

Table of contents

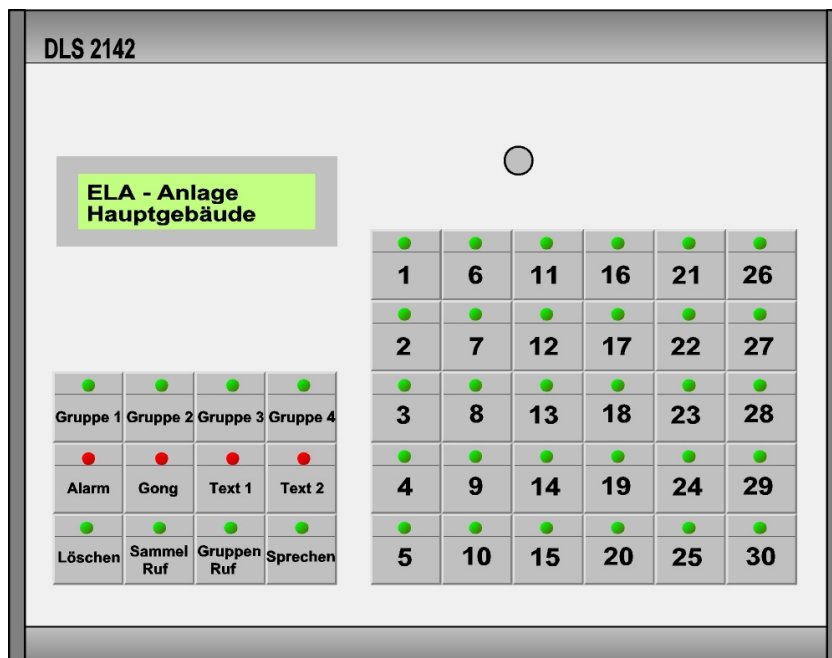
1. Introduction	2
2. Basic functions	4
2.1. The Talk key	4
2.2. The Clear key	5
2.3. Selecting lines	6
2.3.1. Selecting lines with numerical keys (DLS 2124)	6
2.3.2. Select lines by direct keys (DLS 2142)	6
2.3.3. Select lines by group keys (DLS 2108 to 2112)	7
2.3.4. Selecting groups of lines (DLS 2104)	7
2.4. General paging (key All)	7
3. Additional selections	8
3.1. Selecting group of lines (key "Group 1")	8
3.2. Selecting group of lines (key "Groups")	8
3.2.1. Programming of groups at the paging station	9
4. Alarm procedures	11
5. Program	13
5.1. Selection for program	13
5.1.1. Single program technique	13
5.1.2. Multi program technique	14
5.2. Volume control of lines with program	14
6. Other functions	15
6.1. Switching the PA system on and off (key "System on")	15
6.2. Switching the pregong on and off (key "Pregong on")	15
6.3. Test mode (key "Test")	15
6.4. Intercom function	16
6.5. Control loudspeaker	16
7. Fault messages	17
Index	19
Test routine of the digital paging stations	21
Update the software installed	23

1. Introduction

The digital paging stations of the DLS 2100 family may be divided up into 3 main types. The first type has a numerical block, lines requested may be selected numerically. For the second type lines are selected by direct paging keys. The third type comprises lite-paging stations.



