply (+12/24V)
Pin 1 = 3-channel



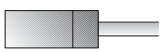
Pin no.	Colour	Cross-section	Name of signal
1	rd-wh	4mm^2	LOADPLUS light L module
2	rd	4mm^2	LOADPLUS light, L/A module
3	rd	1.5mm^2	LOADPLUS acoustic, L/A module

Supply (-12/24V)
Pin 8 = 1-channel



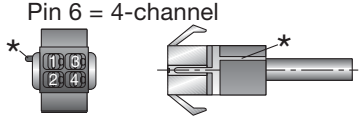
Pin no.	Colour	Cross-section	Name of signal
1	br	4mm^2	LOADMINUS, L/A module

Ground connection
Pin 7 = 1-channel



Pin no.	Colour	Cross-section	Name of signal
1	bla	Cu braiding approx.3mm^2	Ground (roof bar)

CAN-bus
Pin 6 = 4-channel



View:
Crimp connection side

*Marking
Pin 1

Pin no.	Colour	Cross-section	Name of signal
3	ye	0.38mm^2	CAN-HIGH
2	wh	0.38mm^2	CAN-LOW
1	br	0.38mm^2	Switch-on PLUS
4	gn	0.38mm^2	Reserve

Technical data

Optics and acoustics
StVZO, §52
ECE R65
DIN 14610
SAE1849

EMC guidelines
DIN VDE 0879-2
(IEC CISPR 25)
ISO 11452-2,3
Richtlinie TR 010
der Behörden und
Organisation mit Sicherheits-
aufgaben BOS
ISO 7637-1,2,3
ISO TR 10605

Type approval marks
B1 E1 001719 ER
B1 E1 001720 MR
B1 E1 001721 XL2
W25035
e1 023312

Interface operating unit/roof module		
Uni-directional NF-BUS: 5 V/100kHz		
Module equipment (UN)	12 V	24 V
Rotating beacon (2 units per system):	~5.5 A	~3.0 A
Strobe-type beacon (2 units per system):	~3.5 A	~1.8 A
KL-MR	~11 A	~6 A
Alley light	~4.5 A	~2.7 A
AS	~5.5 A	~3 A
AS-xenon	~3.5 A	~1.8 A
KL-LED	~3 A	~1,5 A
(The specifications all refer to the average current consumption of one module unit. The total current consumption is determined by adding together the current values according to the equipment level of the RTK-QS.)		
General:		
Protective rating (roof structure):	IP 5K 4K and/or IP X 9K(high-pressure cleaner), DIN 40050, sheet 9	
Operating temperature:	-40 °C-...+60 °C	
Storage temperature:	-40 °C-...+85 °C	
Dimensions:		
Length:	1400 mm / 1600 mm / 1800 mm / 2000 mm / 2200 mm	
Width:	300 mm	
Height (without Alley light):	155 mm	
Weight (min. version):	15 kg	
Weight (max. version):	depending on equipment	

Rated voltage (UN)	12 V	24 V
Operating voltage (UB):	10,8-15 V	21,6-30 V
Functional voltage range:	10-16 V	20-32 V
Undervoltage:	<10 V	<20 V
Overvoltage:	>16 V	>32 V
Quiescent current consumption	12 V ≤ 1 mA	24 V ≤ 1 mA
Acoustic special signal (DIN 14610):		
Power amplifier:		
2 loudspeakers 22 W; 8 Ω(front)	~1,7 A each	~1,7 A each
Loudspeaker 22 W; 8 Ω (rear) (only with NF):	~1,7 A	~1,7 A
Sound pressure level:	in compliance with DIN 14610	
Loads on the data outputs:		
Accident data recorder (UDS)	Tonal sequence	+ U_B, max. 400 mA
	Rotating beacon	+ U_B, max. 400 mA
Output front BSX-N		+ U_B, max. 400 mA
Output Martin compressor		+ U_B, max. 400 mA
Connection wire display control lamp		P max.= 2W

Note:
Front BSX-N and Martin compressor may only be switched via a load relay.

Replacement instructions

CAUTION!
Do not touch the bulbs with your bare fingers.

