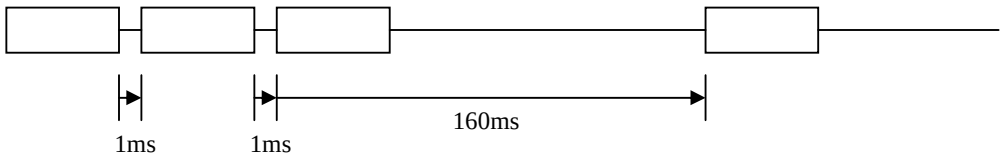
Coding

The coding of the RF signal is 4kbps Manchester coding, where a “0” is send as a transition from “carrier on” to “carrier off” and a “1” is send as a transition from “carrier off” to “carrier on”.

Packet-bursts

When sending a new packet, the first packet should be repeated three times with a delay of approx. 1ms in between followed by a new packet every 160 ms (measured from start of package to next start of package). The following illustrates this (but is not to scale)



When no more packages are to be send by a transmitter a ten-package-burst with a “end-of-packages” is send.

Structure of single packet

Every packet can be described using the following schema:

Preample	Header	ID+IDCS	Counter	Type	Data	Checksum
10 bit	“8 bit”	32 bit	4 bit	4 bit	8-64 bit	8 bit

The fields are byte-oriented and each byte is sent MSB first.

Preamble

The preamble is always 10 “0”’s to get the receiver’s amplifier to lock onto the sender.

Header

The header bits are used to uniquely identify a start of package. Every time the receiver sees this header, it will assume that a new package has begun. The header is made by using values that are not possible using the 4kbps Manchester-coding used by the data-bits.
The coding is as follows: After the last “0” of the preamble a “0” is send at $2^2/_3$kbps, then a “0” is send at 2kbps, then a “0” is send at $2^2/_3$kbps , then a “0” is send at 2kbps and lastly a “0” send at 4kbps. In time, this corresponds to 8 bits at 4kbps. (In receiver timing this is easily detectable and not possible during data-transfer).

ID+IDCS

The two fields ID and ID-checksum are to uniquely identify a specific transmitter. The IDCS is to make sure, that the ID-field is correct before waking up from lowpower-mode.
The ID-field is a 19 bit serial number and a 5 bit "series" number, which is given by Linak to a manufacturer when producing handsets. The IDCS is a CRC-8 (0xEA).
The bytes are as follows:

Byte 0	Byte 1	Byte 2	Byte 3
Serial	Serial	Series + Serial	IDCS
Bit 7-0	Bit 15-8	Bit 4-0 + Bit 19-16	Bit 7-0

Counter

Simple counter incremented in every package send. For every new packet type (when the package data is exchanged, the counter is reset to 0)

Type

This field contains the type and implicitly the length of the "Data" field.

Type	Data-length	Data-content
0	8	Same as LIN command 35 (see US 41-07-002)
1	8	Deskline commands
2	TBD	TBD
3	TBD	TBD
4	TBD	TBD
5	TBD	TBD
6	TBD	TBD
7	TBD	TBD
8	TBD	TBD
9	TBD	TBD
10	TBD	TBD
11	TBD	TBD
12	TBD	TBD
13	TBD	TBD
14	TBD	TBD
15	TBD	TBD

Deskline commands (type field = 1)

The following commands are defined for deskline:

Value	Function
0	Store
1	M1
2	M2
3	M3
4	Store+M1
5	Store+M2
6	Store+M3
7	Ref 1U
8	Ref 1D
9	Ref 2 U
10	Ref 2 D
11	Ref 3 U
12	Ref 3 D
13	Ref 4 U
14	Ref 4 D
15	Ref 5 U
16	Ref 5 D
17	Ref 6 U
18	Ref 6 D
19	Ref 7 U
20	Ref 7 D
21	Ref 8 U
22	Ref 8 D
23	Function 1
24	Function 2
25	Function 3
26	Function 4
27	Function 5
255	Stop

Data

This field is the real “payload” of the packet. It contains the instruction from the handset to the TD. The length and description of the content is described under “Type”

Packet checksum

This field is intended to verify the integrity of the entire package after the header and is a 1’s complement sum.

Total time for one packet

The total time to send one packet depends on the length of each packet from 18,50ms to 32,50ms.