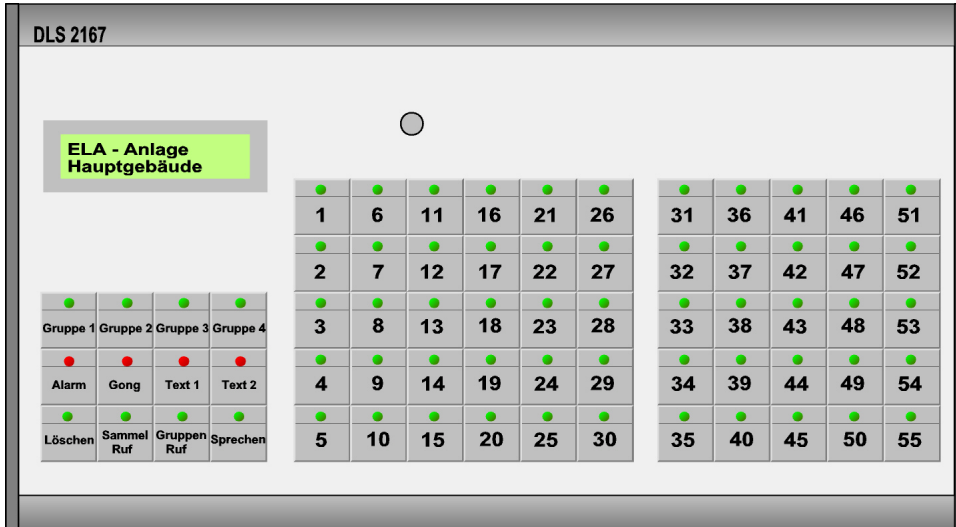
paging stations with numerical keys



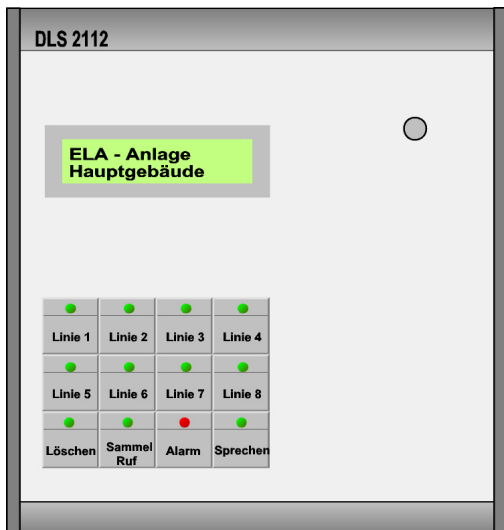
paging stations with direct paging keys

The following description gives an overview concerning the disposable functions of digital paging stations. Not all of these functions may be applied for all paging stations, it depends on the enlargement state of the entire system which will be made to customer's specification.

There are bigger versions of the DLS 2142 available. The picture shows a DLS 2167 with 25 more selection keys.



The keys are direct line keys, group keys and/or function keys. The group keys can be programmed from the main system with one or more line numbers. For paging stations without display there are two LED's to show the state of the stations. There is a green LED if the system is ready for use, and a red one if it is occupied. There is a connection to the main system as long as the green LED is lighted permanently. If power supply of the paging station is working, however, there is no connection to the main system, the green LED is flashing.



lite-paging stations

2. Basic functions

2.1. The Talk key

The key **Talk** is existing on all paging stations except on DLS 2104. It is necessary for announcements and switches the microphone on. *announcements*

To make an announcement, first select the requested lines (*selection see numerical keys respectively direct paging keys*). The display shows for example:

**select line:
L01 L02**

Now please press and hold the key **Talk**. The lines selected are displayed as well as the pregong (*only if a pregong is available for the system*).

**pregong running.
L01 L02**

During the running pregong, the microphone channel is not opened. The LED of the microphone key is switched out. When the pregong is finished, the announcement is shown in the display and the LED is switched on. *pregong running*

**announcement
L01 L02**

To end the announcement, please release the key **Talk**. The lines remains selected by the paging station, further announcements may be made for the same lines. To reset the paging stations to the basic state, please press **Clear**.

As different stations of a system may have different priorities, the present announcement may end others if it has a higher priority. In case of lower priority the user receives a message telling that the system is busy by another paging station. *priorities of the paging stations*

The error tone may be switched off by pressing **Talk** as well. This tone is only to catch attention in connection with error messages which can be displayed. To switch these tone on respectively off, please press **Talk** when the station is in its basic function. For a short while the display shows the present state. *quit the error tone*

error tone off

2.2. The Clear key

The key **Clear** resets the paging stations to the basic state or cancels current procedures. It is also possible to end the alarm procedure of other paging stations if the priority of the present station is higher. Some current alarm procedures once started may not be ended from the paging station. They are automatically ended by the system.

If a selection is made or another function called, the LED of the key **Clear** is lighted. This shows that the basis state of the paging station has been quit.

If there are any errors in existence, the LED of the Clear key flashes if the paging station is in the idle state.

As a special function the key **Clear** switches off the error tone signal when there is no connection to the main system due to a system failure. The paging station displays a corresponding message and, in addition to that, initializes the signal. By pressing **Clear**, this tone may be turned off.

2.3. Selecting lines

2.3.1. Selecting lines with numerical keys (DLS 2124)

Selection via numerical keys can be of one, two or three figures. It depends on the enlargement of the system. If a numerical key is pressed when the paging station is in its basic state, the display shows the selection made: *select lines*

```
select line:  
L01
```

In our example, the line 01 has been selected. The letter **L** shows that a line selection has been made. A **G** for example shows that a group has been chosen. It depends on the configuration and the possibilities of the paging stations (*see group selection*).