Make sure that the position of the reflectors remains unchanged with the multiple-reflector system. (Follow pictogram in KL-MR)

Changing bulbs
Example: KL-ER

If the bulbs in the rotating beacons have to be replaced, proceed as follows:

1 Remove the two screws on the lid.

2 Loosen the cover screws.

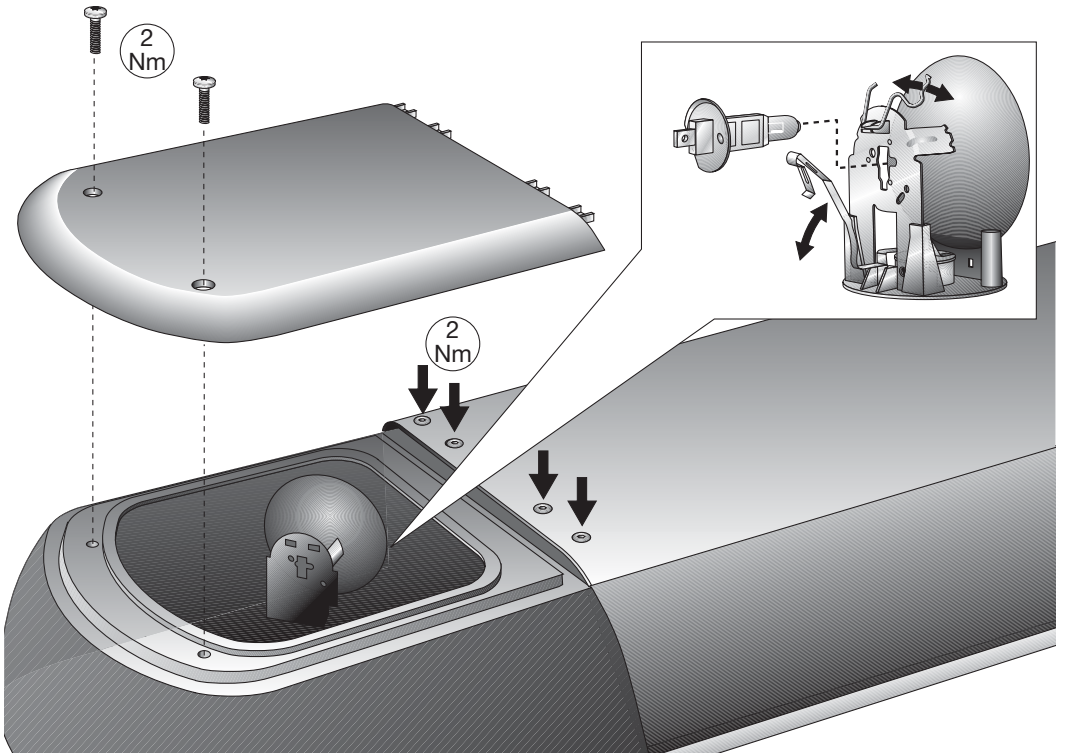
3 Remove the installation cover.

4 Pull the current contact off the bulb.

5 Loosen the clamping hoop and pull upwards.

6 Remove the bulb to the rear and replace.

7 Close again in reverse order.



Replacement instructions

CAUTION!
Do not touch bulb with bare fingers.