Further selections can be made. If the lines of the display are completely filled, only the last inputs are displayed. If a line is shown which is not existing in the system or which cannot be selected, a corresponding fault message is displayed for a short while, the last input is cancelled.

If a line shall be deleted from the present selection, this may be done by typing the same line number again. The line display will then be newly assorted, the line deleted is no longer in the selection. Groups once set, however, will not be deleted in the case of group selection. By this, unwanted cancellation of lines already programmed in another group is avoided. If a group shall be deleted, the entire selection has to be cancelled and newly set. *remove selected lines*

2.3.2. Select lines by direct keys (DLS 2142)

Selection is made by direct paging for stations without numerical keys. Normally, they are only marked with line numbers, for example 1 to 30. In this case a line or group is related to each direct key.

It is displayed if one of these keys is pressed. In addition to that, the key LEDs show the lines set.

```
select line:  
L01 L02
```

If a line shall be deleted from the present selection, please press the direct key again. *remove selected lines*
Line display will then be newly assorted, the line deleted is no longer part of the selection.

2.3.3. Select lines by group keys (DLS 2108 to 2112)

Lite-paging stations DLS 2108 and DLS 2112 are selecting similar to direct keys. The 4 to 8 upper keys on the keyboard are group keys. One or more lines may be related to these groups. Relation is programmed from the main system. If one of these keys is pressed, meaning a group has been selected, the corresponding LED is lighted. To delete a (group-)selection, the entire selection has to be cancelled.

2.3.4. Selecting groups of lines (DLS 2104)

Lite-paging stations DLS 2104 only dispose of 4 group keys. If one of these keys is pressed, the corresponding group is selected, the announcement is initialized. By releasing the key, the selection is automatically reset, the paging station returns to the basic state.

2.4. General paging (key All)

By pressing **All** a general selection of all lines is made. The display of the paging station shows the following message:

```
select line:  
general paging
```

If other lines have been selected before, they are no longer displayed as they are part of the general selection.

3. Additional selections

3.1. Selecting group of lines (key "Group 1")

If the station has keys marked group 1 to group x, lines connected to groups may be selected. Selection may be made at the same time as a selection of lines. The display shows: *direct group keys*

```
select line:  
G1
```

The letter **G** shows that a group has been selected. Independent of a line selection, the group selection will be displayed in one, two or three figures.

3.2. Selecting group of lines (key "Groups")

Stations having numerical keys as well as a key **Groups** can switch between line and group selection. If, for example, the line 01 has been already chosen, however, afterwards the key **Groups** is pressed, the display shows: *switch to group selection*

```
select group:  
L01
```

The display shows that the input following will be a group selection. If group 3 is selected afterwards, it will be displayed. When the input is finished the station is automatically reset to the line selection.

```
select line:  
L01 G3
```

Independent of line selection, group selection is displayed in one, two or three figures.

In contrast to line selection a group once set is not reset by dialling the group again. Unwanted cancellation of lines being part of other groups is avoided by this function. If a group shall be deleted, the entire selection has to be cancelled and newly set. *remove selected groups*

3.2.1. Programming of groups at the paging station

By pressing **Groups**, the stations' groups may be changed respectively set. This function is optional, for that reason it is not available at all paging stations.

If **Groups** is pressed for approximately 10 seconds, the groups may be programmed. A programmer's code is necessary. When it has to be fed in, the display shows:

```
programming code
code      :
```

The code must have four figures. During the input the sign * is displayed. *(The code may be programmed at the main system and cannot be changed from the paging station.)*

*programming
code*

Afterwards the group number to be programmed has to be dialled. The display shows:

```
group number
(i.e. 4)
```

The figure used as example indicates whether the numbers have to contain one, two or three figures. After a group number has been set, the display shows all lines presently set. If no group is available for the number selected, the display shows:

*enter group
number*

```
group empty
          |_
```

If the group is already existing, the lines will be displayed.

```
←02 03 04 05 06
07 08 09 10 11 |_
```

Input is made on the right side where the cursor is flashing. The field's size shows whether line numbers have to be out of one, two or three figures. An arrow placed on the left or the right side of the line number indicates that there are further lines in this group. Contents of the display may be moved by pressing the **Talk** key. Further lines are programmed via numerical or direct keys. If a line shall be deleted, please feed the number again.

*enter line
numbers*

To save a group, please press **Groups**. For a short while the display shows:

**saving group
please wait...**

*exit program-
ming of groups*

If input shall be quit without modifications, please press **Clear**.