Replacing KL-XL2 strobe tube

1 Remove the two outer cover screws.

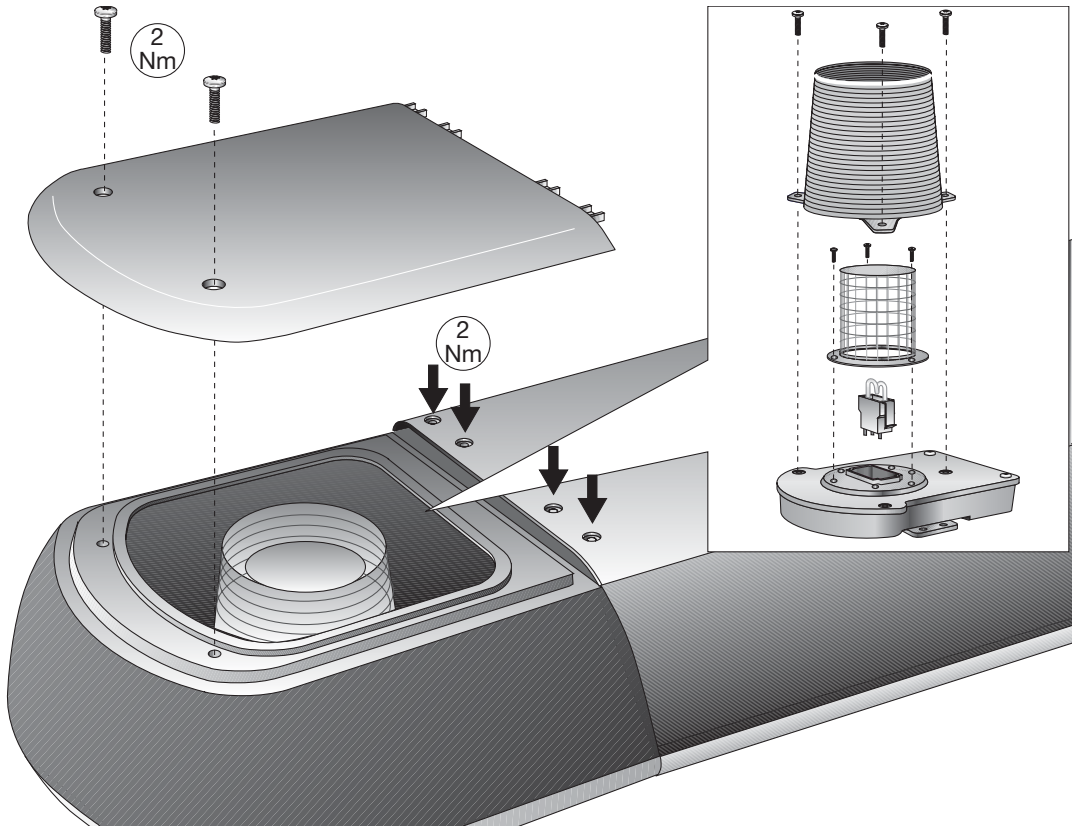
2 Loosen the inner cover screws.

3 Remove the installation cover.

4 Unscrew lens and wire grate.

5 Pull bulb out toward top and replace.

Close in reverse order



Replacement instructions

Light-source replacement (Example: LED flash module)