If all lines belonging to one group have been deleted, the group is deleted after saving. If a group is called, however, the table does not contain any lines (*a non existing group*), the group will be set if it contains lines when the group was saved.

Important: These groups may either be valid generally for all lines or just for one paging station. This is determined upon setting the group. If a new group is programmed from the main system, it may be chosen for which station(s) this group will be valid. If a new group is programmed from a paging station, it is only valid for this specific station.

If a group shall be changed from the main system, you may choose as well for which station(s) this group will be valid. When changing from a station, its own group, if existing, will be changed. If no group especially set for this station is present, the group valid for all paging stations will be modified. If the group to be modified is not existing, it will be set.

4. Alarm procedures

Alarm procedures and similar functions are related to one special key at the paging station. As procedures may vary according to the case, control is effected via display. Keys are usually marked with descriptions such as alarm, fire alarm, signal, text, gong and so on. Following different procedures are described. They do not necessarily have to apply for the present paging station.

*multiple forms
of an alarm
procedure*

In most cases it is possible, sometimes absolutely necessary, to select lines requested for this procedure. If the procedure key is pressed afterwards, it will only be applied for the lines chosen. Other procedures automatically release general paging. This is also valid for some procedures if previously no selection has been made. Other procedures require previous selection and automatically display a corresponding message for the user.

*select area for
procedure*

After the selection the procedure will be executed. In most cases an alarm may only be released after activities described hereafter in order to avoid unwanted alarms. In the most simplest case the procedure key has to be pressed twice for confirmation. By means of a corresponding message the user is informed about this necessity.

*confirm proce-
dure start*

**Alarm
please confirm**

After confirmation the alarm is released.

By means of a key switch at the paging station it is guaranteed that only authorized users release alarms. If the key switch has not been used, the display shows:

*alarms with
key-switch*

**key-switch
locked**

If it has been switched on the procedure may start.

Besides general keys, some paging stations dispose of a **Security key**. It has to be pressed as well in order to release the function. If this step is not executed, the display shows:

*alarms with an
additional
security key*

**key security
not pressed**

After the function has been released, the display shows the course:

**Alarm
general paging**

Other procedures run for a specific time. This is displayed as well:

**Gong
runs (10 sec)**

To quit a procedure, please press **Clear**. If the priority of the present paging station is higher, it may end procedures of other stations. However, some procedures may not be ended manually as they run for a determined time. In this case only the signal is turned off.

Clear an alarm

Other procedures may be terminated by pressing **Talk**, for example to execute an announcement after the signal. The display shows:

*from alarm to
announcement*

**Alarm-paging
general paging**

After the key **Talk** is released the paging station returns to the selection mode.

5. Program

Lines may be set by pressing **Program**, for example music programmes may be started by pressing this key. As "Program" is an optional function, it is not available for all systems.

function of the "Program"

5.1. Selection for program

Selection menu for program setting is not available for all paging stations. It is only existing if, besides program setting the option "volume regulation for programme lines" is installed. Otherwise programme setting is directly reached by pressing **Program**.

If the option "volume regulation" is installed, the selection menu is displayed after pressing **Program**.

- 1 Program lines
- 2 Volume

By using the numerical keys or the direct keys 1 and 2 the corresponding menu is selected.

select a menu item

5.1.1. Single program technique

When using single program technique, program and announcements can only use one single transmission channel together but not at the same time. Due to this fact, program lines will be switched off during an announcement or alarm. When the announcement is ended, program lines are turned on again (*see 5.2*).

Programme changes may be made either from the basic position of a paging station or during a selection. When **Program** is pressed, the present settings are displayed. The key **Program** is lighted as long as the programming mode is set. If no lines for this program are set, the display shows:

alter a program

no lines set

If lines have been set already, they are displayed:

```

←02 03 04 05 06
07 08 09 10 11 |

```

Input will be displayed behind the vertical line in the right field. The size of the field shows whether line numbers have to be out of one, two or three figures. An arrow to the left or right side of the line numbers show that further lines have been set. The display may be moved by pressing **Talk**. Further lines may be set respectively changed by pressing numerical or direct keys as well as group keys. If a line shall be deleted, please feed the number again.

To quit the programming mode, please press **Program**. Settings are saved, lines for program are set.

5.1.2. Multi program technique

For the "multi program technique", separate transmission channels are at disposal for programmes and announcements. For that reason, not all programme lines have to be switched off for announcements or alarms. In contrast to techniques for one single program, only lines affected by the announcement have to be shifted.