1 Removal of the two cover screws

2 Loosening of the four cover screws

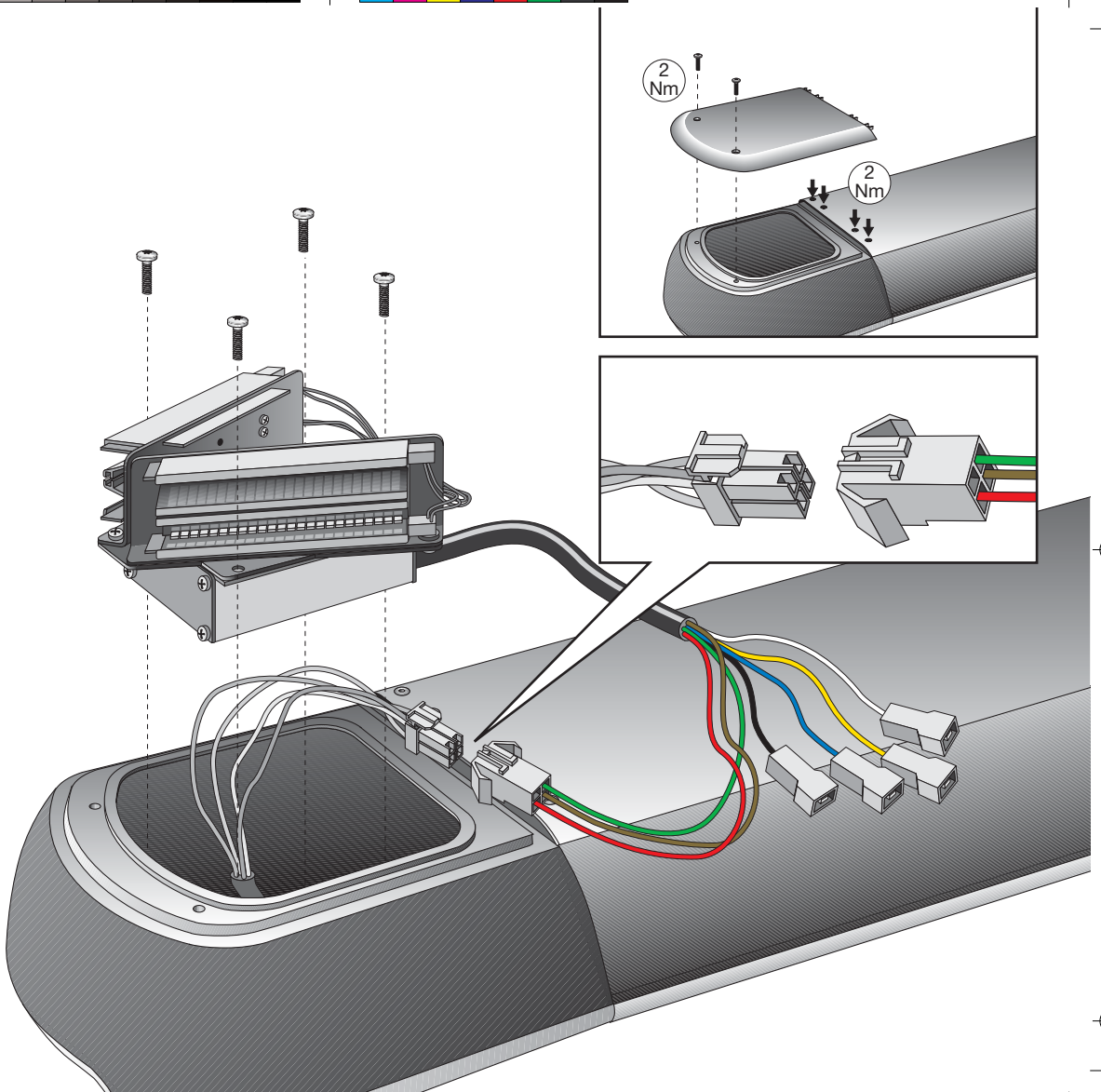
3 Removal of the assembly cover

4 Removal of the four Torx fastening screws of the LED flash module

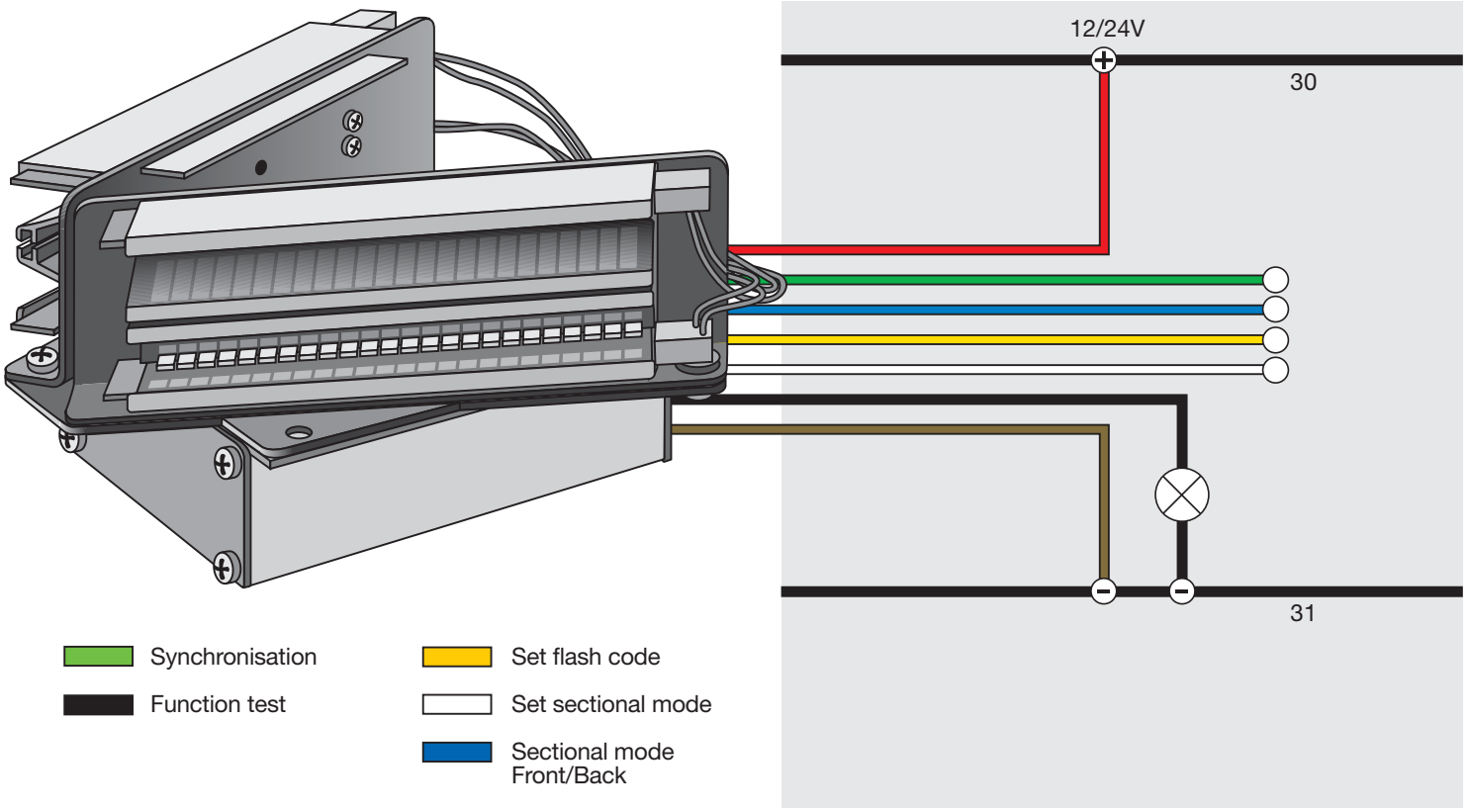
5 Unlock and disconnect the plug-connection