Set lines for multi program techniques as described under 5.1.1.

5.2. Volume control of lines with program

By volume regulation the total volume of programmes (*for example background music*) is regulated. Program volume has no influence on the volume of announcements and alarms. Present settings are displayed when volume regulation is selected in the menu.

```

program volume:
===== _ _ _ 6

```

*volume of a
music-pro-
gram*

By pressing numerical or direct keys 1 to 9 program volume may be regulated. To quit this mode, please press **Program** or **Clear**.

6. Other functions

6.1. Switching the PA system on and off (key "System on")

With this function the PA-main system may be switched on or off from one paging station. If the system is switched off it is in STAND-BY mode. The display shows: *main system with idle mode*

PA-system off

Please switch on the system by pressing **System on** to make announcements or to execute other functions. The key LED shows the present state of the system.

6.2. Switching the pregong on and off (key "Pregong on")

By pressing this key the pregong may either be turned on or off from a paging station. If it is switched off, the pregong will not appear in case of announcements. Each use of this key will be displayed:

**Pregong
off**

or

**Pregong
on**

The key LED always shows the present state concerning the pregong.

6.3. Test mode (key "Test")

The test mode is necessary for maintenance works. When it is switched on the paging station may be used as usual. However, no signal will be transmitted via loudspeakers. *maintenance at the main system*

Important in case of alarms: Even if test mode are initialized, several alarm procedures have the possibility to set lines without using the digital main system, therefore they will transmit a signal via the loudspeakers. The present state of the test mode will be displayed by a corresponding message as well as by the key LED.

6.4. Intercom function

With this function a connection is initialized between two paging stations. A control loudspeaker has to be available at each station. For this function a paging station has to have one or more intercom keys which will be marked correspondingly.

If in the basic state of the station a key **Intercom** has been pressed. The display shows:

```
select intercom:  
pag. station 2
```

By pressing **Talk** the paging station can contact the station wanted for calling (in our case station 2). The display shows:

```
intercom  
pag. station 2
```

If the key **Talk** is released at the first station, the station called can answer by pressing **Talk**. The display shows for example:

```
intercom  
control station
```

To end this function **Clear** has to be pressed at one of the stations.

6.5. Control loudspeaker

Via loudspeakers integrated in the paging station, signals may be monitored in case of alarms. In case of the test mode, all signals are transmitted via this loudspeaker. Volume may be regulated by a volume control at the paging station.

7. Fault messages

Fault messages are divided into system faults and external fault messages. In addition to that the system transmits messages in case of user errors.

User errors:

invalid paging : A line has been chosen which is not at disposal.

invalid group : The group chosen is not at disposal.

wrong input : The line chosen has not be fed entirely. For example, only two figures have been fed, however, three would be necessary.

table contains invalid lines : A group table or the general paging table contains lines which are not disposable.

groups not allowed : Group selection has not been defined for this paging station.

invalid code : The code used does not correspond with the one programmed.

keys Clear, groups, Talk : user information about the keys allowed within group programming

system busy by pag. station 01 : The function selected can not be executed as it is occupied by a station with higher priority.

PA busy by pag. station 01 : The system may not be turned off by pressing **System on** as it is occupied by another station at present.

no lines selected : Lines for this procedure (*for example an alarm*) have to be selected previously.

procedure not defined : A procedure not available at this paging station has been chosen.

key-switch locked : To start the procedure selected, the key switch has to be unlocked before.

key security not pressed : To release the procedure selected, please additionally press the **Security** key.

clear prior switching off : At present, the system may not be turned off by pressing **System on** as it is used by the present paging station.

press System on : Before the function selected may be executed the system has to be switched on by the **System on** key (only for systems without automatic switching).

PA-system not powered up : System could not be initialized by automatic switching.

test mode system inactive : Maintenance works are active within the system. Paging station do not work presently.

messages during operation

System errors:

- no response pag. station 03** : The main station does not receive data from the paging station (03). *fault messages requiring service*
- Error: RAM size to low** : Tables for groups or general paging exceed the RAM capacity.
- Test-key active** : This message only shows that the test mode has been initialized by an external key.
- PA active please wait...** : During current PA activities, it has been tried to call the menu. As the menu stops all other functions, it can only be initialized if the system is in normal idle position.

External fault messages:

External fault messages are discovered by inputs of the I/O card. They have no effect on the controlling. They will only make the error known to the user.