6 Replace the LED flash module

7 Assembly in reverse order



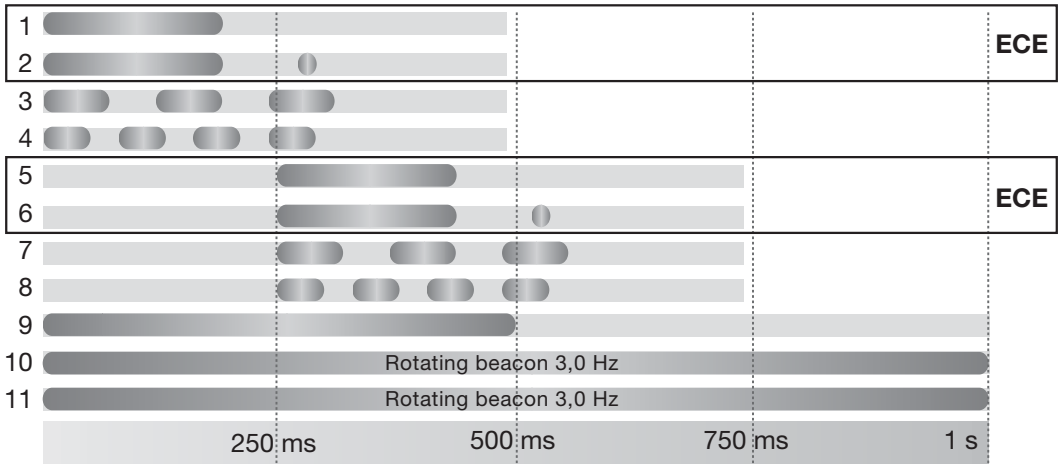
Electrical connection



Supported flash codes

We recommend that you program the beacons BEFORE they are mounted on the roof!

In programming mode, operators can choose from the eleven flash codes available. **In European countries, only beacon flash codes 1, 2, 5 and 6 are allowed.**



Selecting a flash code

1. Connect and operate the light (attach red to **plus +** and brown to **minus –**).

2. Attach input "flash code selection" (yellow) to **plus +**; do not connect input "toggle front/back" (blue).

3. After about 2 seconds, Flash Code Selection mode will be enabled; the light will start flashing at approx. 1Hz. After every flash cycle, the light will move to the next flash code, always starting with the first flash code. For example, to select flash code no. 4, wait until the 4th flash, then disconnect input "flash code selection" (yellow) from **plus +**.

Available flash codes

1. Single flash
2. Two flashes
3. Three flashes
4. Four flashes
5. Single flash (250ms offset against flash code 1)
6. Two flashes (250ms offset against flash code 2)
7. Three flashes (250ms offset against flash code 2)
8. Four flashes (250ms offset against flash code 2)
9. Single flash, 1Hz
10. Rotating beacon, 2.2 Hz
11. Rotating beacon, 3.0 Hz

Replacement instructions

Example: Alley light

1 Open the installation opening.

2 Remove the hexagonal nut of the Alley light.

3 Pull the Alley light out downwards.

4 Remove the bracket screws.

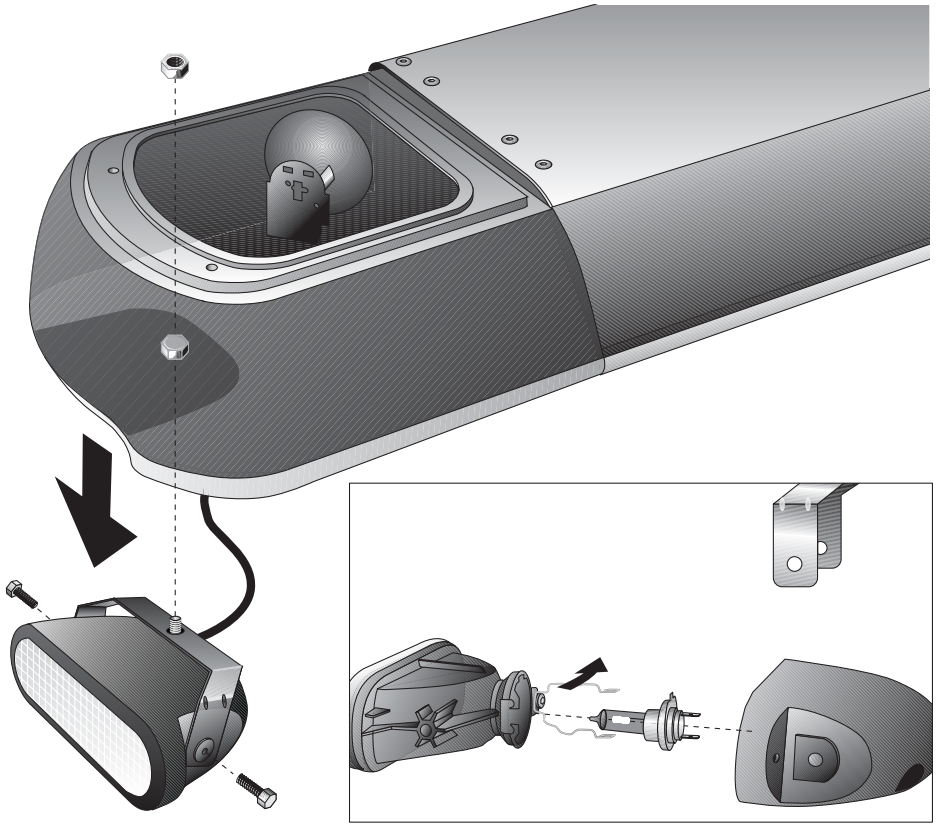
5 Remove the plastic cap.

6 Replace bulb.

CAUTION!
Do not touch the bulbs with your bare fingers.

7 Close in reverse order.

Make sure that the cable is installed correctly in the channel under the light dome and the Alley light is set as required in relation to the road.