- amplifier break** : Breakdown of one or more amplifiers of the PA system.
- mains failure** : failure of the usual power supply. The system now works by battery.
- battery failure** : The battery has failed. In connection with a general power failure it is no longer assured that the PA system works as a security system!
- network error** : It displays an error in the network of the speaker lines. *(Will be transmitted from the line control DLS 2300)*
- earth fault** : An earth failure has taken place in the speaker network. *(Will be transmitted from the line control DLS 2300)*
- speaker error** : One or more speaker do not work as they should. *(Will be transmitted from the line control DLS 2300)*

Index

A

Additional selections 8–10
alarm procedure 5
Alarm procedures 11–12
All (key) 7
announcement 4

B

Basic functions 4–7
Clear key 5
direct keys 6–7
General paging 7–8
numerical keys 6
Talk key 4

C

Clear key 5
control loudspeaker 16

D

direct paging keys 6–7
DLS 2100 2

E

error tone 4
External fault messages 18

F

Fault messages 17–18

G

General paging 7–8
Gong. *Siehe* Alarm procedures

I

Introduction 2–3

K

key switch 11

L

lite-paging stations 2, 7

M

maintenance works 15
Multi program technique 14

N

numerical keys 6

O

Other functions 15–16

P

Pregong on (key) 15
priority 4
Program 13–14
programming code 9
Programming of groups 9–13

S

Security key 11
Selecting groups 6
with key Group 1 8
Selecting lines
with direct keys 6–7
with numerical keys 6
Selection for program 13
Single program technique 13–14
System errors 18
System on (key) 15

T

Talk key 4
Test (key) 15
test mode 15

U

User errors 17

V

volume control 16
Volume control of lines with programm 14–15

customer:		Distribution of lines			
line	area	line	area	line	area
01		21		41	
02		22		42	
03		23		43	
04		24		44	
05		25		45	
06		26		46	
07		27		47	
08		28		48	
09		29		49	
10		30		50	
11		31		group	area
12		32		01	
13		33		02	
14		34		03	
15		35		04	
16		36		05	
17		37		06	
18		38		07	
19		39		08	
20		40		09	

Test routine of the digital paging stations

The main functions of the digital paging station are testable with this feature. Access is made via the "0" key (*paging stations with numerical keys*) or via the direct paging key "10" (*paging stations with direct paging keys*). Please press the corresponding key quick 4 times in a row. The display shows the first menu item of the test routines.

```
test routines ↔  
test keys
```

To scroll through the menu items please use the keys 1 and 3 (*if numerical keys available*) or the direct paging keys 1 and 11 (*if only direct paging keys available*). To select a menu item please use the numerical key 2 or the direct paging key 6. If the "Test keys" menu is chosen, the display shows:

```
test keys  
key : 00
```

The displayed number corresponds to the last key pressed. Every key has its own key-code.

The next menu item is used to test the build in LEDs. If this menu item is chosen, the display shows:

```
LED test  
LED on
```

When the test has been started, the display message changes from on to off and vice versa in the same way as all the LEDs are flashing. To cancel this test press any key.

The next test is used for testing the displays function. During this test a pattern is shifted along the display. At the end of this test, the signal tone is heard 3 times in a row. This tests the build in piezo-tone.

The next test item is used to check the serial link. When it was started the display shows: *test of the serial link*

```
serial test
send:000recv:000
```

If a key is pressed, his key-code is send to the main system and the send-counter is incremented by the number of data-bytes sent. If the paging station receives correct data from the main system, the receive-counter is also incremented by the number of data-bytes received. **Important:** Every key pressed is sent to the main system with its original key-code. This means that every key is evaluated by the main system and so can start an alarm or anything else. To avoid this please use only the Clear key or other uncritical keys.

The last menu item is to exit the test menu. During some running test a help text is displayed in the first row of the display. *Cancel the test routines*

Update the software installed

In rare cases it is necessary to update the installed software version to get new features. To do this some hints should be noticed.

Installation:

1. Disconnect paging station to put it out of order.
2. Open side cover plate. Remove wire from wire holder. Move front plate sideways to remove it from the main housing. Attend not to damage any circuits.
3. Use a screwdriver or any similar tool to remove the old Program-EPROM. Attend not to damage any other circuits.
4. Regard the correct orientation of the newly inserted EPROM. The notch of the EPROM must point at the same direction as the same-sized circuit beside (*see sketch*). A wrong inserted EPROM will be damaged!
5. Move front plate back into main housing. Be careful not to damage any other circuits or parts inside.
6. Close side cover plate and connect paging station.