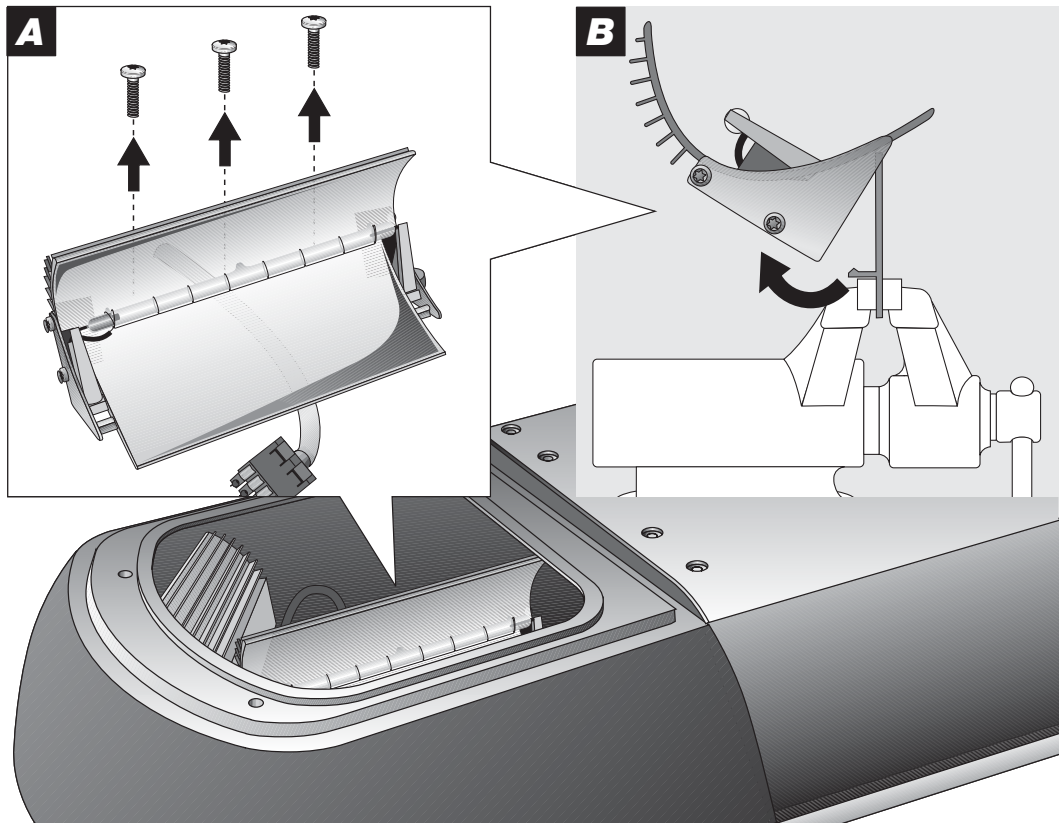
Flash-tube replacement KL-XR2

1 Opening of the mounting.

2 Removal of the fastening screws of the reflector assembly.

3 Disconnect the electrical connection.

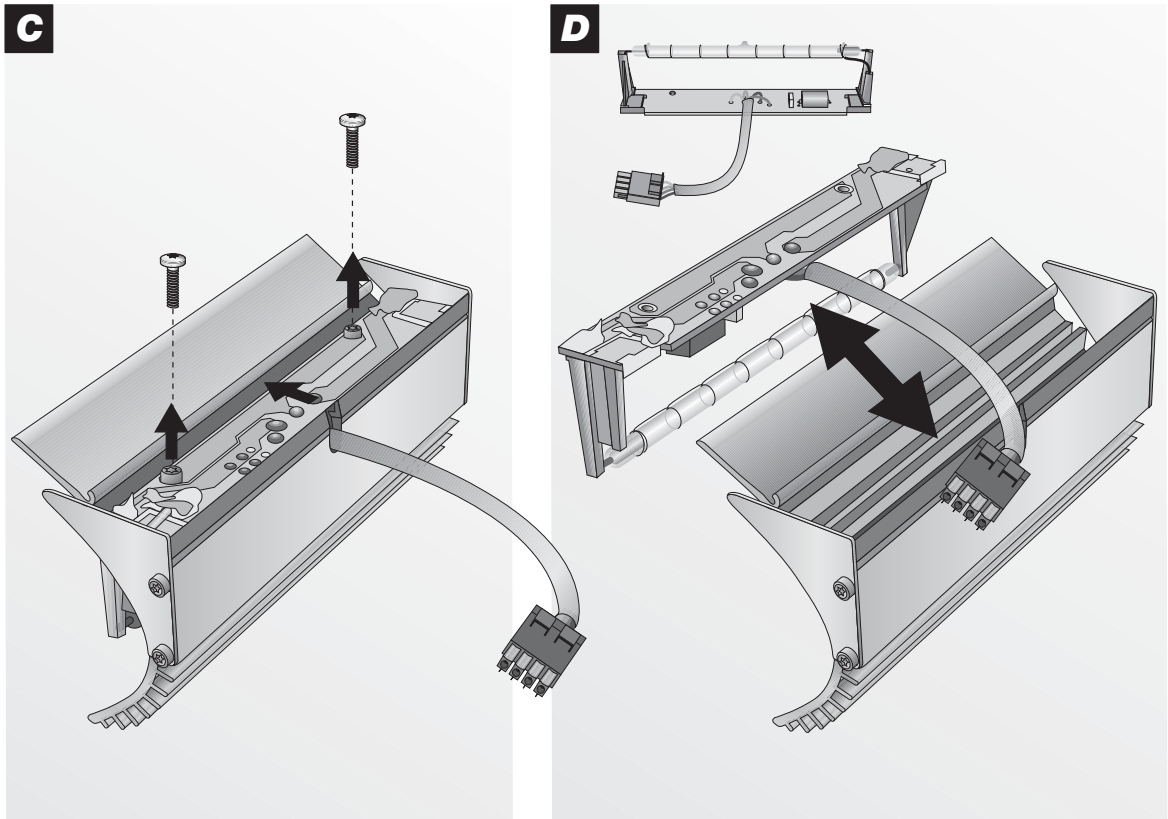
4 Tension the reflector plate in, for a example, vice, and prise the reflector from the retaining plate.



Flash-tube replacement KL-XR2

5 Remove the flash-tube screws and replace the tube.

6 Close in the reverse order.



		ECE	flashing sequences	frequenzy	flash / 2 periods									
M	**S**				0ms	245ms	330ms	375ms	490ms	660ms	735ms	750ms	990ms	1125ms
0	0	X	2	2,05 Hz	ABCD				ABCD					
1	1	X	1	2,05 Hz	ABCD				ABCD					
2	2		3	1,5 Hz	ABCD					ABCD				
3	3		4	1,33 Hz	ABCD							ABCD		
0	4	X	2	2,05 Hz	AB	CD			AB		CD			
1	5	X	1	2,05 Hz	AB	CD			AB		CD			
2	6		3	1,5 Hz	AB		CD			AB			CD	
3	7		4	1,33 Hz	AB			CD				AB		CD
8	8		2	2,05 Hz	AC				BD		BD			
9	9		1	2,05 Hz	AC				BD		BD			
A	A		3	1,5 Hz	AC					BD				
B	B		4	1,33 Hz	AC							BD		
8	C		2	2,05 Hz	A	C			B		D			
9	D		1	2,05 Hz	A	C			B		D			
A	E		3	1,5 Hz	A		C			B			D	
B	F		4	1,33 Hz	A			C				B		D

Replacement instructions

Loudspeaker replacement

1 Loosen the screws and lift off the cover.

2 Remove the hole grid.

3 Loosen two screws on the installation platform. Push the platform to the front, release it and lift it out.

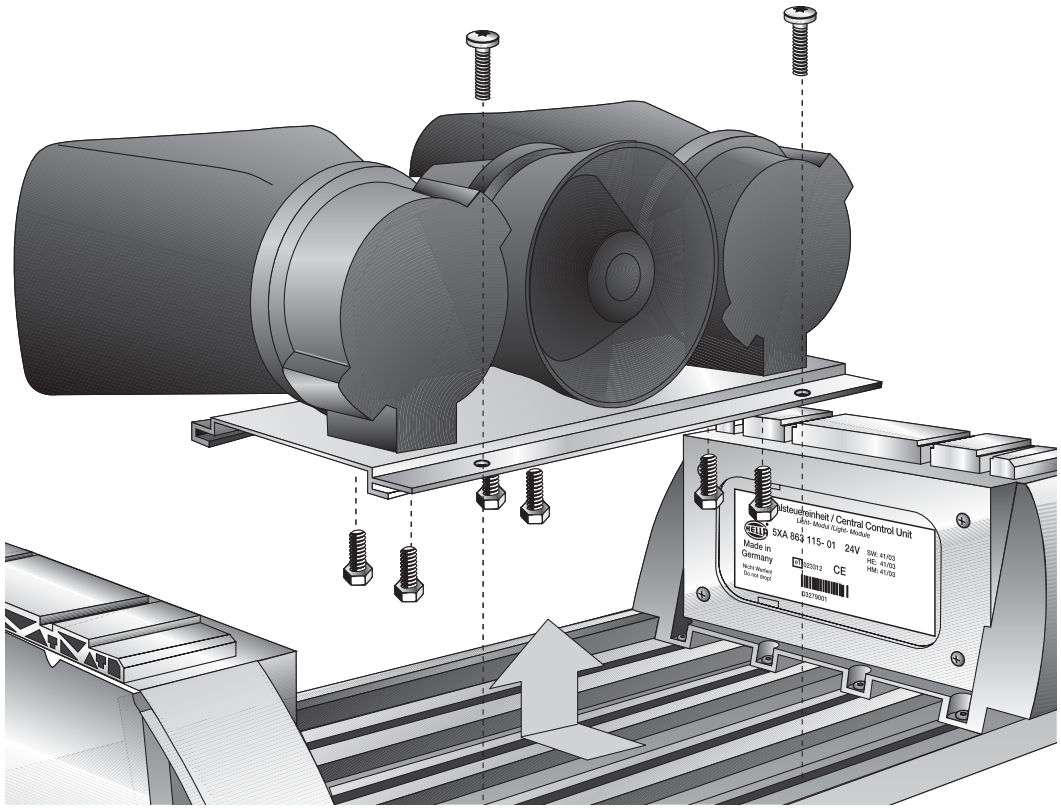
4 Loosen two hexagonal screws per loudspeaker.

5 Lift the loudspeakers

6 Unscrew the loudspeaker cable on the LA module.

7 Replace the loudspeakers.

8 Install in reverse order.



Replacement instructions

Replacing LA module and L module

1 Remove loudspeakers

2 Remove module plugs

3 Loosen four screws on the separating wall

4 Pull off the module upwards

In the case of the 1400mm length, the light dome must also be removed. Following replacement tighten the light dome screws at 1.5 Nm.